Development and preliminary evaluation of a self-management programme for people with non-specific chronic low back pain in rural Nigeria

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Development and preliminary evaluation of a self-management programme for people with non-specific chronic low back pain in rural Nigeria

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Abstract

Background: There is currently no access to effective treatment of low back pain (LBP) in rural Nigeria despite its significant burden in this context. This increases disability, deepens poverty, and reinforces rural-urban inequality. Evidence from developed countries suggests that psychosocial factors are associated with chronic low back pain (CLBP) disability, but no research has examined these factors in rural Nigeria. This PhD aims to explore the biopsychosocial factors associated with CLBP disability in rural Nigeria, and then develop and test the feasibility of an intervention to address them.

Methods: Six studies were conducted as part of this PhD. Two qualitative studies to explore the experiences of people living with CLBP (Study 1), and the management of CLBP (Study 2) in rural Nigeria. The cross-cultural adaptation and psychometric testing of measures to assess any suggested biopsychosocial factors (Study 3). A cross-sectional survey to investigate the biopsychosocial factors associated with CLBP disability in rural Nigeria (Study 4). A systematic review to assess the intervention components to improve acceptability of exercises and physical activity behaviour in people with chronic non-communicable diseases in Africa (Study 5). The development of an exercise-based self-management programme (SMP) to target biopsychosocial factors associated with CLBP disability in rural Nigeria, and then conduct a feasibility study of this programme (Study 6).

Results: Study 1 found maladaptive beliefs and coping strategies, emotional distress and disability among individuals with CLBP. Study 2 showed that CLBP was predominantly managed within a biomedical model. Study 3 found that the adapted measures were reliable and valid for use in rural Nigeria. Study 4 showed that psychosocial factors explained 63% and 49% of the variance in self-reported and performance-based CLBP disability respectively. Study 5 suggested that behavioural rehearsal/practice, habit formation, and restructuring the physical and social environment improved the acceptability of exercises, and physical activity behaviour. Study 6 found that the SMP was feasible and acceptable to participants, and had potential in terms of clinical (biopsychosocial) outcomes.

Conclusions: This PhD has enabled the identification of the biopsychosocial factors associated with CLBP disability in rural Nigeria, and the development of a novel intervention that shows promise in addressing them.
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<tbody>
<tr>
<td>ACT</td>
<td>Acceptance and Commitment Therapy</td>
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<tr>
<td>B</td>
<td>Unstandardised Beta</td>
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<tr>
<td>BCT</td>
<td>Behaviour Change Technique</td>
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<tr>
<td>BDM</td>
<td>Biomedical, Dentistry, Medicine, Natural &amp; Mathematical Sciences</td>
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<tr>
<td>BIPQ</td>
<td>Brief Illness Perception Questionnaire</td>
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<tr>
<td>BPS</td>
<td>Back Performance Scale</td>
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<td>BS-11</td>
<td>Eleven-point Box Scale</td>
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<tr>
<td>BT1</td>
<td>First back translated self-report measure (English)</td>
</tr>
<tr>
<td>BT2</td>
<td>Second back translated self-report measure (English)</td>
</tr>
<tr>
<td>CBR</td>
<td>Community Based Rehabilitation</td>
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<tr>
<td>CBT</td>
<td>Cognitive Behavioural Therapy</td>
</tr>
<tr>
<td>CDC</td>
<td>Centre for Disease Control</td>
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<tr>
<td>CHEW</td>
<td>Community Health Extension Worker</td>
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<tr>
<td>CHO</td>
<td>Community Health Officer</td>
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<tr>
<td>CHW</td>
<td>Community Health Worker</td>
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<tr>
<td>CI</td>
<td>Confidence interval</td>
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<tr>
<td>CLBP</td>
<td>Chronic Low Back Pain</td>
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<tr>
<td>CSQ</td>
<td>Coping Strategies Questionnaire</td>
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<tr>
<td>DBP</td>
<td>Diastolic Blood Pressure</td>
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<tr>
<td>Df</td>
<td>Degree of freedom</td>
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<tr>
<td>DM</td>
<td>Diabetes Mellitus</td>
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<tr>
<td>EARS</td>
<td>Exercise Adherence Rating Scale</td>
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<tr>
<td>EFA</td>
<td>Exploratory Factor Analysis</td>
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<td>f²</td>
<td>Regression effect size</td>
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<td>FABQ</td>
<td>Fear Avoidance Beliefs Questionnaire</td>
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<td>FABQ-PA</td>
<td>Physical Activity subscale of FABQ</td>
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<td>FABQ-W</td>
<td>Work subscale of FABQ</td>
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GCE  General Certificate of Education
GP   General Practitioner
GRADE Grading of Recommendations Assessment, Development and Evaluation
HADS Hospital Anxiety and Depression Scale
HADS-A Anxiety subscale of HADS
HADS-D Depression subscale of HADS
HbA1c Fasting Glycated Haemoglobin
HBP High Blood Pressure
ICC Intra-class Correlation Coefficient
ICF International Classification of Functioning, disability and health
IM Intervention Mapping
IRT Item Response Theory
IVD InterVertebral Disc
JCHEW Junior CHEW
K Kappa statistic
KMO Kaiser Meyer Olkin
LBP Low Back Pain
LGA Local Government Area
MCID Minimal Clinically Important Difference
MDC Minimal Detectable Change
MI Motivational Interviewing
MMAT Mixed Methods Appraisal Tool
MRI Magnetic Resonance Imaging
MSPSS Multidimensional Scale of Perceived Social Support
NCD Non-Communicable Disease
NECO National Examinations Council of Nigeria
NICE National Institute for Health and Clinical Excellence
O-level Ordinary level
OR Odds Ratio
ORFQ Occupational Risk Factor Questionnaire
Q-Q Quantile Quantile
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>r</td>
<td>Pearson’s correlation coefficient</td>
</tr>
<tr>
<td>R</td>
<td>Reliability</td>
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<tr>
<td>$R^2$</td>
<td>Fitted regression line</td>
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<tr>
<td>RCT</td>
<td>Randomised Controlled Trial</td>
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<tr>
<td>RHR</td>
<td>Resting Heart Rate</td>
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<tr>
<td>RMDQ</td>
<td>Roland Morris Disability Questionnaire</td>
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<tr>
<td>RPE</td>
<td>Rating of Perceived Exertion</td>
</tr>
<tr>
<td>$r_s$</td>
<td>Spearman’s correlation coefficient</td>
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<tr>
<td>SBP</td>
<td>Systolic Blood Pressure</td>
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<tr>
<td>SCT</td>
<td>Social Cognitive Theory</td>
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<tr>
<td>SD</td>
<td>Standard Deviation</td>
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<tr>
<td>SEB</td>
<td>Standard error of Beta</td>
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<tr>
<td>SEM</td>
<td>Standard Error of Measurement</td>
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<tr>
<td>SM</td>
<td>Self-Management</td>
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<tr>
<td>SMP</td>
<td>Self-Management Programme</td>
</tr>
<tr>
<td>SPSS</td>
<td>Statistical Package for the Social Sciences</td>
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<tr>
<td>SRM</td>
<td>Self-Regulatory Model of illness cognitions by Leventhal and colleagues</td>
</tr>
<tr>
<td>SUA</td>
<td>Serum Uric Acid</td>
</tr>
<tr>
<td>t</td>
<td>Student’s t-test</td>
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<tr>
<td>T1</td>
<td>First forward translated self-report measure (Igbo)</td>
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<td>T2</td>
<td>Second forward translated self-report measure (Igbo)</td>
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<tr>
<td>T2DM</td>
<td>Type two diabetes mellitus</td>
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<tr>
<td>TC</td>
<td>Total Cholesterol</td>
</tr>
<tr>
<td>TENS</td>
<td>Transcutaneous Electrical Nerve Stimulation</td>
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<tr>
<td>TPB</td>
<td>Theory of Planned Behaviour</td>
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<tr>
<td>TTM</td>
<td>Trans Theoretical Model</td>
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<tr>
<td>UK</td>
<td>United Kingdom</td>
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<tr>
<td>UNTH</td>
<td>University of Nigeria Teaching Hospital</td>
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<tr>
<td>USA</td>
<td>United States of America</td>
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<tr>
<td>VAS</td>
<td>Visual Analogue Scale</td>
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<td>Abbreviation</td>
<td>Description</td>
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<tr>
<td>VIF</td>
<td>Variance Inflation Factor</td>
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<tr>
<td>VO(_2) max</td>
<td>Maximal Oxygen uptake/aerobic capacity</td>
</tr>
<tr>
<td>WASC</td>
<td>West African School Certificate</td>
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<tr>
<td>WHO</td>
<td>World Health Organisation</td>
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<tr>
<td>WHODAS</td>
<td>World Health Organisation Disability Assessment Schedule</td>
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<tr>
<td>(\alpha)</td>
<td>Internal consistency</td>
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<tr>
<td>(\beta)</td>
<td>Standardised Beta</td>
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Dedication

To ‘I AM WHO I AM’
I am forever indebted to my mum, for her unconditional love, sacrifices and unwavering support throughout my life. I appreciate my late dad from whom I learnt to invalidate ‘you cannot’ with persistent hard work; my husband for doing the laundry, cleaning and shopping; my brother, for the times he made me to laugh; Aunty Cecilia, for her constant care and prayers over the years; and my sister, for making me remember the most important things in life.

I would not have been able to complete this PhD without my supervisors. I am indebted to my primary supervisor Dr Emma Godfrey, for her wholehearted dedication and consistent support throughout my PhD, and for her encouragement through the difficult times. I thank Dr Isaac Sorinola, for his constructive criticisms; and Professor Sheila Kitchen, for encouraging me to the end.

I appreciate some external people that supported my PhD, including Professor Andre Kengne, for his advice while conducting the systematic review, his belief that ‘I could do it’, and for providing invaluable career advice; Bolaji Coker for providing statistical advice throughout my PhD; and Professor Alarcos Cieza for the great experience I got at the WHO.

I thank my mentors Professor Bartho Okolo and Professor Chika Onwasigwe for the pivotal roles they played in my PhD specifically, and my career in general; and my friends, particularly Professor Bond Anyaehie, whose assistance at the University of Nigeria made this PhD easier.
1 Introduction

1.1 Chapter summary

This chapter presents a critical review of the literature relevant to this thesis. It starts by examining various definitions and ways of categorising low back pain (LBP), chronic low back pain (CLBP), and any associated disability (sections 1.2 and 1.3). This is followed by highlighting the limitations of LBP research in Nigeria (section 1.4). The biopsychosocial factors implicated in early onset LBP and subsequent transition to CLBP are then reviewed (section 1.5). The next section highlights the significant burden of nonspecific CLBP in rural Nigeria (section 1.6). This is followed by reviewing the treatment of CLBP and the guidelines recommending self-management (SM) of non-specific CLBP (section 1.7). Different SM models and the theories underpinning them are discussed, and the effectiveness of SM for CLBP is then assessed (section 1.8). Finally, the potential usefulness of SM in rural Nigeria, conclusions of the literature review, and the objectives of the thesis are outlined (sections 1.9, 1.10 and 1.11).

1.2 Definitions and categorisation of sub-types of low back pain

LBP lacks a uniform definition (1, 2). Most definitions lack topography, temporality or both (2). For instance, Louw et al. (3) defined LBP as “pain in the lumbar region of the spine”, and Schmidt et al. (4) described it as pain around the entire back (upper, middle and lower). Both definitions did not specify pain duration. The definition of LBP with regards to duration varied from back pain lasting for a whole day or more in the past three months, any frequent back pain in the past year, and pain in the back for most days for at least two weeks, with no specifications of the body area affected in the individual surveys included in a review (5).
Different definitions of LBP may make it difficult to describe both the burden of LBP and aetiological factors associated with it. The most consistent definition of LBP as pain or functional discomfort between the twelfth rib and gluteal cleft, with or without radiation to the legs (6), lasting longer than twenty four hours (1, 7), is used in this thesis.

There are two major classifications of LBP based on either the duration after onset or underlying pathophysiological factors. Acute, subacute and chronic LBP are the three subtypes based on duration. Acute LBP is pain that has lasted for less than six weeks, whereas subacute LBP means pain lasting for between six and twelve weeks (8). However, back pain researchers and professional organisations often specify different cut-off durations for chronic or persistent pain such as six weeks (9), or three months (8, 10-13). Different definitions of acute, subacute and chronic LBP make it difficult to compare findings across studies, identify the underlying factors at each stage of LBP, and the most effective treatments for targeting the factors. The most consistent definition of CLBP namely as persistent pain lasting for more than twelve weeks, is the definition used in this thesis.

However, the course of LBP is increasingly viewed as relapsing and remitting, replacing previous categorisations of LBP as being either acute, subacute or chronic in nature, because recurrence of an acute episode of LBP is almost certain (2). One, three, six, and twelve months after the onset of acute LBP, 80%, 67%, 57% and 65% of patients respectively, still experience pain (1, 2, 14-16). This contradicts other reports which suggest that only about 10% of patients’ progress to chronicity (17-19). Differences here may be because older reports were based on disability and work loss but not pain persistence. However, pain may exist in the absence of disability (20). This has important implications for studies of LBP in Nigeria which have not differentiated between acute and chronic LBP, clarified the rate of progression to chronicity, or explored the biopsychosocial factors associated with back pain (21-30).

Specific and non-specific LBP are the two categorisation based on pathophysiology. Specific LBP is pain due to a particular pathology such as malignancy, spinal fracture, infection, inflammation or cauda equina syndrome (31-33). Non-specific LBP cannot be ascribed to a specific pathology (34), because a definitive diagnosis cannot be achieved by current radiological methods (35). Most CLBP (up to 90%) is non-specific (35-37). This thesis focuses on non-specific CLBP, meaning pain or functional discomfort between the twelfth rib and the gluteal cleft, with or without radiation to the legs, lasting more than twelve weeks, without a
recognisable, known specific pathology such as infection, tumour, osteoporosis, fracture, structural deformity, inflammatory disorder e.g. ankylosing spondylitis, radicular syndrome, or cauda equina syndrome (6, 12, 13).

1.3 Biopsychosocial model of disability: explanation within the international classification of functioning, disability and health (ICF)

An impairment-based biomedical definition of disability is insufficient for understanding the impact of health conditions (38-41). This is more so for LBP, where patients’ perspectives and contexts are central to clinical management and outcomes (42, 43). The WHO, via the ICF framework, provided the most comprehensive and consistent definition of disability, following substantial collaboration and field testing (39, 44-48). The definition has been endorsed by all World Health Assembly member states, and will therefore be appropriate for this thesis (39, 45, 46).

Disability is an umbrella term for impairments, activity limitations and participation restrictions, which result from the interaction between a health condition, and contextual (environmental and personal) factors (49). Disability is a multidimensional concept (Figure 1.1), and includes three main components: body function (physiological and psychological) and structure (anatomy), activities and participation, and environmental factors.

![Interaction between the components of the ICF (49)](image-url)
Abnormalities or loss of body structure and function conceptualises disability at the level of the body, and is known as impairment (49). Impairment does not automatically imply disability, as people with impairment may not experience disability, or do so at varying levels depending on personal, physical and social barriers/facilitators in different contexts (40, 50).

Activity limitation, conceptualises disability at the level of the individual, and results from difficulties in performing specific actions, tasks or activities such as sitting up, standing and walking. Participation restriction explains disability at the level of an individual within a society, and describes problems individuals may have in real life situations within their socio-cultural contexts such as work, school and community activities (49).

The ICF model has been criticised for grouping activity limitation and participation restriction together without explicit differentiation (51). This limitation may be significant as the definitions of these constructs suggest that contextual factors may have more influence on participation restriction than activity limitation. This has important implications for LBP research since back pain specific measures appear to emphasize impairments and activity limitation more than participation restriction (42, 45). Indeed, no back pain specific measure cover remunerative or non-remunerative work outcomes, which are often regarded as an aspect of participation (42, 48). This implies that factors underlying LBP specific disability may not fully explain work-related disability, community participation, and other domains of participation which are likely to be context-specific. This limitation is not evident in the World Health Organisation Disability Assessment Schedule (WHODAS 2.0) (52, 53). The WHODAS 2.0 is an ICF based generic disability measure, with distinct activity and participation domains, that include work-related disability and community participation. Such outcomes need to be considered in CLBP research when appropriate.

Environmental factors are external influences, such as physical, social and attitudinal factors which influence the experience of disability, facilitating or hindering participation (49). Personal factors are internal attributes such as individual beliefs, which impact on disability or intervention outcomes. Environmental restriction may result in a gap between a person’s capacity and actual performance of a functional activity. This is conceptualised at both the activity and participation domains of disability, as environmental restriction may be at the individual, community, or societal level (49).
1.4 Biopsychosocial factors associated with chronic low back pain disability in rural Nigeria are unknown: limitations of low back pain research in Nigeria

Poor back extensor muscle endurance and low physical activity were independently associated with LBP in a cross-sectional study of 649 Nigerian adolescents (54). In urban Nigeria, job-related factors such as lifting, bending, twisting, prolonged sitting and sustained position for over three hours, were associated with greater reports of LBP in cross-sectional studies involving 2,140 adult workers (29, 55-57). The posture adopted during daily activities was not associated with LBP in a cross-sectional survey of 485 primary care patients in urban Nigeria (26). Among 624 Nigerian nurses, heavy lifting and sustained positions for prolonged periods were associated with LBP in cross-sectional studies (30, 58, 59). LBP was attributed to prolonged sitting in a cross-sectional study of 500 long distance drivers in Nigeria (60). Among rural farmers, the major factor associated with LBP was prolonged bending (61). However, all these studies had severe methodological limitations. LBP outcomes were measured with different non-validated self-report questionnaires based on participants’ own perceptions of present pain, LBP over a 12-month period, severity and perceived causes of LBP, and work absence. Although CLBP was the most prevalent type of back pain (61), none of these studies included psychosocial measures, or distinguished between the factors associated with acute and chronic LBP, specific and non-specific LBP, pain and disability.

Non-specific LBP was associated with spondylosis, disc prolapse, spondylolisthesis, sacroiliac joint strain and back strain in a retrospective study of 291 case folders of patients with LBP in a Nigerian teaching hospital (62). However, spinal degeneration may be a normal sign of ageing unrelated to LBP (63-66). Heavy lifting was reported to be the most common predisposing factor for LBP in the former study (62). However, the lack of control for the effects of psychosocial factors and poor hospital case folder documentation may have influenced outcomes.

Although sickness absence or days off work due to LBP appears very low in urban Nigeria (0.14 – 18%) (30, 55, 56), nearly 60% of rural farmers were unable to carry out their farming activities at some point within the previous year, and over 50% of them found it difficult to perform their daily farming work (61). However, none of these studies controlled for the
effects of psychosocial factors or investigated the factors associated with sickness absence or disability.

A cross-sectional study that attempted to investigate the factors associated with CLBP disability in Nigeria, found that pain intensity was not associated with CLBP disability (67). However, this study was severely limited as it focused only on biomedical outcomes such as pain intensity, repeated sit-to-stand, repeated trunk flexion, loaded reach and spinal mobility; included only pain intensity in a univariate analysis with CLBP disability; and the sample size of 23 patients was underpowered to detect statistical significance.

The reliance on patients’ perceived causes of their LBP by Nigerian authors is a significant limitation. Evidence suggests that people in physically demanding jobs were more likely to perceive their LBP to be caused/aggravated by occupational activities, although these may also be linked to psychosocial factors such as fear avoidance beliefs (68, 69). No study has investigated the psychosocial factors associated with CLBP disability in urban or rural Nigeria. A few studies have considered the prevalence of depression among people with CLBP. One cross-sectional study reported a 40% prevalence rate of depression measured with the hospital anxiety and depression scale among 114 patients living with CLBP in urban Nigeria (70). However, this study did not assess the impact of depression on pain or disability. A large cross-sectional survey (6,752 adults), representing 57% of the general Nigerian population, from five of the six geopolitical zones of Nigeria (including Enugu State), found comorbid conditions which included mood disorders. These conditions resulted in a 37% reduction in functioning measured with the World Health Organisation Disability Schedule, among the 16.4% of the population with chronic spinal pain (71). However, the lack of a valid definition of CLBP in this study, which was based on respondents’ own interpretation of chronicity, impedes establishment of associations.

The conventional LBP treatment in Nigeria is biomedical, and includes bed rest, analgesia, postural education, manipulation and therapeutic exercises (55, 56, 72). For instance, the Nigerian urban back school is biomechanical, and provides patients with information on the anatomy of the spine, good posture and exercises (73). However, pain medication appears to be the most popular treatment among patients (30, 55). Spinal radiographs and laboratory tests are recommended to patients with LBP in Nigerian hospitals regardless of the type of
LBP (62, 72, 74, 75). This conflicts with evidence-based guidelines for the management of LBP (9, 11, 12, 32).

This literature review has therefore shown that the biopsychosocial factors associated with CLBP disability in rural Nigeria are currently unknown, and that furthermore, no treatment has been identified to address them in Nigeria.

1.5 Biopsychosocial factors associated with early onset and chronic low back pain

Causative factors for LBP are complex and multifactorial. Evidence suggests that physical factors may be more important in early onset LBP, whereas psychosocial factors may be the most significant factors in CLBP, and that the latter predict the transition to and maintenance of CLBP (13, 20, 34, 76-82).

1.5.1 Biopsychosocial factors associated with early onset low back pain

1.5.1.1 Physical factors

Systematic reviews have found that increased and prolonged trunk flexion and twisting, and spinal loading were associated with first onset LBP. However, different thresholds were used in quantifying postural exposure and spinal loading, which may explain the conflicting or lack of evidence for dose-response relationships (76, 83-87).

Systematic reviews of field based studies, as well as pain provocation and anatomical studies, suggest that changes in the lumbar intervertebral discs (IVDs), facet joints, sacroiliac joints, vertebral end plates and the trunk muscles, may be associated with early onset LBP (63, 64, 82, 88, 89). However, medical history, physical examination and radiographic examinations have yielded mixed results in the diagnosis of pain in all spinal structures (63, 90-92). Many patients with LBP do not exhibit spinal pathological features, and when present, they are not responsible for pain in all patients (65). Palpation, provocation/palliation manoeuvres and special tests have low sensitivity and specificity in diagnosing pathology in spinal joints (63,
Diagnosing spinal pathology is subjective as it relies on patients’ perceptions, which are often confounded by psychosocial factors (93); and the radiologists’ interpretations because there is lack of definite thresholds for diagnosing spinal tissue degeneration (64). A cross-sectional study of 2,256 women in the UK (371 monozygotic and 698 dizygotic twin pairs, 29 sibling pairs and 60 singletons), found that the most important risk factor for severe and disabling LBP was the degree of lumbar disc degeneration, driven by genetic heritability (94). Summary scores rather than specific thresholds were used for disc degeneration assessment in this study.

Repetitive or sustained spinal tissue loading is suggested to have a U-shaped relationship with spinal structures as very low or very high tissue load is believed to lead to spinal tissue injury, while moderate spinal loading is believed to be protective (76, 95). However, the exact meaning of very low, moderate and very high tissue loading is ill-defined (84, 85, 87), and may vary in different individuals. This makes establishment of causal relationships difficult. Moreover, the “healthy worker” effect, where healthy workers remain and less healthy workers change or leave their jobs, has been shown to obscure the association between biomechanical factors and LBP (96).

Spinal instability has been linked to LBP (88, 97-100). However, it is unclear whether spinal instability is a cause or consequence of LBP, as many studies involved patients that already had LBP (99, 101-105). Moreover, spinal stabilisation was not superior to back-related advice in preventing early onset LBP (106), and may not be useful outside specific subgroups of patients with LBP (107). Defining and diagnosing instability is difficult (97), as it is subjective and challenging in clinical settings (88), with radiological instability believed to be different from functional instability (98). There is also difficulty in measuring spinal motions in vivo in clinical settings, and it is unclear whether instability is related to hypermobility or hypomobility (97, 98). Extension-flexion radiographs do not provide information about the active and neuromuscular components of the stabilisation system, and often have high false-positive results (98).

The other physical factors implicated in early onset LBP in systematic reviews and individual studies include obesity, reduced lumbar mobility and lumbar lordosis, and a long back (94, 108, 109). However, these factors represent an interaction between genetics and the environment (82, 110).
1.5.1.2 Psychosocial factors

The strength of association between psychosocial factors and first onset LBP is reported to be modest and smaller than in the chronic stages of LBP (110, 111). Systematic reviews have found that negative affect, high psychological demands and emotional effort at work, stress, poor social support and work relations, low level of job control, work pace, monotonous tasks, perceived ability to work, high work dissatisfaction, and the belief that work is dangerous were associated with first onset and future episodes of LBP (87, 112, 113). The inclusion of studies that only reported significant associations between psychosocial factors and first onset LBP, limits the establishment of the importance of psychosocial factors in early onset LBP (87). Not accounting for the effects of physical factors does not expose the importance of psychosocial factors relative to physical factors in early onset LBP (113). The use of non-validated psychological measures, and the lack of distinction between pain, sick leave, medical consultation, treatment and disability in individual studies (114-117), limit definite causal inferences in the reviews (112, 113). The inclusion of prospective cohort studies that only compared exposed with non-exposed cases, and the exclusion of studies of low methodological quality in another systematic review showed no evidence that job related psychosocial factors were causes or consequences of LBP (118).

Distress, anxiety, depression, catastrophising, fear avoidance beliefs and passive coping were associated with LBP in a systematic review of prospective studies of general psychosocial risk factors (111). However, diverse study quality and designs, including randomised controlled trials, review articles, comparative studies, follow-up studies, prospective studies, and evaluation studies, plus lack of distinctions between pain and disability, and first onset and repeat episodes of LBP, are potential limitations of this review. Overall, psychological distress appears to be a cause and consequence of LBP. This has been consistently found both in studies that followed individuals from birth before first episode of LBP, and those that involved individuals with previous history of LBP (17, 81, 95, 110, 111, 114, 115, 118-122).
1.5.2 Biopsychosocial factors associated with chronic low back pain and disability

1.5.2.1 Psychosocial factors predicting pain persistence and chronic low back pain disability

**Somatisation and culture**

Somatisation usually implies physical symptoms are employed as an expression of emotional distress. Experiencing and communicating distress and somatic symptoms unaccounted for by pathology, attributing them to physical illness, and seeking medical help for them is a key part of somatisation (123). Severely somatising patients have greater levels of role impairment, rates of sick leave and restricted activity days with more days spent in bed per month, and higher rates of unemployment than patients with several major medical disorders (124-130). The Diagnostic and Statistical Manual of Mental disorders, fourth edition (DSM IV), classifies somatoform disorders at the extreme end of medically unexplained symptoms, characterised by physical symptoms, no organic findings, no clear cut physiological mechanism, not under voluntary control and not due to a psychiatric diagnosis (123).

Culture, meaning collectively shared beliefs, values, language, and rituals that produce culturally consistent behaviour (124), influences the use of somatisation. For instance, using somatic words to express psychological distress attracts more positive reactions and social support whereas using emotional terms is stigmatised in Asian and West African culture (124, 125). In contrast, somatisation does not affect social support in western culture with individuals more likely to express themselves in emotional terms (125). The description of a crawling sensation in the body has been used to communicate anxiety and psychological distress among Nigerians (124).

A study involving 25,916 primary care patients in 14 countries (Turkey, Greece, Germany, India, Nigeria, the Netherlands, United Kingdom, Japan, France, Brazil, Chile, United States, China, and Italy) found that the prevalence of somatisation did not clearly vary according to
geography or level of economic development (126). The ICD-10 (International Classification of Diseases, Tenth Edition), one of the measures used to identify somatisation in that study, may have only identified the most severe forms of somatisation, defined as predominant/exclusive somatic clinical presentation of psychiatric disorder, which is rare in primary health care regardless of the country (126). The prevalence of somatisation, defined using both the ICD-10 and less restrictively defined form of somatisation, measured with the somatic symptom index, showed that South American patients had the greatest prevalence rates (Rio de Janeiro: 8.5% and 32.0%; Santiago, Chile: 17.7 and 36.8% respectively). For somatisation measured with the ICD-10, Japan (Nagasaki: 0.1%), Italy (Verona: 0.1%), Nigeria (Ibadan: 0.4%), and UK (Manchester: 0.4%) had the lowest rates (126). These low prevalence rates could be because the burden of somatisation may be less in primary health care compared with specialist health care.

Somatisation is clearly associated with adverse psychological and health outcomes in all cultures, whereas psychologising or the use of negative emotional words does not have a simple linear relationship with psychological and health outcomes (125). A multisite longitudinal prospective cohort study of 611 individuals in the Netherlands, showed that somatisation increased the risk of developing depression or anxiety in subsequent years over and above baseline levels of depression or anxiety (127). Somatisation in West Africa and East Asia has been associated with increased interoceptive awareness, hypervigilance, and exaggeration of perceived symptoms (124).

Somatisation has also been implicated in the development of impairment and disability. Somatisation with or without depression decreases physical, social, and occupational functioning, and increases health care service use and disability in general primary care patients (126-128). Independent of medical and psychiatric co-morbidities, such as congestive heart failure and peripheral vascular disease, panic, anxiety and depressive disorders; somatisation increases impairment, functional and work-related disability above and beyond these co-morbidities in community and primary care patients (128, 129). In patients with CLBP, somatisation with and without depression is associated with increased pain intensity, persistent pain and/or back-specific disability (79, 131).
Psychological distress

A systematic review of prospective studies by Pincus et al. (79), found that distress, and to a smaller extent somatisation, were implicated in the transition from acute LBP to CLBP. Insufficient evidence was found for fear avoidance beliefs, catastrophising and praying/hoping as predictors of chronicity as only one study (132) assessed these outcomes in the review. Distress represented a composite of psychological distress, depressive symptoms, and depressive mood, as individual studies did not distinguish between these terms in the review (79). The definition of CLBP varied, and included duration of persistent or intermittent back pain, disability levels, symptom description, work status, time to return to work, days off work due to back pain, and/or pain intensity in the individual studies. Additionally, the inclusion of patients with CLBP at baseline in the individual studies limits the establishment of temporality between psychological distress and CLBP (79).

These limitations are also common in more recent primary research studies. For instance, baseline measures were collected from prospective cohorts at 90 days when processes associated with chronicity may have begun (133). There was inclusion of cohorts with significant LBP at baseline (77), or previous episodes of back pain (134, 135). All these limitations make it difficult to establish definite links between psychosocial factors and chronicity, the so-called temporal precedence.

Individual prospective studies defined chronicity with individual or combined measures of chronic back pain and disability (135-137). The concepts of chronicity and disability are different, and may not necessarily be predicted by the same factors, and hence need to be separated in primary studies. For instance, chronicity implies the persistence of pain i.e. duration, whereas disability may relate to limitations in function and work-related activities. Furthermore, pain cannot infer disability as it can exist in the absence of disability (19, 138).

Strong evidence from systematic reviews suggests that anxiety and depression are predictors of pain persistence and CLBP disability (20, 79, 138, 139). However, anxiety and depression failed to predict failure to return to work in two systematic reviews with return to work/sick leave as the primary outcome (140, 141). The inclusion of only those prospective studies with acute LBP patients at baseline establishes temporality between anxiety, depression and
work/sick leave in the latter reviews. This suggests that predictors of functional and occupational related CLBP disability may be different.

Recent evidence from non-western and western settings has further supported the association of anxiety and depression with CLBP and functional disability (142-145). However, the cross-sectional designs of these studies prevents any inference of causality. Anxiety (63%; Tangestani et al. (146)) and depression (51%; Sagheer et al. (145) are highly common among people with CLBP, with women being significantly more likely to report them (145, 146).

**Fear avoidance beliefs and catastrophising**

Robust evidence from a systematic review found that in addition to psychological distress, fear avoidance beliefs and catastrophising were implicated in chronicity and CLBP disability (138). This review was strengthened by only including prospective studies with patients with acute LBP at baseline, which enabled the establishment of causality. Another strength of the review is the separation of pain (duration, intensity), disability, work status (duration of sick leave, compensation status), participation (restriction in leisure, social and family activities), and patient satisfaction (self-perceived recovery, satisfaction with current symptoms) outcomes which clarified associations. For instance, catastrophising and fear avoidance beliefs were found to be more predictive of disability than the chronic evolution of LBP (138).

The fear avoidance model posits that some individuals avoid activities anticipated to cause pain, even when they are neither harmful nor painful, which leads to disuse, deconditioning and poor performance of physical tasks (68, 69, 134, 147-149). Fear avoidance beliefs are consistent predictors of chronicity, CLBP disability and failure to return to work, in systematic reviews (138, 140, 150), and state of the art reviews (68, 69, 111, 147, 148). A recent systematic review with clearly defined work and non-work disability outcomes has also shown that fear avoidance beliefs are mediators and moderators of treatment efficacy (return to work, perceived disability and pain) in patients with back pain (150). Work-related fear avoidance beliefs and catastrophising were associated with LBP disability in 366 South African steel plant workers involved in manual labour (151). Fear avoidance beliefs were almost three times (OR=3.40) more powerful than catastrophising (OR=1.31) in predicting functional disability in South Africa. However, the involvement of mostly males in an urban African
occupational setting limits generalisability to other African populations. In addition, the cross-sectional design of the study and the lack of distinction between acute and chronic LBP limit the ability to make causal inferences.

Catastrophising has been defined within the fear avoidance model as exaggerated negative beliefs in the worst likely outcome, the view of situations as significantly worse than they actually are (152), the tendency to magnify the threat value of pain stimulus, feeling helpless in the context of pain, and being unable to curtail pain-related thoughts in anticipation of, during or following a painful experience (153). Cumulative evidence suggests that catastrophising predicts persistent pain and CLBP disability (20, 152, 154, 155), and is a mediator and moderator of treatment efficacy in patients with CLBP (156). Importantly, disability outcomes were categorised into work-related (sick days, employment) and non-work related (pain, perceived disability) in the systematic reviews (152, 156). In individual studies, catastrophising and fear avoidance beliefs have jointly predicted CLBP disability (157), as they are clearly associated (153). A large proportion of people with CLBP (78%) have catastrophic thoughts (146).

However, the importance of catastrophising in relation to disability, pain and treatment efficacy has been challenged (158). For instance, one RCT (159) that found catastrophising was irrelevant to treatment outcomes, was not included in the systematic review which found fear avoidance beliefs important in CLBP disability (156). Although four RCTs supported the role of catastrophising in CLBP treatment outcomes in this review, two included RCTs did not find catastrophising a predictor of disability (160), and treatment satisfaction (161).

The reason for this could be that the relationship between catastrophising and disability disappears when other psychosocial variables, such as trait anxiety (162), fear avoidance beliefs (163), or pain self-efficacy and illness perceptions (164) are accounted for. There is also evidence that catastrophising increases when treatments fail, and reduces significantly with effective treatments (165). This may explain the significant association between catastrophising and pain related disability in cross-sectional studies of patients who have received multiple treatments for CLBP (166-168). Catastrophising may therefore be more properly understood as a consequence rather than a cause of treatment failure.
**Illness perceptions**

Illness perceptions are the personal ideas people have about an illness (169). Illness perceptions include the following dimensions: perceived illness identity, perceived causes, perceived consequences, perceived timeline and perceived illness controllability (170). Patients’ beliefs such as the meaning of symptoms, ability to control pain, the impact of pain on patients’ lives, and worry about the future are believed to play a crucial role in chronic pain because they influence psychological and physical functioning (19, 80, 171). A comprehensive review (153) found strong evidence to support the role of pain perceptions, in addition to depression, fear avoidance beliefs and catastrophising in the maintenance of CLBP and CLBP disability. However, the overlap between aspects of these four factors has led to difficulties distinguishing which aspects of psychological functioning influenced or predicted CLBP in this review.

A recent systematic review that investigated the influence of illness perceptions in physical health conditions found that illness perceptions explained between 25% and 30% of the variance in emotional health outcomes in cross-sectional studies (172). Perceptions of illness consequences and emotional representations had the strongest relationship with emotional health outcomes (172). However, the inclusion of cross-sectional data in this review prohibits the inference of causality, and rheumatoid arthritis was the only musculoskeletal condition included. Another recent systematic review of general health conditions including musculoskeletal conditions, confirms the predictive power of illness perceptions on depression, anxiety and quality of life (170). No systematic review exists examining the role of illness perceptions on pain persistence and CLBP disability, probably because only a few studies have investigated their role in CLBP.

Two prospective cohort studies have shown that illness perceptions influenced clinical outcomes following CLBP treatment (164, 173). Of twenty psychological factors related to CLBP recovery, illness perceptions and pain self-efficacy were the most predictive of disability, above fear avoidance beliefs, catastrophising and depression (164). However, this large prospective cohort study used mixed LBP and CLBP samples, inhibiting isolation of associations. Reductions in perceived consequences, emotional representations and illness identity (number of symptoms patients feel are related to their back pain), and increases in treatment and personal control were the specific back pain perceptions associated with
reduced CLBP disability in primary care patients in the UK (173). Improvements in illness coherence and timeline (acute or chronic) were found in the CLBP patients that reported improvements in global rating of change. That is, CLBP patients with good clinical outcomes six months after consultation, perceived less serious consequences, reported fewer emotional responses, such as fear or anger, experienced fewer symptoms that they attributed to their back pain and had stronger perceptions about the controllability of their LBP (173). Illness perceptions differ between individuals with and without CLBP, for example, individuals with CLBP often believe that people do not recover from it (174). Illness perceptions, particularly belief in serious consequences, and to a lesser extent low personal control and chronic timeline, predicted pain-related disability in a prospective study of chronic orofacial pain patients (175). Two recent RCTs found that interventions targeting illness perceptions improved functioning and reduced maladaptive illness perceptions such as perceived consequences of CLBP (176, 177). However, one of the RCTs included a mixed sample of acute and chronic LBP (177).

Illness perceptions have been shown to significantly mediate the impact of pain severity on both emotional and physical dysfunction in a cross-sectional study of chronic pain patients (178). In this study, the relationship between pain and emotional dysfunction was mediated by representations of pain as a highly emotive experience (emotional representations), and by catastrophising. In contrast, the relationship between pain and physical dysfunction was mediated by representations of the high consequences of chronic pain (consequences), but not by catastrophising (178). Illness perceptions are posited to influence coping strategies which impact on health outcomes through Leventhal’s self-regulatory model of illness cognitions (179-181).

**Coping strategies**

Coping is an effortful response to manage the external or internal demands that strain a person’s resources (182), and has been found to mediate the influence of pain intensity on functional disability and quality of life (183). A systematic review has implicated passive coping strategies in the evolution of LBP into CLBP disability (138). Passive coping involves withdrawal or relinquishing control to an external agent, such as depending on doctors for
pain medication; whereas active coping is seen as adaptive, requiring an individual to initiate instrumental action to deal with pain, such as exercising (184). Passive coping strategies are hypothesized to be stimulated by maladaptive illness perceptions (172) and fear avoidance beliefs (68, 69, 134, 147-149).

Passive coping strategies include depending on others for daily tasks, perceived inability to control pain, and hoping for better pain medication from doctors. They have been shown to increase the risk of persistent disabling CLBP in a large prospective cohort study (185). Another prospective cohort study identified passive coping strategies like distraction/praying and helplessness/hopelessness as predictive of functional disability and emotional distress respectively, one year after initial episode of LBP (133). Distraction and praying/hoping were more predictive of pain intensity, whereas ignoring pain sensations and coping self-statements were associated more with disability (182). Diverting attention and praying/hoping were associated with greater pain, disability, depression, and pain-related anxiety, less uptime, and worse work status in a cross-sectional study (186). Praying, hoping, and catastrophising have been associated with more anticipatory anxiety, greater anxiety during painful activity, and reduced range of motion from the onset of pain increase to the point of pain tolerance (184). Contradictory findings were found in a study showing increased use of praying and hoping strategies following treatment were significantly related to decreases in reported pain intensity (187). However, the use of a non-validated pain diary of verbally reported pain intensity, and merging praying/hoping with diverting attention may have influenced findings in this rather old study. This is because diverting attention is sometimes useful in CLBP (188). More recent studies have consistently shown that passive coping strategies such as focusing on pain, restricting social activities, and depending on pain medication are associated with poor CLBP outcomes including disability and sick leave (189-192).

A belief in the ability to control pain, avoiding catastrophising and not believing that one is severely disabled appeared to improve functional outcomes, and may mediate the relationship between pain severity and adjustment (184). However, the use of coping scales which confounded the constructs of coping, beliefs and adjustment is a limitation of the individual studies included in this critical review of the literature (184). Catastrophising has been shown to overlap with negative mood such as depression, anxiety and anger (193), and
has been categorised as an appraisal or pain related belief, rather than a coping strategy (182, 184). Other studies have categorised catastrophising as a passive coping strategy (151, 187, 188, 194).

Active coping strategies are believed to be adaptive (195, 196). Active coping strategies including staying busy or active, distracting attention from the pain and taking part in physical activity/physiotherapy were associated with neither an increase nor a decrease in the risk of developing a new episode of LBP in a large prospective study (185). Similarly, another study found that active coping (participation in exercise or physiotherapy) did not predict LBP-related sick leave (189). The use of coping self-statements such as telling yourself that you can cope with the pain regardless of intensity (197), was associated with lower skin conductance during anticipation of pain, and greater range of motion, whereas praying/hoping was associated with greater self-reported pain and fewer activity repetitions, in a cross-sectional study (184). However, coping self-statements, labelled as denial of pain, were not associated with positive outcomes in another study in the USA (187), similar to findings in South Africa (151, 194). Diverting attention was associated with increased pain intensity, while helplessness was related to depression and functional impairment in the USA based study (187). The South African studies involved 475 mainly male urban workers in the steel and manganese industries and are therefore not representative of the general African population (151, 194).

The definitions of active and passive coping strategies may differ in different contexts due to cultural differences in coping with pain (198, 199). Moreover, evidence suggests that after controlling for catastrophic thinking and pain self-efficacy, coping strategies (distraction, praying or hoping) and (ignoring pain sensations, coping self-statements) no longer contributed significantly to pain and CLBP disability respectively (182). Therefore, the relative importance of different coping strategies may well vary in different cultures and according to the outcome measures included.

**Job-related psychosocial factors**

Three systematic reviews suggest that job satisfaction and work organisational factors do not predict return to work/sick leave (138, 140, 141). Social support at work was not found to
predict transition to chronicity (138), but social dysfunction/isolation predicted duration of sick leave (141).

Strong evidence suggests that recovery expectation regarding return to work is predictive of positive work outcomes (140), but stress, anxiety and occupation (blue collar versus white collar) are not associated with work outcomes (140, 141). The number and extent of working hours do not influence duration of sick leave (141).

There is insufficient evidence for posture, vibration, driving, high work speed, job demands, job control, job strain, and work flexibility as prognostic factors for duration of sick leave because only a few studies have studied them (141). There is inconclusive evidence that compensation predicts work outcomes (140). However, another systematic review found that receiving higher compensation was a predictor for longer duration of sick leave (141). The conflicting findings with regards to compensation may be due to different interpretations in the two systematic reviews. In the former review (140), studies from seven countries with different compensation mechanisms were included and were poorly described. This made it impossible for the reviewers to compare compensation strategies across studies, such that inconclusive evidence for the role of compensation was concluded (140). In the latter review (141), all three high quality studies found strong evidence for a negative effect of receipt of high compensation on duration of sick leave. Importantly, the authors’ conclusions were based on study quality, as opposed to compensation mechanisms.

1.5.2.2 Integrated psychosocial and physical factors predicting pain persistence and chronic low back pain disability

Despite the importance of the biopsychosocial model of CLBP disability which acknowledges the interaction of cognitive, emotional, motivational, behavioural and physical components (111), most studies have either focused on the role of psychosocial or biomedical factors on CLBP disability (80). Comparatively fewer studies used a multivariate approach to concurrently investigate psychosocial and physical factors to clarify the relative contribution of each to CLBP disability. The biomedical model assumes that pain and disability are secondary to patho-anatomical disorders, and that addressing these factors should reduce or
cure symptoms (200, 201). However, the biomedical model has been unsuccessful in the treatment of CLBP, hence the paradigm shift towards the biopsychosocial model (43, 201-204).

This may help explain why single dimensional approaches (biomedical or psychosocial) do not produce large effects as shown in systematic reviews (205-207). Recent evidence supports the superiority of integrating psychosocial approaches such as cognitive behavioural therapy (CBT), and active approaches such as exercises (208-210). Therefore, integrated/biopsychosocial models of CLBP are required considering the strong evidence linking non-specific CLBP to a complex combination of psychological, social, physical, behavioural, lifestyle, immune/neuroendocrine, neuro-physiological (peripheral and central nervous system changes) and genetic factors (211, 212).

**Integrated psychosocial and biomechanical/neuromuscular factors**

A systematic review that investigated psychosocial and physical factors associated with CLBP found that doing heavier work predicted longer duration of sick leave (141). The influence of occupational biomechanical factors in CLBP has been suggested in other primary studies that accounted for psychosocial factors. For instance, a prospective study that examined individual, psychosocial, and workplace risk factors associated with the transition from acute to chronic occupational back pain found that severe leg pain, obesity, self-reported disability, psychological distress, the unavailability of light duties on return to work, and a job requirement of lifting for at least three quarters of the day were independent determinants of the transition to chronicity (213). However, chronicity was defined by the duration of earnings-related compensation for back pain, and generalisability of the findings of the latter study may be restricted to workers covered by no-fault, non-adversarial workers’ compensation systems (213).

Another prospective study found that adverse employment outcomes such as leaving jobs and the inability to carry out normal duties depended more on the physical demands of a job such as lifting, bending, twisting, digging or shovelling (65). In contrast, functional disability may be more strongly predicted by poor mental health and the tendency to somatise (65).
another study, participants who changed to less heavy tasks were more likely to have a sustained remission of mild back pain symptoms, suggesting that heavy work may be associated with more LBP symptoms (110). These results were independent of abnormal spinal structural findings, and heavy work was not associated with increased functional disability in this study.

Sustained remission from baseline persistent back pain appeared to be linked to occupational factors including leaving a heavy labour occupation, neurophysiological variables such as chronic non-lumbar pain, and psychosocial factors such as psychological distress and fear avoidance beliefs in another prospective study (214). In a French population predominantly involved in heavy jobs involving heavy lifting and repeated trunk flexion, combined biomechanical and psychosocial occupational exposures during working life appeared to have additive and interactive effects on functional health in retirement (215). Notably, only 38% of the workers had functional limitations suggesting that biomechanical factors were important in only a few of these individuals (215).

A contradictory finding was reported in a prospective cohort study where the physical demands of a job did not predict return to work status after accounting for pain intensity, workers’ compensation, female gender, personality, depression, and severity of injury (18). The different result in this study could be due to the exclusion of people who had left their previous jobs or were seeking new jobs from the analyses (18). People engaged in heavy work, without psychological distress, who had low fear avoidance beliefs were more likely to be resilient to CLBP disability than people with lighter occupations (214). However, people in lighter occupations had significantly greater baseline psychological distress, which may have confounded the results in this study (214). Heavy work did not appear to be related to non-return to work in a review (171). However, work load assessment was imprecise in this review.

Cumulative exposure to occupational biomechanical factors has been suggested to be protective, although this could be due to the “healthy worker effect”, as unhealthy cohorts left their occupation over time (7). This “healthy worker effect” was also apparent in another prospective study that suggested that the longer a person stayed in a physically demanding job, the less likely it was for this person to develop LBP (110). This could be because people who developed LBP may have already left the job (110), which may explain why
biomechanical factors, such as heavy lifting and prolonged kneeling or squatting, were more likely to predict new onset LBP in newly employed workers (95).

Motor control impairments have also been implicated in CLBP. In a study that only assessed sitting posture, motor control impairments in normal sitting were associated with pain persistence in CLBP patients that had flexion or extension control impairments, compared with healthy participants (216). However, no differences were found between healthy participants and those with CLBP when all patients with CLBP were included regardless of the type of motor control impairments (216). It was proposed that the ‘wash-out effect’ may explain the limited evidence for the influence of motor control impairments in the combined group of CLBP patients, as the findings in one subgroup of patients (flexion impairment) could have been ‘washed out’ by opposite findings in patients belonging to another subgroup (extension impairment) (216). However, this study did not assess flexion and extension impairments in the healthy participants, did not control for the effects of psychosocial factors, and had a cross-sectional design. All these limitations prevent the establishment of any definite associations between these impairments and CLBP. In a case study that targeted both motor control deficiencies in CLBP (movement and control impairments), and psychosocial factors (fear of movement), pain and disability were reduced (35). However, it was unclear whether positive outcomes were due to improvements in motor control impairments, fear of movement, or both, as these outcomes were not assessed (35).

Integrated psychosocial and spinal structural factors

Robust evidence from systematic reviews suggests that spinal structural factors do not predict CLBP (66, 90). There was no firm evidence for the presence or absence of a causal link between radiographic findings and non-specific LBP (90). Disc degeneration may be unrelated to LBP as it is highly prevalent in asymptomatic individuals (ranged from 37% of 20-year-old individuals to 96% of 80-year-old individuals) (66).

Pain intensity followed by fear avoidance beliefs were the only factors that predicted CLBP disability in a multiple regression analyses that included demographic variables, pain duration, physical pathology, pain intensity and fear avoidance beliefs (217). It is however difficult to establish directional relationships due to the cross-sectional design of the study.
In a prospective cohort study, adverse employment outcomes such as the inability to carry out manual activities were not clearly associated with spinal abnormalities observed with magnetic resonance imaging (65). In another prospective study, the strongest predictor of CLBP disability and health facility utilisation in a cohort of patients with both structural and psychosocial risk factors followed up for five years was baseline psychological distress (214).

**Integrated psychosocial and biological factors**

A prospective study suggested that widespread pain, radiating leg pain, restriction in two or more spinal movements and female gender were associated with pain persistence (137). Fear avoidance beliefs, age, pain duration, pain radiation, pain intensity, and education contributed significantly to the prediction of perceived disability at follow-up in a prospective cohort of patients with acute LBP followed up for six months (135). Psychological distress, somatisation, radiating leg pain and restriction of spinal movement predicted pain persistence in another prospective study (137). Contradictory findings were found in a cross-sectional study in which pain severity did not predict disability or quality of life. Instead, disability was predicted by pain duration whereas quality of life was predicted by disability (218). Pain intensity may be less important in failure to return to work as evidence suggests that individuals often return to work with significant pain (20).

Clinical tests such as the straight leg raise test, lateral and sagittal mobility, finger-floor distance, Achilles reflexes, and ability to sit up, and medical history such as number, duration, and severity of previous LBP episodes are not clearly associated with disability (171). Although some of these clinical tests may in themselves reflect disability, such as the ability to sit up, they do not indicate wider aspects of disability such as participation.

In conclusion, psychosocial factors are clearly associated with CLBP disability, pain persistence and return to work status. Psychosocial factors increase pain experience via central sensitization in the descending pain pathways through forebrain influences that reduce inhibitory activity of the motor cortex (219-222). This process has been termed cognitive-emotional sensitisation (220). There is no clear evidence that changes in spinal structures are associated with CLBP disability and pain persistence. There is some evidence that occupational biomechanical factors may influence work outcomes but not functional
disability. The limited importance of biomechanical factors in relation to CLBP is commonly reported in western developed countries (68, 223). However, the influence of the “healthy worker effect” and any “wash-out effect” need further clarification. Most back pain related research has been conducted in western developed countries such as the UK, USA and the Netherlands. It is possible that the ergonomically adequate work environments in these countries, in contrast to rural Nigeria and other rural African contexts (224-226), could play a part in these findings. The influence of biomechanical factors relative to psychosocial factors on functional disability has yet to be investigated in rural Nigeria.

1.6 Burden and impact of non-specific chronic low back pain in rural Nigeria

Low back pain (LBP) is the leading cause of years lived with disability in developed and developing countries according to global burden of disease studies (1, 15, 16, 227). LBP affects 80-85% of people over their life time in developed countries (1). The impact of LBP is multifactorial including pain and disability. LBP is one of the most expensive (personal and societal) diseases in developed countries costing $90.7 billion, £11 billion, and $9.17 billion in the USA, UK and Australia respectively, between 1998 and 2001 (1, 16). The impact is likely to be more devastating in developing countries (2). This is especially in rural African and other low-income contexts where culture and common activities such as fetching water, farming, and carrying heavy objects, combined with high levels of poverty and lack of health services may increase the risk and impact of LBP (228, 229). However, it is unclear whether these factors contribute to pain persistence and disability, and there is a paucity of data in rural Africa. In rural Botswana, hard physical labour and socio-economic deprivation were perceived to be associated with chronic musculoskeletal conditions (229, 230). Despite the high methodological quality of this focused ethnography, the reported accounts of LBP may not elucidate true associations, which will need to be investigated through quantitative research. However, global burden of disease studies have focused on impairments and activity limitation but not any wider impacts such as participation restriction, caregiver’s
burden and economic impact (1, 16) and therefore may underestimate the impact of LBP in rural Africa.

CLBP is responsible for most of the cost and disability associated with LBP in developed countries (2). One year after first onset of LBP, 65-71% of patients still have pain (14), making it predominantly regarded as a chronic condition (2). CLBP is likely to increase exponentially in developing countries as people grow older in environments with limited health resources, infrastructure and funding (16, 36). This is reinforced by factors including maladaptive illness beliefs and health practices, as well as adverse living and working conditions (229-235). Furthermore, the majority of people affected by CLBP are in their most productive years of life, which may affect families’ livelihood in developing economies where the ability to be productive in these years is crucial to support younger and older family members (16).

Nigeria may have one of the greatest burdens of LBP in the world, possibly accounted for by people living in rural Nigeria. The one-year prevalence rate of 40-85% in Nigeria is greater than 14-51% reported in other African countries (3, 25, 28). Furthermore, the point prevalence rate of 33-40% in Nigeria is greater than the 10-33% in western developed countries including the UK, Canada and Belgium (1, 17). In Nigeria, the burden of LBP is disproportionately greater in rural Nigeria. The prevalence rate of 72% in rural Nigeria (24), approaching 85% among rural farmers (25, 28, 61), is a much higher prevalence rate than the 39% in urban Nigeria (28).

Most studies in Nigeria did not differentiate between LBP and CLBP (22, 24-27, 236, 237), making it impossible to determine the burden, impact and factors associated with CLBP in rural Nigeria. However, most cases are likely to be CLBP due to the recurrent nature of back pain (2). Moreover, CLBP is predominant in the mostly urban-based physiotherapy clinics in Nigeria (238). Additionally, one study showed that most cases of back pain in rural Nigeria are CLBP (61). This has important implications for rural Nigeria, as CLBP is challenging to manage, and up to 85% of people with CLBP have recurrent symptoms throughout their lives (36).

The rural-urban divide in Nigeria may account for the differences in the burden of LBP. Fifty two percent of Nigerians are rural dwellers and 90% of these people rely on peasant farming for their livelihood (239). The predominant self-employment, engagement in physically demanding jobs (24, 26, 27, 30, 237), plus poverty may contribute to the significant burden
of LBP in rural Nigeria. Most rural Nigerians earn less than US$ 1.25 a day, which compares unfavourably with urban dwellers who earn several times more (240, 241), because of higher literacy rates and more paid employment (242, 243).

This socio-economic inequality is associated with differential access to infrastructure and amenities (239), increasing disability and poverty, and further reinforcing inequality as part of a vicious cycle of deprivation (244). Furthermore, medical education and health service management in Nigeria, appears to support the location of tertiary and secondary health facilities in urban areas, which might be a contributory factor in widening inequality (245). Additionally, the rural patients’ maladaptive illness beliefs and health behaviours, and reliance on alternative practitioners, plus health professionals’ unwillingness to travel to rural areas to treat patients may compound these problems (231-235). A rural-urban divide exists in other African countries. It has resulted in outmigration of younger people and changes in family structures which have compounded the existing high musculoskeletal disease burden in rural Botswana (229, 230).

1.7 Treatment of non-specific chronic low back pain

There is little consensus in the literature about the best management strategy for non-specific CLBP. Clinical trials have tested different management strategies, and there is no clear advantage for any treatment (246). Some authors suggested that psychosocial factors, and factors affecting pain tolerance which influence illness behaviour in patients with non-specific CLBP, should be the focus of treatment directed at restoring function and supporting more adaptive coping (247). Other authors have called for a more biopsychosocial approach, with an integrated model incorporating mechanical and physiological processes, as well as psychological and socio-cultural factors that may cause and perpetuate chronic pain (80).

The National Institute for Health and Clinical Excellence (NICE) guidelines for the management of CLBP (9) recommend providing patients with advice and education to promote self-management, in addition to either exercises, manual therapy or acupuncture. In addition, a combined physical and psychosocial management programme which includes cognitive behavioural therapy (CBT) and exercise, for people who have already received less intensive
treatments, and have high disability with or without psychological distress is recommended. Such exercise programmes should be supervised and include aerobic activity, movement instruction, muscle strengthening, postural control and stretching (9, 12). Some of these recommendations were based on the results from high quality trials in developed countries.

Clear evidence from four systematic reviews concluded that CBT had statistically superior though small effects on pain and disability, compared with usual care or waiting list controls (205-207, 248). Self-regulatory approaches were efficacious for pain intensity, pain interference, depression and health-related quality of life. Self-regulation may be regarded as the ability to control one’s emotions and behaviour in order to achieve important long term personal goals (249). Although CBT had small to moderate effects on mood and catastrophising (207), self-regulatory techniques such as biofeedback and relaxation training were better at relieving depressive symptom severity (206). There were no differences in the effects of different psychological treatments (e.g.s operant, cognitive or combined behavioural therapy) on pain intensity in the short and long term (205, 250). Overall, psychological treatments were not superior to active controls including physiotherapy, for pain intensity and disability at follow-up (205-207).

A recent systematic review found that biopsychosocial interventions incorporating physiotherapy and psychological and/or social interventions were superior in improving pain, disability and return to work outcomes beyond one year than physiotherapy alone (210). This suggests that multimodal interventions may be superior to unimodal interventions in managing CLBP. This may explain why the change in pain related disability at one year was not clinically important in a UK-based high quality pragmatic RCT that tested the efficacy of a unimodal CBT intervention for CLBP (251). Despite the cost effectiveness of the intervention, the limited effect on disability could be due to lack of integration of psychological and active components, and insufficient training of the non-psychologists that delivered the intervention (251). CBT requires considerable training and when this is not provided, it has been shown to be much less effective (252). This suggests that physiotherapists may require significant training in the use of the biopsychosocial model in assessing and treating the multitude of interacting factors in CLBP. This is especially important considering the limited physiotherapy undergraduate psychosocial training and time constraints within physiotherapy clinical settings in many countries.
Another promising psychologically based intervention for CLBP is a form of third-wave CBT known as Acceptance and Commitment Therapy (ACT), also called contextual CBT (253-256). ACT is a treatment approach aimed at increasing psychological flexibility by promoting acceptance and values-based action (253, 254). Contrary to traditional CBT principles, ACT posits that one may not need to challenge maladaptive thoughts or beliefs in order to change one’s behaviour, and that trying to adopt positive thinking patterns may not be necessary for successful treatment, and may even have associated risks (254). A meta-analysis suggests that ACT may be as effective as traditional CBT (256).

Supervised exercise, education and manipulation are other interventions with possible benefits (257-261). However, a systematic review found inconclusive evidence of the clinical effects of electrotherapy such as laser therapy and TENS, patient education, massage, traction and superficial heat/cold (262). Two systematic reviews found that exercise therapy improved pain, disability and long term function compared to usual care or non-active control groups such as electrotherapy (262, 263). There was no clear evidence for the superiority of any type of exercise (262, 263), possibly due to the potential contribution of exercise co-interventions (263).

Exercise of any type is thought to decrease fear-avoidance behaviour and facilitate functional improvements, despite ongoing pain (263). Another reason for the non specific effects of exercise could be due to central nervous system effects, as exercise increases pain thresholds due to the release of endogenous opioids, growth factors, and other strong inhibitory mechanisms via descending inhibition driven by the central nervous system (219, 220). This is important as endogenous inhibition of pain during exercise is normal in people with CLBP (219). Although graded exercise has been suggested for chronic pain patients with high fear avoidance beliefs (147), there is insufficient evidence that graded activity improves outcomes in patients with CLBP (264). Graded exercises may be more useful in persistent pain conditions which are characterised by malfunctioning of anti-nociceptive mechanisms to exercise (220).

Strengthening activities incorporating motor control and flexibility exercises were common in effective exercise interventions (263). Supervision improved exercise adherence, and was a common feature of the trials that maintained positive results at short and long-term follow-up (263). Exercise improves back flexibility, strength and performance of endurance activities, and reduces pain intensity and disability through desensitisation of fears, and alteration of
pain beliefs and attitudes (265). However, unimodal exercise therapy is less effective than biopsychosocial multidisciplinary treatment incorporating exercise (210, 262), especially in relation to long-term work outcomes (210).

Evidence suggests that incorporating education, exercises and postural training may be relevant in work-related LBP associated with physically demanding occupations (266, 267). This may be relevant in rural Nigeria, where the majority of workers are manual labourers. Back schools are educational programmes about back care, posture, body mechanics and back exercises, and have been used in CLBP management. A systematic review found conflicting evidence that precluded drawing definite conclusions about the clinical effects of back schools on disability (262). The reasons for the conflicting results could be due to wide variations in the content of the back schools included in the review. A back school which improved pain and overall quality of life, was a comprehensive multidisciplinary programme that increased knowledge about correct posture and body mechanics, emphasized self-awareness and goal oriented coping skills (268). A second back school which reported no improvements in pain and disability, but improvement in quality of life and reduced pain medication use, was a unidisciplinary programme that emphasized posture and exercises (269). Another comprehensive multidisciplinary back school which reported improvements in pain intensity and pain-related functional limitations, incorporated education about pain physiology, posture, back structures, psychosocial and environmental factors with practising relaxation and strengthening exercises (270). Therefore, comprehensive back schools that acknowledge physical, psychological and social factors may be superior to less comprehensive ones.

Evidence suggests that several types of physiotherapy such as individual physiotherapy incorporating advice, general exercises and joint manipulations; spinal stabilisation training involving very specific exercises of deeper trunk muscles that are dysfunctional in CLBP; and physiotherapist-led pain management programmes incorporating education, general exercise, and a paced return to usual activities to improve coping and self-management, may be equally effective in reducing pain and disability (246, 256, 271-280).

Determining which patients may respond better to specific treatments may improve outcomes for patients with CLBP (9, 12), meaning more targeted treatment (160, 281). Some RCTs have sub grouped patients for this purpose. The STarT Back tool is a brief questionnaire
used to subgroup patients into low risk, medium risk and high risk of chronicity using psychosocial and physical constructs (160, 282, 283). One RCT based on this subgrouping method demonstrated the cost-effectiveness of subgrouping via preventing overtreatment of low risk groups (283). However, the difference in effect between high risk groups in the intervention and current best practice groups was no longer statistically significant at 12 months (283). This suggests that there may be further subgroups within the high risk group (153, 202, 284), or that subgrouping achieved in this simple manner does not work in CLBP populations. Another trial of subgrouping based on movement and control impairments (the classification-based cognitive functional therapy), showed superior outcomes over traditional exercise and manual therapy (285). However, the mechanism through which outcomes were produced was unclear as impairments were not objectively measured (285).

Barlow et al. (286) defined self-management as “an individual’s ability to manage symptoms, treatment, physical and psychosocial consequences, and lifestyle changes inherent in living with a chronic condition”. Self-management programmes may be chosen for managing CLBP on the basis of superior cost-effectiveness to the health care system via group programmes (246) and the individual via reduced health care need and utilisation (287); clinical effectiveness of multimodal programmes integrating psychosocial treatment with physiotherapy (210, 262); and accessibility via community-based programmes (287-289). Self-management programmes are particularly useful for chronic conditions where behaviour change is the focus, and individuals are responsible for the daily management of their conditions that may last a life time (290, 291).

The urban-based physiotherapy predominant in Nigeria is underpinned by the biomedical health care model which requires repeated visits (238). This may not be feasible for rural dwellers with chronic conditions who need to travel long distances over prolonged periods of time (234, 292). This has necessitated calls for a paradigm shift in the physiotherapy management of chronic conditions (293, 294). The significant burden of LBP, and lack of access to health care in rural Nigeria, highlights the need to explore alternative approaches to delivering interventions. One solution to some of these challenges might be self-management (SM) which can be an effective, inexpensive, safe and community-based way to manage chronic musculoskeletal pain conditions (295, 296). However, SM is a western concept and most studies examining the efficacy and acceptability of self-management
programmes (SMPs) have been conducted in developed countries such as the UK (295). This has implications for designing SMPs in developing countries where biopsychosocial factors may be different (297). No study to date has explored these biopsychosocial factors in relation to CLBP, or developed an SMP to manage CLBP in rural Nigeria. These challenges will be addressed in this PhD.

1.8 Self-management programmes for non-specific chronic low back pain

1.8.1 Theoretical underpinning of self-management programmes

Theories are important for behaviour change interventions such as self-management programmes, to improve effectiveness and clarify mechanisms through which behaviour change occurs. NICE guidance on behaviour change recommends taking account of the social, environmental and economic context of behaviours (298). As evidence has not supported the superiority of any particular model of behaviour change, the range of behaviour change methods and approaches utilised should be based on the best available evidence (298). There are several theories that can underpin self-management programmes.

The Stages of Change theory (Trans Theoretical Model – TTM) explains that behaviour change occurs through five stages: pre-contemplation, contemplation, preparation, action and maintenance (299). TTM has been criticised for arbitrary boundaries between the stages, instability in the stages as behaviour change may not occur in a chronological order, lack of coherence between the stages, and neglecting the role of reward and punishment in establishing behaviour (300). Moreover, TTM has been much less effective for exercise/physical activity that involve multiple behaviours than for individual behaviours such as smoking (301, 302). Additionally, TTM does not recognise the influence of socio-cultural or environmental factors.

Social Cognitive Theory (SCT) explains that behaviour is influenced by outcome expectations, incentives and social cognitions (303, 304). SCT acknowledges both the individual and society in the development of cognitions and as agents for behaviour change (305, 306). Theory of
planned behaviour (TPB) posits that behavioural intentions are determined by a combination of several beliefs including attitudes towards a behaviour, subjective norms and perceived behavioural control. Both SCT and TPB posit that self-efficacy (the way people perceive their ability to cope with a situation and to control its outcome) influences how they behave in that situation and is needed to form behavioural intentions (307).

SCT has been criticised for being too broad, therefore authors mostly use only parts of it (308). Another limitation is its lack of a unifying structure with limited attention to the influence of emotions (309). The relationship between SCT constructs: outcome expectations, enjoyment, self-regulation, and social support; and physical activity was unclear in one study that may have been underpowered to detect significant associations (310). In a much larger sample of 2,311 individuals with diabetes mellitus, SCT constructs: behavioural goal/intention, self-efficacy, positive outcome expectation, impediments, and social support, significantly predicted 14% of physical activity behaviour at 6 months (311). Self-efficacy was the strongest predictor of physical activity and influenced the other SCT constructs (311). Strong evidence from a meta-analysis of theory informed RCTs suggests that no theory was superior in influencing physical activity, although interventions based on the SCT produced the greatest effect sizes: SCT= 0.42 versus TPB= 0.26 and TTM= 0.31 (312).

TPB has been criticised for assuming that behavioural intention is in fact a proxy for actual behaviour (313). TPB has been able to explain 27% and 39% of the variance in behaviour and intention respectively (314). Intention-behaviour gap (313, 315) may explain why behavioural intentions are always greater than actual behaviour. One study found that 42% of people who intended to engage in physical activity successfully did so (313).

The intention-behaviour gap occurs when individuals develop the intention to change their health behaviour, and yet do not take action (315, 316). Self-regulation constructs have been proposed as one of the ways to bridge the intention-behaviour gap (313). Self-regulation is “a goal-guidance process aimed at the attainment and maintenance of personal goals” (317). Although several factors guide and motivate people, they are unlikely to produce long term behaviour changes unless people develop ways to exercise control over their motivation and actual behaviour (318). Similar to the SCT (318), Leventhal’s Self-Regulatory Model (SRM) of illness cognitions is also based on self-regulation (179, 181). However, unlike the SCT, the SRM is strengthened by its acknowledgement of emotional influences on behaviour (179, 181).
The SRM proposes that symptoms generate both cognitive and emotional representations of a potential illness through three stages: interpretation, coping and appraisal. These representations then influence which behaviours are adopted for coping, while the efficacy of these behaviours is appraised in the final stage to determine whether or not to continue with the coping strategies (181, 319). Although the SRM predicts health behaviour, it has been criticised for providing little guidance on the design of interventions, and no meta-analysis to date has provided evidence of its effectiveness (308). The theory focuses more on individuals, and assumes that individuals are motivated to avoid and manage illness threats, and that people are active self-regulating problem solvers (308). As all stages of the model are interconnected, it may be difficult to measure them separately and establish temporality.

There is a dearth of theoretically underpinned health research in Nigeria. However, the SRM of illness beliefs may be particularly relevant in rural Nigeria where illness beliefs are deeply held and linked to spiritual, religious and cultural beliefs, and influence health behaviours and outcomes (233, 320-322).

1.8.2 Self-regulatory model of illness cognitions

According to the SRM, an individual confronts a potential illness via symptom perception and social messages (Figure 1.2). The individual then assigns a meaning to the problem, expressed as particular beliefs or illness cognitions, which are presented in five domains. “Identity” is the individual’s understanding and label of the illness and the associated symptoms. “Cause” is personal beliefs about the cause of the illness. “Timeline” illustrates how long the individual believes the illness will last. “Control/cure” is the extent to which the individual believes s/he can control or recover from the illness. “Consequences” are the individual’s beliefs about the outcomes and effects of the condition on his/her life (181). Illness cognitions are also known as illness beliefs, illness perceptions or illness representations.

Further research has resulted in the addition of “illness coherence” (how well a patient feels they understand the illness), “treatment control” (how much treatment is believed to help/control the illness), “personal control” and “emotional representation” (how much patients are emotionally affected by the illness) (319). Emotional representations are
expressed concurrently with cognitions, in response to symptom perception and social messages. Emotional representations affect illness cognitions and both influence symptom interpretation in a bidirectional relationship (Figure 1.2).

![Diagram showing the stages of Leventhal's self-regulatory model of illness cognitions and behaviour]

Figure 1.2: Leventhal’s self-regulatory model of illness cognitions and behaviour

Due to the motivation to return to a problem-free state, the individual’s illness cognitions influence any health-related behaviours and coping strategies adopted. Adopted coping strategies then impact on disease outcomes. Finally, during appraisal, the individual evaluates the coping strategies used as either effective or ineffective. The coping strategy will be
continued if appraised as effective and discontinued if seen as ineffective. In the latter, the individual will be motivated to search for alternative strategies. Importantly, emotional representations also affect coping strategies and appraisal of coping strategies (181, 319). The model is known as self-regulatory because the three steps are inter-related and ongoing in a dynamic process (323).

Illness perceptions have been reported to predict health behaviour and activity limitations in various health conditions (172, 324, 325). RCTs that targeted illness perceptions using the SRM were effective for chronic conditions such as myocardial infarction (319, 326), diabetes (327, 328) and obesity (329). The SRM of illness perceptions may also be relevant to non-specific CLBP, as illness perceptions are one of two strongest psychological factors explaining CLBP disability and predicted poor long term clinical outcomes (164, 173).

Only one pilot RCT has specifically challenged illness cognitions in people with CLBP (this included 104 in the intervention group and 52 in the waiting list control group) in the Netherlands (176). There were clinically important improvements in the primary outcome: Patient-Specific Complaints, which was each patient’s most prioritised daily activity. There were also statistically significant changes in illness perceptions, which predicted 14.4% of the variance in patients’ most prioritised daily activity. The intervention had no effect on CLBP specific disability, possibly because patient specific complaints but not CLBP specific disability were targeted, and exercise was not part of the intervention. Evidence suggests that combining psychological and active physical treatments is superior to unimodal approaches in improving CLBP disability (207, 210, 262). Another RCT of an educational programme that targeted illness cognitions in a mixed sample of acute and chronic LBP patients found improvements in illness perceptions, but not in catastrophising, disability and quality of life (177, 330). However, the poor outcomes in this trial could be due to several factors. There was no active treatment component, such as exercise, in the intervention, maladaptive illness perceptions about LBP were not directly challenged, and there was inadequate training of the physiotherapists and GPs delivering the intervention.
1.8.3 Self-management support approaches

Self-management programmes (SMPs) may be based on various models which should reflect patients’ needs, preferences and social context (331). Self-management (SM) models include the Stanford (332), Flinders (care planning) (333), 5As (brief primary care approach) (334), motivational interviewing (335) and health coaching (336) approaches. No approach is superior to others, and approaches often complement each other (331). The choice of approach should therefore depend on patients’ specific contexts and contact with services, their needs and preferences, and organisational factors and service structures (331).

The Stanford model focuses on problem solving, goal setting, empowerment via peer sharing and working in groups of between ten and fifteen participants each, which enhance self-efficacy (331). Stanford-based SMPs typically last for six weeks and can be peer-led, and have been rigorously validated in both high and low income countries (331). This makes it potentially useful for rural Nigeria with a shortage of health professionals (234).

The Flinders model involves individualised and patient-centred interaction based on patients’ identified problems and goals. The model promotes organisational change to enhance chronic disease self-management. As the model involves teams of health professionals and may be time consuming (331), it may not be feasible as a SM model for rural Nigeria.

The 5As model asks about behaviour, advises on behaviour change, agrees to set goals following readiness to change, assists in the acquisition of knowledge and skills, and arranges referrals and follow-up visits. However, this model is not suitable for comprehensive SMPs (331), and hence may not be applicable in rural Nigeria.

Motivational interviewing (MI) involves counselling to assist patients in taking responsibility for their choices, and helping them adopt and maintain healthy lifestyles. MI principles such as expressing empathy, developing discrepancy, avoiding arguments, rolling with resistance, and supporting self-efficacy are utilised. MI requires specially trained health professionals and provides little formal structure (331), which may make it difficult to implement in rural Nigeria. However, some parts of it may be possible to incorporate into other SM models (331).

Health coaching utilises motivational interviewing and other cognitive behavioural approaches to encourage patients to be active participants in the self-management of their
chronic conditions (331). However, due to its flexible approach, implementation difficulty for non-counselling health professionals, and limited evidence of effectiveness in low resource settings (331), health coaching may not be appropriate in rural Nigeria.

SMPs can be delivered using different formats such as face-to-face, telephone, internet, group/individual, written, television, multimedia and social marketing (337). SM models often overlap with educational, psychological or rehabilitation models. However, SM models have unique characteristics emphasizing core skills of self-efficacy building, self-tailoring, self-monitoring, goal-setting and action planning, decision-making, problem solving, and the patient-provider partnership (286). Besides the latter, these skills are central to self-regulation (317, 318), which underpins SM theories such as the SRM and SCT.

The content of most SMPs indicate whether they are generic, disease-specific or a mixture of both. Specific SMPs include specific symptom management and medication, while generic SMPs involve the management of psychological consequences like depression; and life style changes like exercise, social support and communication (286).

1.8.4 Effectiveness of self-management for chronic low back pain

A systematic review with meta-analysis of SMPs for chronic conditions, suggested SMPs had efficacious effects on pain, disability, self-reported aerobic exercise, cognitive symptom management, self-rated general health, self-efficacy, fatigue and depression; small but statistically insignificant improvement in psychological wellbeing; and minimal effects on health related quality of life and health care use (338). This review was not condition-specific and included heterogeneous chronic conditions such as CLBP, chronic fatigue, osteoarthritis, neurological conditions including stroke, mental health, diabetes, HIV infection, heart disease, chronic lung disease and chronic pain. Hence, outcomes may not reflect the true effects of SMPs in CLBP. A more recent systematic review of SMPs for LBP with meta-analysis found moderate quality evidence that self-management has small effects on pain and disability when compared with minimal intervention in LBP (296).

Notably, the latter meta-analysis only assessed pain and disability, and downgraded all included RCTs due to inability to optimally test publication bias. The downgrading of high
quality studies to moderate quality, and moderate quality studies to poor quality, could explain some of the reported low effectiveness of SMPs for LBP in this review (296). The review included RCTs of SMPs for both acute and chronic LBP, in line with evidence suggesting that the clinical stage of LBP may not be an important determinant of the efficacy of SMPs. Similar effectiveness was reported for both the chronic (251, 339-343) and acute stages of LBP (344-350) on selected outcomes such as pain, functional status, reported days with disability, mental and emotional wellbeing, fatigue, depression, anxiety, stress, self-efficacy, fear-avoidance, coping, perceived knowledge, social support, satisfaction with care and health care use. However, many acute LBP episodes resolve spontaneously (11, 12, 34), implying that the effects of SMPs in the acute and chronic stages of LBP are not comparable.

Rather than focusing on the duration of back pain, the content of a SMP may be the important determinant of its effectiveness for CLBP. Comprehensive interventions incorporating psychologically informed treatments with physical treatment may provide longer term benefits when included as part of a SMP for CLBP (251, 259-261, 264, 267, 350-355). However, it remains difficult to pinpoint the most active and effective components within SMPs due to the lack of any detailed description of the content of SMPs in studies. Fortunately, the hierarchically structured taxonomy of behaviour change techniques (BCTs) can allow researchers to clearly describe the content and theoretical underpinning of their interventions (356). BCTs are the active ingredients of behaviour change interventions which alter or redirect causal processes that regulate behaviour (357).

Another important consideration in terms of the content of a SMP for CLBP is sensitivity to the core characteristics of self-management (290). A lack of appreciation of important factors such as self-efficacy building, self-monitoring, goal setting and action planning, decision-making, problem-solving, self-tailoring, partnership between patients and health professionals, and mode of delivery may be linked to poor outcomes (295, 354, 358). For instance, the suitability of the mode of delivery of a SMP in particular contexts may affect accessibility, attendance rates and adherence, which in turn may influence effectiveness (251, 340, 342, 359).

High adherence rates were recorded for an online SMP for CLBP, Pain ACTION-back pain, administered to an educated, predominantly white population in the USA, which produced positive outcomes by improving stress, coping, and social support, and produced clinically
significant differences in pain, depression and anxiety (340). This SMP addressed the core characteristics of self-management. In contrast, low attendance rates were reported among a similar population that utilised a generic, face to face, health facility or community-based SMP (339). Conversely, high attendance rates were seen among another predominantly educated white population with CLBP, using a SMP that was administered face to face within the community (342). Notably, videos were included in the latter study, which might have simulated face to face class interaction. Programme attendance may improve outcomes via facilitating group cohesion, social support and social modeling which may all promote behaviour change (360).

Another factor to be considered is who is going to deliver the SMP (361). SMPs delivered by appropriately trained health professionals have been linked to superior outcomes (251, 252, 362). Consideration also needs to be given to the duration and frequency of administration of a SMP. Most SMPs for CLBP have been delivered weekly for between 4 – 7 weeks for 1.5 to 3 hours’ duration, after which interventions are withdrawn and patients are then followed up (296, 338). Evidence suggests that the effects of SMPs for CLBP peak between 6 months to 2 years, and may be less evident before 6 months and beyond 1 to 2 years (251, 339-348, 350, 355). Therefore, it may be worth delivering booster doses of a SMP at established intervals, as they may help to maintain, even if not improve, clinical outcomes (363, 364).

Demographic characteristics of study participants may be important factors that influence the efficacy of SMPs for CLBP. For instance, elderly participants with CLBP have shown less favourable outcomes after a SMP (339) than a younger population (251, 340, 343, 350). The reason could be because the energy to care for oneself is dependent on other health problems and social issues which may be less favourable in an older age group. This implies that elderly participants in a SMP group may require special assistance to overcome barriers, in order to facilitate behaviour change. Additionally, fairly moderate baseline measures may reduce the efficacy of SMPs in CLBP (339, 347, 348). In contrast, SMPs have been associated with better outcomes in groups with worse baseline measures (251, 340, 343, 355).

Tailoring a SMP for CLBP in different socio-cultural contexts may be linked to superior outcomes (340). Tailoring based on the perceived needs of a specific population to ensure social and cultural sensitivity may lead to better attendance rates and treatment outcomes (365-367). An example of this may involve incorporating specific information relevant to a
particular context, possibly informed by qualitative research (367). For instance, a pilot study of a SMP developed in a western context but delivered in a Chinese population, found that Chinese patients wished to emphasize learning exercise routines rather than learning coping strategies, in contrast to western patients (367). This finding informed the ensuing RCT and improved clinical outcomes (367).

Generic SMPs (339) may compare less favourably with disease-specific SMPs (344, 368), and may explain the poorer effects of generic SMPs for CLBP on pain and functional disability.

The thirty RCTs included in both meta-analyses discussed above (296, 338) were conducted in developed countries among predominantly Caucasian populations, except for one study conducted in China (369). Therefore, the generalisability of these conclusions to a rural African population remains uncertain. Furthermore, no SMP has been developed for people with CLBP in any rural African context to date. However, the potential cost-effectiveness of SMPs for CLBP (246, 251), makes research in this area especially relevant to rural African contexts.

In conclusion, although no studies to date have assessed the efficacy of SMPs for CLBP in rural African contexts, potentially effective SMPs for CLBP in rural Nigerian contexts should reflect important characteristics found in previous research. For instance, cultural sensitivity and understanding of participants’ beliefs, work environment, lifestyle and social circumstances are prerequisites for understanding the underlying mechanisms driving the chronic pain disorder. This understanding can then enable the development of effective biopsychosocial intervention for CLBP in rural Nigeria. Consideration should also be given to other important factors that may affect the acceptability and effectiveness of a SMP. These include careful thought about the core components of self-management, the timing and mode of delivery of the SMP, who delivers the intervention and the length of follow-up.
1.9 Self-management, a potential tool in primary and community health care in rural Nigeria

No research exists in this area, and there is currently no SMP for any chronic condition in Nigeria. There is an absence of rehabilitation services and relevant health professionals in rural communities in Nigeria (231, 244). Community based rehabilitation (CBR) was initially established by the WHO as a strategy to improve access to rehabilitation services for people with disabilities in developing countries, although its scope has considerably expanded in recent years (370, 371). CBR is now regarded as an important strategy within general community development for rehabilitation, equalisation of opportunities, poverty reduction and the social inclusion of people with disabilities. CBR is designed to be decentralised to the community level with most activities carried out from CBR designated centres, which work in close collaboration with primary health care facilities. Some of the many roles of CBR programmes include referring people with disabilities to specialist services such as physiotherapy, and influencing communities’ views and support for people with disabilities (370, 371).

Self-management programmes can help individuals take control over their own treatment. Moreover, these programmes can potentially be administered by lay people (289), hence possibly by community and primary health workers in rural Nigeria. Incorporating self-management into primary health care, and linking it with community based programmes may be a viable option for chronic disease management in rural Nigeria. This will ensure programme linkage to the community and primary health care, and continuity and establishment of patient-health professional partnerships. Community-based SMPs have been successfully implemented in developed countries such as Canada and the United States, particularly among African Americans (372-374). Community health workers, regarded as key to achieving health for all (375), may therefore be relevant in delivering future community-based SMPs in rural Nigeria.
1.10 Conclusions of literature review

Psychosocial factors particularly psychological distress, catastrophising, fear avoidance beliefs, illness perceptions and coping strategies appear to be the most important predictors of pain and disability in CLBP. Occupational biomechanical factors particularly heavy lifting seems to be less influential in functional disability, but may influence work-related disability. The SRM may be a relevant theory for understanding health behaviour in rural Nigeria. Treatments combining psychological (e.g. CBT) and physical (e.g. exercise) approaches appear to be most effective in CLBP. SMPs targeting relevant biopsychosocial factors in CLBP improve clinical outcomes, are cost effective and increase accessibility, and therefore may be relevant in rural Nigeria.

1.11 Objectives of the thesis

Study 1: Explore the experiences of people living with CLBP in rural Nigeria.

Study 2: Explore the management of CLBP in rural Nigeria.

Study 3: Cross-culturally adapt and psychometrically test the measures for assessing the biopsychosocial factors implicated in the experience of CLBP in rural Nigeria.

Study 4: Investigate the biopsychosocial factors associated with CLBP disability in rural Nigeria.

Study 5: Systematically review the available literature and assess the intervention components most likely to improve the acceptability of exercises, and physical activity behaviour in people with chronic non-communicable diseases in Africa.

Study 6: Develop an exercise-based SMP to target the biopsychosocial factors associated with CLBP disability in rural Nigeria and promote exercise-related behaviour change; then assess the programme’s feasibility in rural Nigeria; and produce a refined SMP for use in rural Nigeria.
2 ‘A life of living death’: the experiences of people living with chronic low back pain in rural Nigeria

2.1 Chapter summary

This chapter expands on a published study (376) that explored the experiences of people living with non-specific CLBP in a rural Nigerian community. The chapter begins with a literature review that provides the background to the qualitative study (section 2.2). Methodological considerations, the methods used in the qualitative interviewing of participants and the qualitative analysis of data are described next (sections 2.3 and 2.4). The results of the study are then presented (section 2.5), and the implications of these are explored in the discussion (section 2.6).

This chapter describes the biopsychosocial factors that may be associated with CLBP in rural Nigeria.

2.2 Introduction

2.2.1 Background

The review of literature in Chapter one showed that there is no available research describing the biopsychosocial factors associated with CLBP or its impact in rural Nigeria. Research in other contexts has revealed several factors that may be associated with CLBP, however their impact is likely to be context-specific. MRC guidelines (377) recommend that exploratory qualitative studies are the best place to start when little is known about a population or condition. Therefore, this was the approach chosen for this study.
Evidence based guidelines for the management of CLBP advocate a client-centred approach adopting the biopsychosocial model (9, 11, 12, 32). Patients’ views are central to this model (378) which acknowledges biomedical, psychological and social factors in supporting active self-management of CLBP (379-384). For instance, negative beliefs about CLBP has been linked to CLBP disability (385). The wide variations in pain responses, and the associations between pain, distress and disability imply that relationships may not be linear or causal but multidimensional and variable (386-388).

Pain experience and expression are influenced by cultural factors, and the way pain is perceived and understood may vary in different cultures due to divergent health beliefs (233, 389-395). For example, people of African ancestry are said to report higher levels of pain unpleasantness, emotional response to pain and pain behavior, in response to similar levels of pain intensity than other ethnic groups (396-398). However, other studies have reported little influence of ethnicity on pain experience, after controlling for pain duration, economic, educational and social factors (399, 400). The Africans in these studies were African-Americans and so may not represent African patients in Africa. The possible influence of acculturation and adjustment, with possible differential adverse influence on mental health were not considered in these studies (396, 401). Moreover, these studies were quantitative cross-sectional surveys, and lacked the in-depth experiential accounts of qualitative investigation.

As pain is a subjective experience, and difficult to quantify, qualitative research which enables exploration of people’s subjective experiences is essential (402, 403). Qualitative research can explore the nature of the relationship between painful bodily experiences and self-concept (404). It is well suited for examining unique events and providing explanatory factors, providing contextual understandings, investigating complex phenomena such as the biopsychosocial paradigm, and giving voice to those whose views are rarely heard (405). Qualitative research is the best way to begin to study an area with little previous research as it provides information about contextual factors that might greatly alter the findings of exclusively quantitative methods (406). Qualitative research provides insights into issues that are highly relevant to a specific group of people, which has important implications for planning, developing and evaluating evidence-based interventions (407).
Self-management programmes for CLBP have been developed in western developed countries to target biopsychosocial factors in these contexts (296). Some evidence for these factors and the ensuing self-management programmes were informed by qualitative studies in these contexts (379, 380, 395, 408). No research has examined the lived experience of people living with CLBP in rural Nigeria. Four syntheses of over sixty qualitative studies (379, 380, 395, 408) explored CLBP in mostly Caucasians in developed countries. Only three of these studies were conducted outside such countries; in Israel (381), Iran (409) and South Africa (410). Feelings of distress and loss were a common finding across settings, whereas illness beliefs, treatment expectations and self-management practices differed (379, 380, 395, 408). Coping through spirituality was notable in South Africa although this may not reflect rural African patients’ views as all the patients included in this study were Caucasian females recruited through urban clinics (410). A recent focused ethnography in rural Botswana showed that people living with musculoskeletal conditions associated the causes and consequences of their conditions to physical hard labour and economic deprivation (229, 230). Therefore, to develop a self-management programme for rural Nigeria, it is important to explore the biopsychosocial factors linked to the perception, experience and expression of CLBP related disability. This chapter acknowledges the items in the consolidated criteria for reporting qualitative research (COREQ) (411).

2.2.2 Aims of the research

To explore the experiences of people living with CLBP in a rural Nigerian community.

2.3 Methodological considerations

2.3.1 Qualitative research foundations

Qualitative research entails systematically collecting, organising and interpreting textual material that originated from discourse or observation, for exploring meanings of social
phenomena in the natural context in which they were experienced by individuals, as they were experienced (412). Qualitative research is a naturalistic paradigm (413) that describes observed lived experience (414). Its characteristics include contextualisation: understanding the context from where data were obtained; understanding: linking individuals’ accounts with theories that account for them; pluralism: limited generalisability as settings may be unique and researcher’s knowledge may be a constraint on what can be known; and expression: specific methods of communication of findings (415). As opposed to quantitative research that answers the question of how many, qualitative research answers questions of what, why and how (416, 417).

Qualitative research paradigms are the worldview that guides the researcher in the choices of qualitative research methods, and the ontological and epistemological assumptions to be taken (406, 416). An etic paradigm is an outsider view of a phenomenon, completely different from that of an emic-insider view (406). Qualitative research takes an emic stance because it is characterised by results that emerge from participants’ perspective, and is idiographic because knowledge generated from it can only be ascribed to a few people. Quantitative approaches on the other hand are etic in nature because findings are determined by the researcher, and nomothetic because they can be generalised to large groups of people (416, 418).

Qualitative research is believed to be an inductive approach because it starts with research questions rather than hypotheses (418). Induction is a bottom-up approach to knowledge building because it occurs through world observations that form the foundations for theories and hypotheses. In contrast, deduction entails a top-down approach that starts with hypotheses or theories that are tested against observations in order to confirm or refute them (417). However, pure induction or deduction may not be possible as qualitative research questions, analyses and interpretations may be influenced by known facts or the literature in the researcher’s field (417). Furthermore, theories or hypotheses that form the starting point of quantitative inquiry may have been generated through induction (417). Therefore, research paradigms may be better viewed on a continuum between induction and deduction (419).
Validity in qualitative research is assured through clinical relevance, triangulation of methods and findings, respondent validation, detailing data collection methods and analysis, reflexivity and attention to negative cases; and transferability within the limits of sampling (412). Offering an insight into the emotional and experiential aspects of an illness such as the meaning of illness to patients and their families, and the attitude and behaviour of patients, their families and clinicians, which may not be exposed through quantitative research, are ways that qualitative inquiry can provide clinical relevance (420). Respondent validation occurs when qualitative results are confirmed by the participants from which the qualitative data were obtained. Triangulation entails corroboration of qualitative results from multiple information sources (e.g. observation and interviewing), researchers (e.g. independent members of a research team), and known theories (420). Triangulation tests or maximises the credibility and transferability of qualitative research, and depend on the researcher’s ability and efforts. In contrast, quantitative research depends more on outcome measures (421). This explains why reflexivity involving the exposure of the researcher’s presuppositions and experiences is core in qualitative research (421).

2.3.2 Reflexivity and the role of the researcher in qualitative research

In qualitative research, the researcher’s background, experience and stance are explicit parts of knowledge, rather than being viewed as obstacles as in quantitative methods (422). Reflexivity is central to qualitative research inquiry enabling researchers to expose their presuppositions, choices, experiences and actions during the research process (423). Acknowledging subjectivity in relation to the researcher and the participants, assures validity in qualitative research (416). Bias only arises when the effect of the researcher is ignored (414), as preconceptions are not regarded as bias, unless the researcher fails to mention them (412).

Reflexivity enables the understanding of both the phenomenon being studied and the research process, facilitating the researcher in building a sense of what is happening both in the field and in the researcher’s mind (424). Identifying the researcher’s social positioning in
relation to participants provides the reader with an understanding of the relative power between the investigator and participants, and sheds light on how the researcher views the participants and the phenomenon of interest (416). A researcher’s background will affect what they choose to investigate, methods judged most adequate, results considered most appropriate, and conclusions and how they are communicated (412). Reflexivity can also be maintained by looking at the data, or its interpretation, for competing conclusions, while bracketing the researcher’s internalised views of reality (414).

For this study, a reflexive diary and field notes were used to record the researcher’s feelings and reflections on participants’ views and actions (Appendix 1).

### 2.3.3 The researcher’s orientation

It is believed that in the social world, research results are influenced by the relationship between the researcher and the researched participants. To improve validity, qualitative researchers are nudged towards ‘empathic neutrality’ which encourages the declaration of assumptions, biases and values, while maintaining neutrality and non-judgmental approach (417).

My backgrounds are Physiotherapy and Public Health. As a physiotherapist that trained and practiced in Nigeria, my training was based on the biomedical model, and clinical emphasis was placed on functional movement and its anatomical, biochemical and physiological explanations. CLBP is thus predominantly managed biomechanically by physiotherapists in Nigeria. During my PhD, I have embraced a ‘biopsychosocial approach’ to managing CLBP from the numerous lectures, clinical postings and literature reviews undertaken as part of my PhD.

As a public health professional (Master of Public Health), my training emphasized recognising and addressing health inequality. Qualitative research was highlighted as an important pathway for addressing health inequality as it gives voice to those whose views are rarely heard. However, prior to my PhD study, I had never conducted a qualitative study. As this is my first qualitative study, I undertook literature reviews and several training courses on
qualitative research foundations, interviewing methods, data collection methods, analyses and interpretation. One of such courses was specifically on the framework approach.

2.4 Methods

2.4.1 Design

Qualitative in-depth semi-structured face-to-face individual interviews.

2.4.2 Ethical considerations

Ethical approvals were obtained from King’s College London (Ref: BDM/12/13-123) and University of Nigeria Teaching Hospital (Ref: UNTH/CSA/329/Vol.5) (Appendix 2).

2.4.3 Study setting

This study took place in Umuatugboma village in Akebugwu, in Nkanu West local government area of Enugu State. This setting is a typical rural village that is accessible from Enugu city. The village is predominantly agrarian, with most dwellers practising peasant or subsistent farming. Enugu is regarded as the oldest urban area in the Igbo speaking area of Southeast Nigeria (425).

2.4.4 Participant recruitment

A village-wide announcement, facilitated via the village head (traditional ruler), was utilised to invite interested potential participants with CLBP to meet at a local community centre. Forty-six people attended, and were given verbal and written information about the study.
Appendix 3), and allowed three days to decide whether to participate in the study. The participants were asked to return to the local community centre. Forty-four people were eligible after screening, and were interested in participating in the study. Informed consent (Appendix 4) was subsequently obtained via signature or thumb print. Purposive sampling, utilising socio-demographic factors such as age, gender and occupation, to reflect a diversity of circumstances, was used to select 35 participants. They were asked to choose a convenient day and time to be interviewed, and were subsequently interviewed in their homes.

Individuals resident in Umuatugboma village, with CLBP of apparent neuromusculoskeletal origin, aged between 30 and 69 years, which are the ages most severely affected by CLBP in rural Nigeria (24), with pain lasting for more than 12 weeks (24, 34), were selected. CLBP of neuromusculoskeletal origin was ascertained by the researcher (a qualified physiotherapist) asking potential participants questions based on an evidence based check list (Appendix 5) to rule out CLBP due to malignancy, spinal fracture, infection, inflammation or cauda equina syndrome (31-33). Diagnosing CLBP this way is congruent with the diagnostic triage recommendations by evidence based guidelines for the management of non-specific CLBP (9, 11, 12, 32). People with impaired capacity to give informed consent or participate in the interview, and pregnant women were excluded. LBP due to pregnancy is not regarded as non-specific (34). Capacity to give informed consent or participate in the interview was confirmed by the participants and their families, and subjective assessment of speech coherence by the researcher.

### 2.4.5 Procedure

The interview guide explored participants’ experiences and understanding of back pain, their coping strategies, their appraisal of the perceived success of these strategies, and expectations from treatment. The interview guide was informed by the Leventhal’s self-regulatory model of illness cognitions (179, 181), as it explored beliefs about the causes and impact of persistent pain and coping strategies. The interview guide had three sections. The first section assessed beliefs about CLBP, its impact and participants’ coping strategies. The second section assessed participants’ needs and expectations from treatment, and the last section asked participants about their daily activities. The guide was initially written in English
and then translated into Igbo following a protocol for qualitative interviews (426, 427). This involved back-translation, consultation, collaboration and independent piloting among rural Nigerian dwellers. Appropriate modifications were then made to the English and Igbo versions to produce the final versions (Appendices 6 and 7).

At the beginning of each interview, participants were requested to describe the location of their pain using a body chart (Appendix 8). In-depth semi-structured face-to-face interviews were conducted individually in the native language (Igbo) with the interviewer (the researcher, a native Igbo speaker). Two participants who were proficient in Igbo and English preferred to respond in English. Interestingly, because Igbo is rarely spoken in its pure form, most participants included English words in their Igbo narrative. Interview questions were open ended, and included probes to further clarify feelings, beliefs, attitudes and experiences.

Preliminary analysis of an interview was done to note areas for further exploration before conducting a subsequent interview in an iterative process. Each interview was audio-recorded. The average duration of each interview was one hour (ranged between 40 to 80 minutes). Data saturation was reached after 30 interviews when no new themes emerged. After the interviews, participants were given a visual analogue scale (VAS) to describe their current pain intensity, after which they were provided with refreshment and expenses for their time. Audio data were supplemented with pictures, field notes and a reflective diary. This enabled the researcher to reflexively examine her preconceptions and role as a researcher, and how these might influence responses and analysis.

2.4.6 The framework approach to qualitative research

The framework approach is a thematic analysis approach originally developed for large scale applied policy research (417). Its use has now extended into other areas including health research (419). The approach is a data management and analysis approach as it is not aligned with any particular epistemological, philosophical or theoretical approach (417). It is not a research paradigm such as grounded theory, phenomenology or ethnography (428). It has an eclectic approach that allows it to draw from different approaches such as ethnography, phenomenology, ethnomethodology, symbolic interactionism, grounded theory,
constructionism and critical theory (417). The ontological assumption of the approach is subtle realism, the belief that an external reality exists independent of peoples’ perceptions, but can only be known through peoples’ perceptions and constructions (417). Subtle realism appears as a pragmatic compromise between realist and idealist extremes due to its lack of conformity to any specific philosophical position (429).

The framework approach sits on an inductive-deductive continuum depending on specific research questions (419). For instance, a deductive approach may be used when analysis is based on a pre-existing theory, while inductive approach allows for unexpected socially-sensitive or culturally specific responses that might not have been predicted by the researcher a priori (419). Interpretation then moves beyond participants’ responses to draw from both the researcher’s interpretations and existing theories (417), while maintaining reflexivity (430).

The framework approach was developed to address common criticisms of qualitative data analysis relating to rigour, clarity and transparency (428). Its defining features include the framework matrix which allows analysis by case and code, enabling a systematic reduction of data; and the provision of clear steps to follow that makes it especially useful for large data sets in multidisciplinary research teams with varying levels of experience (419, 428). Being amenable to large data sets and novice qualitative researchers are particularly relevant considering that this was the researcher’s first qualitative study which involved many participants. The approach consists of five steps: familiarisation, constructing an initial thematic framework, indexing and sorting, reviewing data extracts in the framework matrices, and abstraction and interpretation (417). One or more of these stages may be omitted depending on the research question, the depth of analysis required, and the available time and resources (417, 419).

### 2.4.7 Data management, analysis and trustworthiness

Data were managed and thematically analysed using the framework approach (417, 419). Interviews were transcribed verbatim in Igbo by the researcher (a native Igbo speaker, and bilingual in English and Igbo). All interview transcripts were anonymised and given
identification codes. The Igbo transcripts were then forward translated into English by the researcher. This was done with the awareness that qualitative data is better analysed in the source language to minimise loss in translation (426, 431). Analysis of the English transcripts was a pragmatic decision to ensure that all stages in the analytical process could be validated by my supervisors that are native English speakers.

Steps were therefore taken to ensure that meaning was not lost in translation. After the forward translation of the Igbo transcripts to English, one interview transcript was selected at random (using computer generated numbers), and back translated from English to Igbo. An expert panel comprising clinicians, researchers and an independent British resident Igbo speaker compared the original and translated versions of the transcript, to ensure that content and meaning were retained. Furthermore, respondent validation was carried out with a randomly selected participant, in line with best practice (431-434). However, translation has negligible effects on qualitative analysis when conducted within the native language and culture of researchers (433). Furthermore, the framework approach to data management ensures systematic, rigorous and transparent qualitative data analysis (419, 435).

English transcripts as well as pictures, field and reflective notes were entered into NVivo version 10, QSR international, Melbourne, Australia. Data management began with inductive coding which was descriptive and grounded in the data. A code book, with definitions of codes was developed and was used to organise the data. These steps were validated by my supervisors who compared the codes and their definitions with the interview transcripts, and ensured that the codes reflected the qualitative data. The organised data were then used to inductively develop analytical categories validated similarly by the research team. Another code book with definitions of the categories was developed and used to organise the data. These steps further ensured familiarisation and immersion in the data in an iterative process. An independent researcher in Nigeria coded a randomly selected Igbo transcript to further validate the coding process.

The data, organised within the analytical categories, were then used to develop the initial thematic framework which was again validated by the rest of the research team. The data were indexed by applying the initial thematic framework to the rest of the data. These were
summarised and displayed in the final framework matrices, in which each theme was represented in rows and columns. Each row corresponded to a participant’s transcript, and each column to each subtheme within a theme. Finally, there was abstraction and interpretation of data using the framework matrices to develop explanations which produced the final narrative. Interpretation of results was facilitated by the systematic generation of themes via the framework approach (417, 419), and a practitioner-as-researcher model (436), as the researcher’s past experiences as a clinical Physiotherapist in this context might have enhanced meaning and understanding.

2.5 Results

2.5.1 Participants

Table 2.1 below shows that all participants were peasant farmers on a full-time or part-time basis. Some participants were full time farmers, whereas other participants were either predominantly farmers and combined this with another part-time occupation, or had a different full time occupation such as welding but did some part-time farming in addition. Manual workers included farmers, welders, mechanics/panel beaters, masons, butchers and furniture makers. Non-manual workers included a clergyman and barber. A majority of the participants found it difficult to comprehend the VAS, possibly due to low literacy levels. Therefore, pain intensity could not be ascertained, suggesting that numeric pain rating scales may be better for future studies in this population.
Table 2.1: Socio-demographic characteristics of the participants

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGE (YEARS)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-39</td>
<td>8</td>
<td>26.7</td>
</tr>
<tr>
<td>40-49</td>
<td>11</td>
<td>36.7</td>
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<td>50-59</td>
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</tr>
<tr>
<td>60-69</td>
<td>7</td>
<td>23.3</td>
</tr>
<tr>
<td>SEX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>15</td>
<td>50.0</td>
</tr>
<tr>
<td>Female</td>
<td>15</td>
<td>50.0</td>
</tr>
<tr>
<td>MAIN OCCUPATION</td>
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<td></td>
</tr>
<tr>
<td>Manual workers</td>
<td>14</td>
<td>46.7</td>
</tr>
<tr>
<td>Non-manual workers</td>
<td>3</td>
<td>10.0</td>
</tr>
<tr>
<td>Traders</td>
<td>7</td>
<td>23.3</td>
</tr>
<tr>
<td>Civil servants/retired civil servants</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>RELIGION (CHRISTIAN DENOMINATION)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protestant Pentecostal</td>
<td>18</td>
<td>60.0</td>
</tr>
<tr>
<td>Catholic</td>
<td>8</td>
<td>26.7</td>
</tr>
<tr>
<td>Methodist</td>
<td>3</td>
<td>10.0</td>
</tr>
<tr>
<td>Anglican</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>MARITAL STATUS</td>
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<tr>
<td>Married</td>
<td>26</td>
<td>86.7</td>
</tr>
<tr>
<td>Widowed</td>
<td>3</td>
<td>10.0</td>
</tr>
<tr>
<td>Single</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>EDUCATIONAL LEVEL COMPLETED</td>
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<tr>
<td>Primary</td>
<td>11</td>
<td>36.7</td>
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<tr>
<td>Tertiary</td>
<td>7</td>
<td>23.3</td>
</tr>
<tr>
<td>Secondary</td>
<td>6</td>
<td>20.0</td>
</tr>
<tr>
<td>None</td>
<td>6</td>
<td>20.0</td>
</tr>
<tr>
<td>LITERACY (ABILITY TO READ AND WRITE)</td>
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<td></td>
</tr>
<tr>
<td>Illiterate (inability to read and write)</td>
<td>13</td>
<td>43.3</td>
</tr>
<tr>
<td>English</td>
<td>9</td>
<td>30.0</td>
</tr>
<tr>
<td>English and Igbo</td>
<td>8</td>
<td>26.7</td>
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<tr>
<td>CO-MORBID CONDITIONS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td>4</td>
<td>13.3</td>
</tr>
<tr>
<td>Diabetes</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>Knee osteoarthritis</td>
<td>1</td>
<td>3.3</td>
</tr>
</tbody>
</table>

2.5.2 Analytical themes

Table 2.2 below shows the five themes and thirteen subthemes generated from the thematic analysis of data using the framework approach. These themes, subthemes and the narrative emerged from the data organised within the following analytical categories: aggravating and relieving factors, causal beliefs, coping strategies, cultural and environmental factors, impact on life, living dead, perceived needs and expectations, responses, self-concept, self-
management and medical management, social and gender roles, spiritual beliefs, understanding of health and illness, understanding of pain.
### Table 2.2: Analytical themes

<table>
<thead>
<tr>
<th>Themes</th>
<th>Social construction of back pain as a disease of hard labour and deprivation</th>
<th>CLBP impacts on the family and mental health</th>
<th>Coping strategies were driven by beliefs</th>
<th>The role of spirituality</th>
<th>Dissatisfaction with health care</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subthemes</strong></td>
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<tr>
<td>Back pain is associated with the ageing process</td>
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<tr>
<td>Impact on gender roles</td>
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<td>Showing weakness appears unacceptable</td>
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<tr>
<td>Spiritual beliefs represent causal explanations for back pain</td>
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<tr>
<td>Dissatisfaction with conventional health care</td>
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<tr>
<td>Back pain had a seasonal presentation</td>
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<tr>
<td>A life of ‘living death’</td>
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<td>Drugs are the legitimate form of treatment</td>
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<tr>
<td>Spirit-body dualism</td>
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<tr>
<td>Dissatisfaction with available alternative health care</td>
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<tr>
<td>Active lifestyle modification is only a preventive strategy</td>
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<tr>
<td>Pain acceptance and support through spirituality</td>
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<td></td>
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<tr>
<td>Expectations still focused on ‘cure’</td>
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</tbody>
</table>
1. **Social construction of back pain as a disease of hard labour and deprivation**

The participants associated chronic back pain with hard labour and deprivation, which was thought to be inevitable for rural dwellers in Nigeria; and compared themselves unfavourably with urban dwellers.

> ‘How will someone not have sickness? No good environment, no good food, nothing, nothing, no good drugs...you know in villages in this our country; we are in trouble due to suffering...you will be doing hard labour, but in the towns they are okay.... but in this village, a 30-year-old has sagged... but in the towns, if you see an 80-year-old you won’t believe it, she is living fine...’ (P2, Single female, aged 30 years, full time trader, Pentecostal Christian).

These adverse conditions were explained in terms of a combination of factors such as prolonged involvement in manually demanding jobs, lack of rest, child bearing and rearing, poverty, poor nutrition and lack of social support. Poor environmental and socio-economic conditions, such as low paid jobs, stress and worry about the future, were believed to necessitate long working hours, to increase earnings in order to have a better standard of living.

> ‘...our pain is due to over working and lacking assistance...’ (P4, Married Male, aged 54 years, welder, Pentecostal Christian).

Participants therefore felt that a life without back pain was only achievable by changing their jobs to less manually-demanding occupations and improving their nutrition. Some participants reported that they stopped working or changed their jobs due to CLBP. Many participants, especially the males, reported they experienced pain only during or immediately after working which resolved after days of not working. However, the perceived helplessness of their socio-economic situation contributed to feelings of isolation, hopelessness and frustration.

> ‘...any time that I’m able to get money, and stop this job, and start a business, it would stop... also good food... Good food...good food cures sicknesses. ...I also need money...I need money’ (P19, married male, aged 33 years, full time welder, Methodist).

The need to change their occupation was followed by the expectation that an alternative job should be provided by the government.

> ‘...Not having a better job when you should work...I am begging the government...a way that the government will bring to help us, because a lot of
people are suffering from this pain...’ (P17, married male, aged 46 years, full time welder, Catholic).

Participants felt that improving their nutrition meant adopting a less-carbohydrate based diet, with more protein, fruit and vegetables.

‘...what I need are all these fruits that give good health, because there are some foods we were told to reduce how much we eat. Like cassava, anything that has too much starch...’ (P16, widowed female, aged 40 years, full time teacher, Methodist).

This type of nutrition was perceived to be expensive and beyond their reach.

‘...fruits are too expensive here...because people in the villages sell all their fruits in the towns for money...so fruits are cheaper in the towns than in the villages....’ (P20, married female, aged 35 years, full time civil servant (computer operator), Pentecostal Christian).

They therefore hoped that aid would be provided by the government to address these needs, without which they had no hope of recovery from their back pain.

‘...I am begging the government... the way our health is being treated in this country isn’t good...’ (P14, married male, aged 45 years, full time mechanic, part-time farmer).

A better nutrition could then sustain them in their ‘new’ less manually-demanding jobs.

‘...that kind of food can now support the light jobs’ (P3, married male, aged 42 years, full time Mason, Pentecostal Christian).

Back pain is associated with the ageing process

CLBP was perceived as a sign of normal ageing by the older participants, but they had bleak expectations about the future as they grew older and became unable to sustain their livelihood in the perceived adverse conditions of the rural areas.

‘...I don’t agree that it is a serious ill health... it’s due to the way we work and the fact that we are getting older’ (P6, Married Male, aged 44 years, full time furniture maker/pastor, Pentecostal Christian).

Conversely, the younger participants associated CLBP with premature ageing, similarly related to rural habitation.

‘...I am still a young woman...people of my mother’s age...will stand for 30 minutes...but me, I won’t be able to stand up for 30 minutes...’ (P18, married female, aged 38 years, full time trader, Pentecostal Christian).
The younger participants had catastrophic expectations about the future which they expected to be unbearable due to the perception that ageing would make them become completely incapacitated.

‘...for me to start now to have back pain, when a person starts conceiving or starts having children, or starts getting old, you then know that the person may not be able to get up from sitting...’ (P2, Single female, aged 30 years, full time trader, Pentecostal).

Back pain had a seasonal presentation

Participants associated CLBP with the tropical climate in Nigeria. CLBP was perceived to be worse during the rainy season and relieved during the dry season. The rainy season is when farming activities normally occur in rural Nigeria, which was associated with CLBP.

‘...You know that as we are in the village like this, everything has a season, it gets worse during the rainy season. After doing hard labour...you would do morning farm work and then do the evening farm work...no rest...when work is reduced, pain is relieved like during the sunny weather...’ (P2, Single female, aged 30 years, full time trader, Pentecostal).

Additionally, the rainy season is a period of flooding which some participants believed caused back pain.

‘...some doctors said that it is rheumatism...caused by bad water that enters the body...because the skin has holes...especially during the rainy season...if I put my legs into muddy water...it makes the pain worse...’ (P18, married female, aged 38 years, full time trader, Pentecostal).

Some participants described this period as a time of reduced business activities and less financial profit, hence possibly a period of further deprivation and anxiety for them.

‘...this rainy season contributed to our not going to the market regularly. If it is during the dry season, we go to the market almost every day...’ (P7, Married female, 34 years, full time trader, Pentecostal).

2. CLBP impacts on the family and mental health

CLBP had a considerable impact on the family and mental health, characterised by clear culturally defined male and female gender roles.
Impact on gender roles

Women felt that having CLBP prevented them from fulfilling their community’s socio-cultural expectation of conceiving and looking after children, and providing physical and spiritual sustenance.

‘...I feel very sad; I feel sad because I can no longer cook his (husband) food...’ (P1, married female, aged 69 years, Pentecostal); ‘...like now if there is a church outing...I won’t be able to...go and pray...’ (P20, Married female, aged 35 years, full time civil servant-computer operator, Pentecostal).

Young married females, who had been trying unsuccessfully to conceive, felt reduced fertility to be a consequence of their CLBP.

‘...we are looking for the fruit of the womb...I feel that CLBP is part of what is preventing it...’ (P8, married female, aged 47 years, voluntarily retired teacher, Pentecostal).

This was sometimes related to a symptom described as ‘hotness’ in the back.

‘...where this has really made me sad is that it has not allowed me to get pregnant...because people say that back pain makes it difficult for people to get pregnant...because of the hotness...’ (P18, married female, aged 38 years, full time trader, Pentecostal).

Maintaining physical intimacy was viewed as a sign of masculinity in this rural community, and was thought to be affected by CLBP.

‘...and possibly the time you are supposed to relate with your wife, you will be complaining, I am tired. That is the core...the most...and... Yes, that is the most touching area...’ (P15, married male, aged 50 years, full time clergy/teacher, Pentecostal).

Family provision was viewed similarly and when men felt they were unable to achieve this because of their CLBP, they felt emasculated and frustrated.

‘...It means that you are not able to do the work that supports your existence. With that you will see that there will be no money, there will be no food until I recover and start going to work...’ (P3, married male, aged 42 years, full time Mason, Pentecostal).

The inability to fulfill the male gender roles affected spousal and family relationships.

‘...brings problems into the home...because the money isn’t enough...’ (P17, married male, aged 46 years, full time welder, Catholic).
A life of ‘living death’

Participants described their experience of CLBP within a rural Nigerian context as a life of ‘living death’ associated with unbroken misery and hopelessness. They felt that, although they knew what was causing their back pain, they were powerless to modify them. Some participants also felt that having back pain led to pain in other sites, which was understood as the disease spreading throughout their body.

This perspective led to feelings of hopelessness followed by feelings of severe depression, which participants described using the Igbo word for ‘tiredness’ as there is no word for depression in Igbo.

‘...it is the feeling of tiredness, tiredness, tiredness. Sometimes I feel tired.... then I will get very sad, very sad, very sad, when sometimes I don’t get myself, I get very sad, very sad...’ (P1, married female, aged 69 years, Pentecostal); ‘...it makes you.... tired...you will be getting very tired. That tiredness is depression...’ (P15, married male, aged 50 years, full time clergy/teacher, Pentecostal, responded in English).

For some participants, the word ‘tiredness’ signified that they were tired of continuing to live in this world.

‘...everything will tire you....in short you are tired of living in this world...’ (P15, married male, aged 50 years, full time clergy/teacher, Pentecostal).

This led to few participants preferring actual death to this life of ‘living death’ which was particularly pronounced in people who became dependent as a result of having CLBP.

‘...I am suffering severely ...rather than not being able to feed myself... rather than living a life without rest...living in death...let Him (God) take my life...’ (P11, Widowed female, aged 67 years, full time farmer, Pentecostal).

3. Coping strategies were driven by beliefs

Some participants understood CLBP as something that had come to steal the very essence of their existence, and adopted coping strategies that were belief-derived.

Showing weakness appears unacceptable

Some participants coped with their pain by ‘escaping from the self’ through increasing activity levels to avoid spending time alone thinking. Others coped by ‘escaping from
others’ through withdrawal/seclusion. ‘Escaping from the self’ seemed stimulated by feelings of extreme distress.

‘...when I’m alone, what I feel like doing is going out... It’s not my thoughts; it’s my ill health and my weeping. It comes into my head, I say to it...come let’s go out...’ (P11, Widowed female, aged 67 years, full time farmer, Pentecostal).

‘Escaping from others’ appeared to be provoked by shame and perceived negative perceptions.

‘...because when they look at you, they start laughing at you...’ (P9, married male, aged 35 years, full time trader, Methodist).

‘Escaping from others’ also appeared to be derived from other people expressing doubts about their pain.

‘...because when you tell people how it pains you, they will be telling you ‘Is it possible, you that look so good?’ (P2, Single female, aged 30 years, full time trader, Pentecostal).

Some participants coped by not disclosing their CLBP to people who were outsiders to them.

‘...apart from my wife...I don’t tell other people...’ (P21, Married male, aged 45 years, full time panel beater/mechanic, Catholic).

Spiritual leaders with CLBP concealed it from their congregation because they believed this would hinder their faith and prevent their healing.

‘...Ours is faith work...based on the fact that I am a clergyman; I don’t want it to be exposed...as a pastor, I use my experience to encourage them but I don’t tell them that I have back pain too...’ (P15, married male, aged 50 years, full time clergy/teacher, Pentecostal).

Other participants sought emotional support from members of their nuclear family.

‘...My wife usually assists me...’ (P14, married male, aged 45 years, full time mechanic, part-time farmer, Catholic).

A few participants coped by seeking support from distant friends who were seen as more supportive than their extended family who they felt were ‘enemies’ because of their lack of support and mockery of them.

‘...My siblings will start mocking me...it is not everywhere that I go... now the other village...I go there more often because they respect what I say...’ (P9, married male, aged 35 years, full time trader, Methodist).
Drugs are the legitimate form of treatment

Most participants depended on analgesic drugs to perform their normal activities. This was especially true for those who believed that their occupational duties caused and aggravated their CLBP.

‘...Well as far as it is because of my job that I have my back pain...we go and take drugs...and continue doing our work...’ (P17, married male, aged 46 years, full time welder, Catholic).

Furthermore, it seemed a cultural norm in this community that diseases were legitimately treated and ‘cured’ through medication. Hence, many participants reported a constant struggle to be able to afford the drugs on which they depended to function normally.

‘...I get drugs for pain...seems like we are constantly on drugs...’ (P22, married female, aged 54 years, full time trader, Pentecostal).

Other participants felt compelled to depend on drugs for relief because this was a salient belief in their community.

‘...people will be asking you ‘have you taken drugs...?’ (P2, Single female, aged 30 years, full time trader, Pentecostal).

Active lifestyle modification is only a preventive strategy

A very few participants, who did not consider themselves to be ill with back pain, adopted exercises and pacing as preventive rather than ‘curative’ strategies. They also tended not to use drugs or seek any other form of treatment for their back pain.

‘...I haven’t gone to the hospital because of it because...I haven’t understood it as sickness...you will do exercise...which may help sometimes...I need to do these exercises for prevention...and you won’t give your back a job that is too much for it...’ (P6, Married Male, aged 44 years, full time furniture maker/pastor, Pentecostal).

A few other participants attempted exercise or pacing although they did not perceive these as treatment.

‘...there is something else I usually do, I might also do exercise...it reduces the pain...that is the only thing that has worked...’ (P6, Married Male, aged 44 years, full time furniture maker/pastor, Pentecostal); ‘...what makes it better is if I’m working and I stop for a while. If the pain is too much, I stop work for a while.'
Rest for some time…’ (P10, married male, aged 48 years, full time welder, Pentecostal).

One of the participants was the only one that had seen physiotherapists for his back pain. This participant had a biomedical model of CLBP, and hoped to be cured of it through biomedical health care.

‘...I am careful how I position myself to do my work...I also do the exercises the Physiotherapists gave me...hoping for a cure one day’ (P14, married male, aged 45 years, full time mechanic, part-time farmer, Catholic).

4. The role of spirituality

Spirituality was dominant in this population, influencing not only the participants’ beliefs about their CLBP, but also their coping strategies and the impact of CLBP.

Spiritual beliefs represented causal explanations for back pain

Spiritual beliefs were offered as causal explanations for CLBP by a few participants, all of whom were females. They believed that CLBP was maintained by spiritual forces from close associates.

‘...some are your neighbours, some are from your father’s home from where you were married, then those from the community where you are currently married will be doing their own part. Your contemporaries will be doing it too...but Jehovah returns to them all their negative projections because that is not what I think of them...I am friends with God’ (P13, married female, aged 60 years, Pentecostal).

However, participants felt that those close to God should be protected from CLBP.

‘...God said my body is the temple of God not the temple of sickness...’ (P7, Married female, 34 years, full time trader, Pentecostal).

This made participants with CLBP question their standing with God, as they felt that serving God faithfully should have protected them from CLBP.

‘...If I’m told to do this in church I do it, if I’m told to do that I do it, I have never turned my back on You God...' (P11, Widowed female, aged 67 years, full time farmer, Pentecostal).
Some participants, who did not hold these beliefs initially, began to consider them after several conventional and alternative treatments for managing their back pain had failed.

‘...I have tried everything...when someone is unable to explain what is making the person...have pain...could it be spiritual?’ (P5, married female, aged 62 years, full time trader, catholic).

This perception was often associated with emotional distress which was even more pronounced in those whose pain affected their ability to engage in religious activities, commonly adopted as coping strategies.

‘...to stand up and pray to God...I would have no strength to pray due to the pain...that is what hurts me the most... ...’ (P18, Married female, aged 38 years, full time trader, Pentecostal).

**Spirit-body dualism**

Some participants had complex dualistic beliefs about their health, and simultaneously viewed themselves as healthy and ill. These participants saw themselves as two radically distinct beings: their spirit, which they viewed as healthy, and their bodies which was ‘ill’ due to CLBP. Other participants held non-dualistic beliefs and viewed themselves as either having good health or poor health due to their back pain.

Participants who had non-dualistic beliefs about their health did not appear to be influenced by spiritual beliefs. They included those who believed pain was a sign of ill-health and those who felt that pain was only associated with their occupational activities.

‘...I am ill because of all these pains...’ (P20, married female, aged 35 years, full time civil servant-computer operator, Pentecostal). ‘...now, I don’t see back pain as ill health, it came about because of my job...and stops when I don’t work’ (P3, married male, aged 42 years, full time Mason, Pentecostal).

Those who believed they could still be functional regardless of their pain also did not think of themselves as being ill.

‘...I am healthy because I still manage to go to work...it is only pain’ (P6, Married Male, aged 44 years, full time furniture maker/pastor, Pentecostal).
Conversely, the participants who expressed spirit-body dualism were those who viewed pain as a sign of ill-health but nonetheless thought of themselves as healthy because of their spirituality.

‘...by confession I am healthy...(laughs)...because...what I mean by that is that by faith I am healthy...in reality, there are some remnants of certain things that bring pain into my body...’ (P15, married male, aged 50 years, full time clergy/teacher, Pentecostal).

**Pain acceptance and support through spirituality**

On experiencing back pain, participants prayed first, and then sought treatment from local ‘chemists’ (unqualified pharmacists who dispense drugs) for medication, then herbs when these did not work. The majority then returned to prayer and coped by seeing back pain as a ‘cross’, thereby deciding to live with it as commanded by God until He decided to heal them.

‘...Carry your cross and follow me’ and that is part of the cross... I might be in severe pain yet I will still muster courage and do my work to the end...’ (P15, married male, aged 50 years, full time clergy/teacher, Pentecostal).

**5. Dissatisfaction with health care**

Many participants felt that mainstream health services would be successful at ‘curing’ their back pain.

‘...if I go to the hospital, I know that they will do a very good check-up, then they give me drugs...after taking drugs for like 2, 3 days, it will be cured...’ (P4, Married Male, aged 54 years, welder, Pentecostal).

However, many participants reported that this type of management was unattainable for various reasons, which made them seek alternative treatment.

**Dissatisfaction with conventional health care**

Participants felt that conventional health care services were inaccessible to them due to both cost and distance.

‘...there is no money that is why we have not gone to the hospital to treat it...’ (P21, married male, aged 45 years, full time panel beater/mechanic, Catholic).
However, those who had sought conventional treatment felt that Nigerian doctors were untrustworthy due to their failure in curing their back pain.

‘...I believe Nigerian doctors are not sincere, they just want money’ (P2, Single female, aged 30 years, full time trader, Pentecostal).

They also felt that the bureaucracy in the Nigerian hospital services prevented them from accessing conventional health care.

‘...if you go to XX (hospital), before you are able to see a doctor, it is very difficult, they keep moving you from one office to another office, so...I haven’t gone...’ (P7, Married female, 34 years, full time trader, Pentecostal).

The fear of conventional health care prevented one participant from seeking help because he felt that the doctor’s diagnosis would make his condition appear to be more severe than it actually was, in a bid to obtain more money from him. He felt he could not cope with the associated costs and distress.

‘...everybody is looking for money nowadays, money is important to everyone, especially in our country Nigeria, everyone wants to succeed, to achieve this and that...if only I can go to the hospital, and the doctor tells me what I can do...but there are some of them you will go to, they start asking you for money...do this and do that. Some of them would like to admit you to their hospital so that your illness appears serious, more serious than it actually is, because they are professionals and this makes people afraid...’ (P10, married male, aged 48 years, full time welder, Pentecostal).

Dissatisfaction with available alternative health care

Participants adopted alternative types of treatment due to perceived ‘failure’ of conventional treatment.

‘...I have gone to herbalists...even the computer people came to our village the other day...they decided to check my body...still the back pain continued...’ (P20, married female, aged 35 years, full time civil servant (computer operator), Pentecostal).

The failure of these alternative therapies to ‘cure’ their back pain led to participants blaming the alternative practitioners, and subsequently hoping for an opportunity to access better conventional treatment.

‘...you go to this chemist and take this drug, tomorrow you go to another chemist and take another drug...you still have not got an answer...I haven’t had enough money to go to a good hospital...if you go to a good hospital that is not like all
these rubbish hospitals, they will give you a huge bill, but you will be treated...’
(P4, Married Male, aged 54 years, welder, Pentecostal).

Expectations still focused on ‘cure’

Following the ‘failed’ conventional and alternative treatments that participants received, their expectations for their CLBP were still focused on ‘cure’. This was either spiritual healing expected to come directly from God, or through the people that God would send to them.

‘...Only God can make it (CLBP) to stop...’ (P16, widowed female, aged 40 years, full time teacher, Methodist). ‘...Perhaps God can use you people as instruments to cure our pain...’ (P15, married male, aged 50 years, full time clergy/teacher, Pentecostal).

The latter was possibly influenced by the participants’ perception of the researcher as someone who had returned from the UK (Reflective diary, 10/9/2013). Participants also had healing expectations based on a biomedical model. The transient effects of medication encouraged the negative perception that this was due to sub-standard drugs.

‘...We don’t have good drugs in Nigeria at all...all are fake’ (P19, married male, aged 33 years, full time welder, Methodist).

This belief influenced their hopes for future therapy, such as accessing ‘foreign’ conventional treatment and ‘foreign’ drugs that could ‘cure’ their pain.

‘...I called my sister in America...there is one of my brothers...in New Zealand...he said he would come back with drugs... all these foreign drugs, if you take them once, you are sure of what you have taken...’ (P17, married male, aged 46 years, full time welder, Catholic).

However, this response may have been influenced by participants’ views of the researcher as someone who had returned from the UK with extra knowledge or resources (Reflective diary, 10/9/2013).
2.5.3 Chronic low back pain model in rural Nigeria

Figure 2.1 below illustrates the model formulated from the results of this study. Participants’ beliefs about their CLBP such as associating back pain with manual labour and deprivation, infection or degeneration, rural-urban divide in terms of socio-economic status, health care provision and cost of CLBP, and the spiritual and cultural beliefs about CLBP may have directly influenced the impact of back pain on male and female gender roles.

In response to the impact of CLBP on gender roles, participants adopted either adaptive or maladaptive coping strategies which appeared to be stimulated by specific beliefs. The few participants that took up adaptive coping strategies appeared to be stimulated by positive beliefs such as not regarding CLBP as an illness, and accepting pain and social support through spirituality. The adaptive coping strategies included the relinquishment of the sick role which may have enabled active behavioural adaptation such as exercising and pacing activities. These participants seemed to have an internalised locus of control with no expectations of being cured of their CLBP as they did not regard it as an illness. They did not seem to be emotionally distressed and appeared to have less disability.

On the other hand, a majority of the participants adopted maladaptive coping strategies, stimulated by their view of CLBP as an illness, or a spiritual causal understanding of CLBP, or a biomechanical understanding associated with their occupation. The maladaptive coping strategies were facilitated by the participants’ unrealistic expectations of getting their CLBP cured or changing their occupation. These may have facilitated drug dependence and increased alternative health care use, reflecting an externalisation of locus of control. As these passive coping strategies were not effective, participants attempted to counteract their pain-related disability by increasing their activity levels—an attempt to ‘fight back against pain’. These maladaptive coping strategies may have increased disability, pain, emotional distress, hopelessness and reduced quality of life.

Following the impact of CLBP on their lives, participants assessed the effectiveness of their coping strategies which led to their dissatisfaction with both conventional and alternative health care in Nigeria, further increasing psychological distress and helplessness.
**Figure 2.1: CLBP model in the rural Nigerian community**

- **CLBP BELIEFS**
  Manual labour/deprivation, infection/degeneration, health care costs, rural-urban divide, spirituality, culture

- **MALADAPTIVE COPING**
  Unrealistic expectations of cure/changing jobs, passive coping strategies, overworking, drug dependence, increased alternative health care use

- **CLBP IMPACT**
  Disability, pain, emotional distress, hopelessness, reduced quality of life

- **CLBP IMPACT**
  Male roles
  Female roles

- **CLBP not seen as an illness**
  Pain acceptance through spirituality

- **CLBP regarded as an illness**
  Spiritual causal beliefs

- **ADAPTIVE COPING**
  Relinquishment of sick role, active behaviour adaptation; pacing, internalised locus of control, social support, reduced emotional distress, reduced disability

- **Appraisal of coping strategies**
  Dissatisfaction with conventional and alternative health care
2.6 Discussion

2.6.1 Summary and interpretation of findings

This is the first study to explore the experiences of people living with CLBP in a rural Nigerian community. It found disparate beliefs about CLBP, wide-ranging impacts, multiple coping strategies and dissatisfaction with prevailing healthcare, suggesting a complex mixture of socio-cultural and psychological factors in this community.

Spirituality was highly relevant to most of the participants as evidenced by a strong belief in the ‘divine healing’ of physical illness. A spiritual explanation of illness is supported within African culture with the attribution of misfortune to ‘closely related enemies’ (437) or ‘spiritual forces’ (438). This shapes the collective understanding of health and illness (391, 439, 440), with illness often interpreted as a sign of discord between man and God (410). These attributions may negatively influence emotions which can have an adverse effect on clinical outcomes (441). The influence of spirituality on the impact of CLBP has also been reported in South African patients, where the expectation of a pain-free after life was found (410). This spiritual dimension of the experience of CLBP may also be linked to the subtheme, ‘a life of living death’, as some participants hoped God would end their life as a way out of pain, potentially fostering suicidal ideation. However, high degrees of religiosity may decrease suicide risk, as suicide is considered sinful (442). The apparent link between a ‘life of living death’ and ‘tiredness’, plus the lack of an Igbo word for depression, illustrate how language/culture may influence somatisation, emotions and catastrophising. The expression of psychological states using bodily cues has been reported to reinforce physical symptoms (124).

Spirituality may however play an adaptive role in influencing spirit-body dualism. Spiritual health was reflected in the belief that faith made all things possible, therefore if participants believed that they were healthy, this might facilitate a relinquishing of the sick role, leading to more active self-management with an internal locus of control (443). In contrast, a dualistic view of the self has been reported to have little rehabilitative purpose in western settings where patients viewed their painful bodies as an external
threatening object distinct from a valued sense of self (386, 395). Spirituality leading to pain acceptance may be more adaptive in CLBP than spiritual healing expectations which engender frustrations when the expected healing does not occur. Acceptance of chronic pain is associated with less pain, disability, depression, anxiety, and superior work status (186).

Corroborating this study, previous studies have reported that culturally specific expectations and gender roles such as ‘duty to family’ and lack of understanding from family/community can reinforce stress in people with CLBP (409). In developed countries, reduced family support was purported to result from the compromised ability to perform expected roles, especially as patients’ pain could not be seen by others who became unsympathetic (379, 380, 395, 408), resulting in anger and guilt (444). In this study, unsupportive extended family members were seen as ‘enemies’, especially when they seemed to be mocking participants. This might be linked to the concept of ‘enmity’ in Africa (445) because constructions of the self in many African settings emphasize the risks and dangers inherent in interdependence (437). In developed countries, a few studies have reported solidarity between spouses, and suggested that this has a positive and mediating role in CLBP (446, 447), described as ‘we-ness’ when pain was a shared experience (395).

‘Escaping from the self’ has been described in other studies where patients with CLBP sometimes exceeded their functional capacities in an attempt to fight back against pain (387, 388, 448-450). ‘Escaping from others’ was reflected in regulating the ‘assault on the self’ (380), described as a traumatising challenge to personal identity (379, 387) aimed at minimising exposure to situations which revealed personal limitations. This might exacerbate social isolation and depression (380, 395). Dismissal of pain experience by participants’ close companions or colleagues because participants looked ‘healthy’, has been reported as malingering in developed countries (383, 402, 404, 451), possibly linked to existing social welfare in those countries. Whereas most participants in this study adopted strategies for pain reduction, in other studies, patients have ignored or denied their pain, continued with normal activities and not sought therapy (381). Medication use is often adopted reluctantly by patients in developed countries (451) due to concerns about dependency, side effects and impact on the ‘self’ (452). In contrast, participants in this study requested a drug-based cure, which may be
associated with the acute biomedical health care model predominant in Africa (453). This highlights the need to shift focus to more effective biopsychosocial approaches such as active self-management (257, 259). Notably, self-management practices such as exercise, postural awareness and pacing were only adopted as preventive rather than curative strategies by the few participants who felt they were not actually ill.

The reported influence of the Nigerian tropical climate, implied in the seasonal presentation of CLBP, suggests the cyclical nature of CLBP with implications for epidemiological studies of CLBP in rural Nigeria. The cyclical experience of CLBP increases distress when interpreted as unpredictable (379, 380, 408). The negative perception of the Nigerian rural-urban disparity (239), similar to findings in rural Western Australia (454), was associated with poor Nigerian rural health services (231, 232, 234, 235). This may complicate the impact of CLBP when combined with an acute biomedically oriented urban health care services (453). The biomedical model can be associated with less empathic care due to a lack of acknowledgement of psychosocial issues (455), and can lead to unrealistic expectations of ‘cure’ (456). However, adverse clinical outcomes are also reported when patients feel that their CLBP will remain persistent (457). Discrepancies between patients’ expectations of a ‘cure’ and the received treatment usually result in dissatisfaction (407). When a ‘cure’ was not achieved, participants in this study sought alternative services perceived to be cheaper and more accessible. Evidence suggests that patients’ choice of practitioners is unrelated to health professionals’ formal qualifications, therapeutic approaches, treatment practices or the scientific basis of therapeutic practices (458). Research has suggested that patients from developed countries who accepted an active involvement in CLBP management were more satisfied with treatment, and less likely to demand a cure (407).

The distress experienced by the participants was due to the persistence of symptoms despite multiple treatments but has often occurred due to the lack of a specific diagnosis in Western patients (395). This might be because the participants in this study received specific ‘diagnoses’ which might have reinforced their search for ‘cure’, whereas western patients often received non-specific diagnoses leading to their perception of treatment as unsatisfactory (379, 395). Participants in this study perceived doctors as untrustworthy, alternative practitioners as ‘incompetent’, and Nigerian drugs as ‘fake’
since they failed to ‘cure’ them of their back pain. There was little stigma associated with the management of CLBP possibly due to the predominant biomedical management of CLBP. Inadequate acknowledgement of psychosocial factors in the biopsychosocial management of CLBP can be associated with patients feeling rejected if health professionals imply their pain is somehow not real or ‘in their head’ (379, 380, 395, 408). Therefore, explanations to patients detailing how psychosocial factors influence pain perception in the nervous system may prove useful (459).

The biomechanical model of CLBP demonstrated by the participants in this study is common across most countries. This understanding was often expressed as primarily a mechanical injury (381, 383, 404, 460), or associated with habitual work-related tasks (461); sometimes associated with poor knowledge of correct posture/lifting techniques (409). In rural Botswana, people associated the causes and consequences of musculoskeletal conditions to physical hard labour (229, 230). Biomechanical understanding of CLBP has been suggested to elevate fear-avoidance beliefs, anxiety, pain intensity, pain catastrophising, hypervigilance, maladaptive illness perceptions and disability (68, 148, 173, 174, 176, 462). Moreover, there is limited evidence linking biomechanical factors to the adverse impact of CLBP (223). Associating CLBP with ageing led to catastrophic thinking, as reported in previous studies (381, 386, 409, 410, 463). This was more pronounced in the younger participants. Perceptions of premature ageing are often reinforced by impaired mobility (404) leading to despair, because of the expectation that health deteriorates with ageing (388). This understanding of CLBP was also linked to the negative perception of rural-urban disparity in Nigeria (239).

2.6.2 Strengths and limitations

The strength of this research is that it is completely novel as it is the first study to explore the lived experience of people living with CLBP in rural Nigeria. Other strengths include the rigorous systematic data collection and analysis, detailed description of the methods and the orientation of the researcher, reflexivity and respondent validation, as well as the findings being substantiated by a multidisciplinary team. As expected of qualitative research, the generalisability of this study can only be ascribed to a few people,
therefore more studies should explore meaning in other African contexts. Pain intensity could not be ascertained with the VAS. Therefore, subsequent studies may require numeric scales of pain intensity. This study is only suggestive of possible factors associated with CLBP, therefore a quantitative investigation is warranted to determine the generalisability and relative contribution of these factors to CLBP disability.

### 2.7 Conclusions

This is the first qualitative study that focused on people living with non-specific CLBP in a rural African community. The burden it has uncovered suggests that much more research is warranted in this area. Participants’ beliefs resulted into some maladaptive coping strategies that influenced the adverse impact of CLBP in this community. Patient-centred management of CLBP in rural Nigeria should target unhelpful beliefs and practices while emphasizing behavioural modification such as exercise and functional activity modification. The usefulness of incorporating the identified positive aspects of spirituality should be explored in such interventions as evidence points to the centrality of spirituality in the cultural identity of Africans (390, 391, 464).

The next chapter (Study 2) will explore the factors involved in the management of CLBP in rural Nigeria, from the point of view of the health care practitioners treating the participants with CLBP in this study.
3 'Why should that pain linger for such a long time’? Practitioners’ beliefs and management of chronic low back pain in rural Nigeria

3.1 Chapter summary

This chapter presents the qualitative investigation of the beliefs and management strategies of practitioners and religious leaders (pastors) consulted by the participants with CLBP in Study one. A brief literature review provides the background to the study (section 3.2). This is followed by the methods used in the qualitative interviewing and analysis of data (section 3.3). The results of the study are presented next (section 3.4), and the implications of these are explored in the discussion (section 3.5).

Participants with CLBP consulted a wide range of practitioners including chemists, herbalists, doctors and physiotherapists. All consulted practitioners had predominant biomedical beliefs and management strategies. Physiotherapists had biomechanical explanations and management strategies. The doctor, nurse and herbalists primarily had infective, degenerative and traumatic understanding and management strategies. However, pastors had a biopsychosocial understanding of CLBP, and managed it mainly from a spiritual perspective. The practitioners’ and pastors’ beliefs and management strategies aligned with the beliefs held by the people living with CLBP in rural Nigeria, highlighting the biopsychosocial factors that may be associated with CLBP in rural Nigeria.
3.2 Introduction

3.2.1 Background

Patients’ CLBP beliefs is a crucial platform from which to develop a clinical intervention, as these beliefs affect pain perception, interpretation of pain, pain behaviour and treatment responses, all of which impact CLBP disability (456). The nature and function of these beliefs are influenced by the health practitioner-patient interaction (381, 436, 457, 465). As patients’ beliefs, pain-related behaviours, coping strategies and health outcomes may be shaped by interactions with practitioners (466), examining and targeting both patients’ and practitioners’ beliefs may be warranted to optimise treatment outcomes (456, 467). Practitioners’ beliefs and management of CLBP have not been explored in rural African contexts, only a few studies have been conducted in western developed countries.

A systematic review of western-based studies (UK, France, Netherlands, Australia, Germany, Norway, Sweden and the USA) found evidence that health professionals’ beliefs about CLBP and their management strategies influenced their patients’ beliefs (459). For instance, practitioners in the UK and Netherlands with biomedical beliefs about CLBP were more likely to prescribe bed rest and staying off work (468, 469), contradicting recommendations of evidence-based guidelines for the management of CLBP (9, 12). In another UK study, the overall sickness certification behaviour of General Practitioners (GPs) rather than their beliefs about LBP, directly influenced their issuing of sickness certification for LBP (470). However, the general sickness certification behaviour of the GPs may have been driven by specific beliefs.

Although UK Physiotherapists have a predominant mechanical understanding of CLBP, their attitude towards managing it by empowering patients to exercise and self-manage their pain and functional problems, rather than encouraging them to be passive recipients of ‘treatment’, may be valuable (436). However, conflicts occurred when a few patients insisted on being cured rather than self-manage their CLBP (436), underscoring the need for enhancing skills in psychosocial communication. UK GPs had a biopsychosocial orientation in CLBP management, acknowledging both biomechanical
and psychosocial factors (465). However, the doctors’ relationship with their patients was undermined when they could not challenge their patients’ physical explanatory models (465). This suggests the necessity of psychosocial communication strategies. GPs in Ireland acknowledged biomedical and psychosocial factors in CLBP management which appeared beneficial (471). However, the doctors’ distrust of the genuineness of their patients’ symptoms resulted in an autonomous rather than a collaborative approach to managing CLBP, hampering positive outcomes (471).

Although some physiotherapists and doctors in western developed countries acknowledged the importance of both biomedical and psychosocial factors in CLBP outcomes, psychosocial factors did not appear to be clearly targeted (436, 465, 471). A few UK GPs were still more likely to want laboratory tests, and the physiotherapists were still more likely to ask for X-rays or MRIs (468). Directly targeting psychosocial and biomedical factors has been shown to maintain positive CLBP outcomes in the long term (2 years). In contrast, an exclusively biomedical approach to managing CLBP improved outcomes only in the short term (3 weeks), which was completely lost in the longer term (6 months) (472).

In addition to practitioners’ beliefs and orientation in managing CLBP, their communication styles such as the different ways in which terms are used to describe CLBP may confuse and distress patients. For instance, the word ‘chronic’ increased emotional distress in UK patients with CLBP but this was reduced when it was replaced by the word ‘long-term’ (457). Challenges with language and CLBP management may be magnified in rural Nigeria where several alternative practitioners are involved in providing health care and may hold beliefs that are different from conventional practitioners (233, 234, 473). Therefore, investigating the beliefs and management of CLBP by practitioners treating people with CLBP in rural Nigeria may further enhance the understanding of the experience of people living with CLBP in rural Nigeria. Specifically, it could highlight practitioners’ beliefs and practices that require targeting in comprehensive community based interventions in rural Nigeria. This chapter acknowledges the items in the consolidated criteria for reporting qualitative research (COREQ) (411).
3.2.2 Aims of the research

To investigate the beliefs and management strategies of the individuals consulted by the participants with CLBP recruited in Study one.

3.3 Methods

3.3.1 Design

Qualitative semi-structured face-to-face individual interviews.

3.3.2 Ethical considerations

Ethical approvals were obtained from King’s College London (Ref: BDM/12/13-123) and University of Nigeria Teaching Hospital (Ref: UNTH/CSA/329/Vol.5) (Appendix 2).

3.3.3 Study setting

Interviews were conducted in the interviewees’ office facilities where they were consulted by the participants with CLBP (Study 1). These facilities were located in rural and urban communities in Enugu state, southeast Nigeria.

3.3.4 Participant recruitment

Medical/health and alternative practitioners (doctors, physiotherapists, chemists, herbalists), and religious leaders (pastors) were identified by the participants with CLBP recruited in Study one (snowball sampling). Participants in this study were at least eighteen years old, and had managed or given advice to at least one of the participants with CLBP. They were initially contacted through phone call or a visit to their facilities.
Written and oral explanations of the purpose of the study were provided (Appendix 9). Interested participants gave the researcher another appointment after informed consent (Appendix 10) was obtained. They were subsequently interviewed in their facilities.

### 3.3.5 Procedure

The interview guide explored participants’ beliefs about CLBP, their management strategies and perceived effectiveness of these strategies (Appendix 11). The guide was developed after a literature search and analysis of the interviews in Study one. Questions were firstly written in English and then translated into Igbo by back-translation, consultation, collaboration and piloting (426, 427). Interviews were conducted individually and face-to-face in English or Igbo by the bilingual researcher. Alternative practitioners (who do not routinely practise in mainstream health care in Nigeria) preferred to be interviewed in Igbo, while English was preferred by the mainstream practitioners and some pastors.

The average duration of each interview was thirty minutes (ranged between twenty to forty minutes). A reflective diary and field notes were used to record the researcher’s thoughts and experiences in the field during this study (Appendix 12).

### 3.3.6 Data management, analysis and trustworthiness

The framework approach (417, 419) was used for thematic analysis of data as in Study one. Interviews were transcribed verbatim in the language in which they were conducted. Igbo transcripts were forward translated to English by the bilingual researcher. One randomly selected translated interview transcript was back translated from English to Igbo by a bilingual British resident, and compared with the original Igbo transcript to ensure that meaning was not lost during translation. All English transcripts, reflective and field notes were entered into NVivo version 10, QSR international, Melbourne, Australia.
Transcripts were coded inductively to develop descriptive codes that were grounded in the data. The descriptive codes were used to organise the data which increased familiarisation and immersion in the data. Higher order analytical categories were then developed from the codes. The categories were used to develop initial thematic framework which was used to index the entire data. The final themes and narrative emerged from the abstraction and interpretation of the thematic framework.

A randomly selected Igbo transcript was coded by a Nigerian based researcher to validate the coding process. All analytical steps were validated by the research team to ensure that the emerging codes, categories, themes and narrative reflected the original data.

### 3.4 Results

#### 3.4.1 Participants

Twelve participants aged between 21 and 53 years were recruited, and interviewed for this study. Table 3.1 below shows the demographic characteristics of the participants. There were four mainstream healthcare practitioners including a female nurse, two male physiotherapists and one male orthopaedic resident doctor. The nurse practiced simultaneously as a conventional nurse and as a ‘chemist’ in a local pharmacy store in a rural community in Enugu state. ‘Chemists’ are unqualified pharmacists who dispense drugs in rural Nigeria. The physiotherapists and orthopaedic resident doctor were practicing in secondary or tertiary hospitals in Enugu city. The six alternative practitioners comprised two male ‘chemists’, one female ‘chemist’ and three female herbalists. Herbalists make, prescribe and dispense local herbal remedies. Two male pastors were also consulted about CLBP and so were included in this study. The chemists and pastors were living and working in rural communities in Enugu state, and the herbalists were consulted in the urban communities in Enugu.
Table 3.1: Socio-demographic characteristics of practitioners

<table>
<thead>
<tr>
<th>Gender</th>
<th>Age (years)</th>
<th>Completed education</th>
<th>Occupation</th>
<th>Practice context</th>
<th>Years of practice</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alternative practitioners</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>53</td>
<td>Primary</td>
<td>*Chemist</td>
<td>Rural</td>
<td>30</td>
</tr>
<tr>
<td>Male</td>
<td>37</td>
<td>Secondary</td>
<td>*Chemist</td>
<td>Rural</td>
<td>6</td>
</tr>
<tr>
<td>Female</td>
<td>45</td>
<td>Secondary</td>
<td>*Chemist</td>
<td>Rural</td>
<td>29</td>
</tr>
<tr>
<td>Female</td>
<td>26</td>
<td>Secondary</td>
<td>*Herbalist</td>
<td>Urban</td>
<td>10</td>
</tr>
<tr>
<td>Female</td>
<td>38</td>
<td>Secondary</td>
<td>*Herbalist</td>
<td>Urban</td>
<td>20</td>
</tr>
<tr>
<td>Female</td>
<td>21</td>
<td>Secondary</td>
<td>*Herbalist</td>
<td>Urban</td>
<td>5</td>
</tr>
<tr>
<td><strong>Religious leaders</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>53</td>
<td>Secondary</td>
<td>Pastor</td>
<td>Rural</td>
<td>13</td>
</tr>
<tr>
<td>Male</td>
<td>39</td>
<td>Tertiary/OND</td>
<td>Pastor</td>
<td>Rural</td>
<td>7</td>
</tr>
<tr>
<td><strong>Conventional practitioners</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>42</td>
<td>Basic nursing</td>
<td>Nurse (chemist*)</td>
<td>Rural</td>
<td>12</td>
</tr>
<tr>
<td>Male</td>
<td>34</td>
<td>Tertiary/MBBS</td>
<td>Orthopaedic resident</td>
<td>Urban</td>
<td>8</td>
</tr>
<tr>
<td>Male</td>
<td>44</td>
<td>Tertiary/MSc</td>
<td>Physiotherapist</td>
<td>Urban</td>
<td>15</td>
</tr>
<tr>
<td>Male</td>
<td>43</td>
<td>Tertiary/BPT</td>
<td>Physiotherapist</td>
<td>Urban</td>
<td>15</td>
</tr>
</tbody>
</table>

* unqualified pharmacists that dispense drugs; ° people that make and dispense herbal remedies

3.4.2 Analytical themes

Table 3.2 below illustrates the three themes and seven subthemes generated from the thematic analysis.
### Table 3.2: Analytical themes

<table>
<thead>
<tr>
<th>Themes</th>
<th>Varied explanatory models of back pain</th>
<th>Classification-based management of back pain</th>
<th>Dynamics of managing chronic low back pain in rural Nigeria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sub-themes</strong></td>
<td>Biomedical formulations of back pain</td>
<td>No distinction drawn between acute and chronic back pain</td>
<td>Perceived effectiveness of different management strategies for low back pain</td>
</tr>
<tr>
<td>Cultural explanations for persistent back pain</td>
<td>Persistent back pain often perceived as ‘spiritual’</td>
<td></td>
<td>Deterrents to conventional management of back pain</td>
</tr>
<tr>
<td>Spiritual understanding of non-specific persistent back pain</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


1. Varied explanatory models of back pain

Participants mostly had back pain related beliefs that were either: predominantly biomedical or spiritual within a biopsychosocial understanding.

Biomedical formulations of back pain

Genetic, infective, degenerative or biomechanical factors were believed to cause and maintain back pain. Different biomedical explanations of back pain were given with no distinctions between acute and chronic LBP. The doctor’s understanding was predominantly infective-traumatic-degenerative. The physiotherapists had a biomechanical understanding of back pain. The nurse who also practised as a chemist, had a degenerative-infective understanding of LBP. The chemists offered a combination of biomedical, genetic or traumatic explanations of back pain.

‘...wide range of causes...infective, traumatic, to osteodegenerative diseases...' (Orthopaedic resident doctor).

‘...Wrong posture, bad lifting techniques, bad ergonomics, sitting posture, lying posture, our day to day living...' (Physiotherapist 1).

‘...because of old age, arthritis...rheumatism...bad water and bad blood cause rheumatism...the way you get bad blood is...infection...if it is not treated well...' (Nurse- 'chemist').

‘...the jobs they do...farming up to 4 hours...bent down...' (Chemist 3) ‘...back pain is inherited from their family...' (Chemist 1) or due to accident...' (Chemist 2).

When back pain could not be linked to old age or a specific biomechanical event, infection became the salient explanation offered by the herbalists. Herbalists associated LBP perceived to be due to infection related to symptoms of ‘hotness’ and unexplained moving sensations in the body.

‘...somebody just started having back pain...we discover that what causes it is infection...the person says that the waist (lower back) feels hot’ (Herbalist 2).

‘...the one (back pain) due to infection is that s/he (patient) would tell you that something is moving about their body...' (Herbalist 3).

The pastors also had a biomedical understanding of back pain, reflected in their explanation of LBP as a disease resulting from hard labour and over working, child bearing and rearing, and poor nutrition.
‘...when someone is not eating balanced diet, the person’s blood is never complete...it is that blood that forms the body tissue and tendons...causes pain’ (Pastor 1).

The doctor understood non-specific back pain in terms of lack of diagnostic equipment for back pain such as MRI and CT scans in Nigeria.

‘...we see the non-specific back pain as those we have limitations to identify...’ (Orthopaedic resident doctor).

Cultural explanations for persistent back pain
Cultural connotations of back pain portrayed Igbo people as being more prone to persistent pain. The doctor believed that there were cultural differences in pain tolerance, and that Southern Nigerians had a lower pain tolerance than Northern Nigerians. The pastors believed that Igbo people have inordinately high ambitions that drove behaviour that maintained chronic pain.

‘...people from the southern part of the country feel pain with the slightest disturbance...’ (Orthopaedic resident doctor).

‘...a real Igbo man does not believe in rest...myself inclusive...sometimes pain is due to restlessness...lack of rest...’ (Pastor 1).

Spiritual understanding of non-specific persistent back pain
Back pain became perceived in this context as spiritual when it is persistent without any clear underlying cause. This type of persistent back pain was often linked to a specific event such as someone casting a spiritual spell on another person, or blood deficiency due to spiritual forces. The transient nature of back pain also reinforced a spiritual causal understanding.

‘...you see that something is wrong but you are not sure what it is...Why should that pain linger for such a long time? That’s why we suspected that it (back pain) was spiritual...’ (Pastor 2).

2. Classification-based management of back pain
All participants managed LBP according to different sub-groups that appeared profession-specific. The mainstream health professionals: the doctor, physiotherapists
and nurse, had subgroups defined within the biomedical model. All alternative practitioners also defined subgroups located within a biomedical model. Pastors adopted a biopsychosocial-spiritual model of managing LBP.

**No distinction drawn between acute and chronic back pain**

The doctor, chemists and herbalists adopted a predominantly drug-driven biomedical model, while the physiotherapists adopted a biomechanically-driven biomedical model of managing low back pain. Duration of back pain did not influence management options as there was no differentiation in the management of acute and chronic LBP. The doctor’s account reflected a diagnosis-treatment-cure basis for LBP management. He reported referring patients for physiotherapy when there were no apparent positive results on blood or radiological investigations, or when x-rays revealed degenerative changes.

‘...After investigating the patient with radiological and blood work up, we are able to arrive at a diagnosis...they benefit from either distraction...skin traction, bed rest...but for some, we request that they go for Physio...' (Orthopaedic resident doctor).

Chemists utilised analgesic drugs in managing back pain, whereas the herbalists prescribed herbs for controlling infection and pain. These drugs were prescribed on a continual basis.

‘...we give them herbs for pain, or herbs for infection if the pain is due to infection...’ (Herbalist 1).

‘...you might give the person a few analgesics like diclofenac...he might take it like 3 doses and feel better, and then decide that you continue giving him the drugs...’ (Chemist 2).

However, the ‘chemists’ and herbalists claimed they advised patients to visit mainstream health care facilities for further investigations such as x-rays to diagnose their CLBP when pain became persistent. However, this response might have been influenced by who they perceived the researcher to be – a mainstream health care professional (Reflective diary, 15/9/2013).

The different classifications of LBP were not based on the duration of pain but on the perceived underlying biomedical mechanisms driving pain.
‘...Back pain is of different types...we give them herbs depending on the type...’ (Herbalist 2).

‘we classify treatment based on presentation...various subgroups...manipulative group, exercise group, stabilisation group, traction group...’ (Physiotherapist 1).

‘...well...pain duration doesn’t determine treatment... ...’ (Physiotherapist 2)

Although physiotherapists did not consider psychosocial factors in the assessment and management of CLBP, they included home programmes for their patients. The programmes were predominantly biomechanical and appeared to be given only as an adjunct to Physiotherapy rather than as lifelong behaviour change requirement. They also emphasized and assessed adherence to home exercises, albeit informally. Physiotherapists reported that explaining the content and the effects of the home exercises improved patients’ acceptance and adherence.

‘...when they come, we ask them. ‘what about the assignment’? some of them after teaching them, they don’t do it well...so you might need to teach them again...’ (Physiotherapist 2).

‘...if you tell the patient the reason for the home programmes, you have taken away one barrier...if you tell the patient what to do, and why you want him to do it, he will be doing it...’ (Physiotherapist 2).

**Persistent back pain often perceived as ‘spiritual’**

The pastors were the only ones that acknowledged a biopsychosocial model of CLBP when advising and supporting their patients. This appeared to be driven by their biopsychosocial-spiritual concept of health. They believed that humans are made up of three entities namely: soul, spirit and body. Therefore, they perceived that spirituality was a way of achieving a complete state of health in patients with back pain.

‘...when I pray for them (patients), what I intend to achieve is for them to be healthy, soul, spirit and body’ (Pastor 1).

The pastors’ distinction in managing acute and chronic LBP appeared to be an increased emphasis on the spiritual aspect of persistent back pain. They believed that spiritual factors were the underlying mechanisms driving chronicity. LBP perceived as ‘non-specific’ by pastors was also predominantly addressed spiritually. When pain persisted despite repeated prayers, pastors blamed patients for lacking trust and faith that hindered their healing.
‘...healings have all been through faith...but there are those who don’t believe...’ (Pastor 2).

Biomedical and psychosocial factors were addressed by the pastors after praying, in a bid to achieve a complete state of health. One pastor tried to help patients using this biopsychosocial-spiritual model aimed at reducing emotional distress and internalising locus of control. He believed that addressing relevant psychosocial factors improved the effectiveness of the spiritual interventions and enabled patients to take better control of their health. The pastors believed that encouraging patients to identify with the good attributes of rural habitation facilitated acceptance, and reduced the negative impact of the perceptions of the Nigerian rural-urban divide.

‘...Then after praying...I begin to counsel them (patients)...what do you eat, how do you rest...how many hours do you sleep a day? tell them the importance of living in a good environment...’ (Pastor 1)

‘...the person goes to urinate several times in the night because of too much thinking...the person has anxiety...some people will tell you things are hard. Government this and that. Not true...people believe that unless you have big money...you can’t be happy...it’s not true. We live in the village...we have the best environment depending on how we keep it ...’ (Pastor 1).

3. **Dynamics of managing chronic low back pain in rural Nigeria**

Most practitioners believed their management strategies for LBP were effective. However, the mainstream health practitioners (the doctor and Physiotherapists), reported constraints around the conventional management of LBP for rural dwellers in Nigeria. These restrictions were not conveyed by any of the alternative practitioners or Pastors.

**Perceived effectiveness of different management strategies for low back pain**

Chemists believed their management of acute LBP was effective, however they did not perceive themselves competent in autonomously managing chronic LBP. They believed their competence in managing acute LBP was related to the fact that their treatment mirrored the doctor’s as they prescribed the same drugs as doctors. This perception of competence might be linked to their management of mainly acute infective conditions. They viewed themselves mainly as first aid providers.
‘...you know that what we do is first aid. It’s not that I must cure the person with the pain that has been there a long time...' (Chemist 2).

The herbalists also viewed their treatment of LBP as effective. Their perceived competence was reinforced by the fact that their management strategies were thought to have stood the test of time because they had been passed down over several decades and generations.

‘...most of these treatments were inherited from our parents and forefathers...' (Herbalist 2).

Physiotherapists perceived their treatments to be effective and reported that many patients recovered. However, they did not expect a complete recovery of symptoms. The doctor was not so optimistic.

‘...60% recovery is okay...They (patients) all got better...' (Physiotherapist 1).

The doctor reported that the duration of LBP and the patients’ age influenced clinical outcomes, although these were not targeted in their management. Treatment was perceived to be more effective for acute LBP and younger patients than for CLBP and older patients.

‘...I think the acute ones...and mostly the younger ones...those younger than 45 years...do get well...' (Orthopaedic resident doctor).

Deterrents to conventional management of back pain

Only the mainstream health practitioners namely the doctor and physiotherapists reported impediments in their management of LBP. The doctor mentioned poor diagnostic tools as barriers to effective management of LBP. Another constraint that he mentioned was the loss of patients to follow up.

‘...limitations in terms of our facilities...in terms of tests like MRI, contrast CTs...in our environment we often lose our patients to follow up...' (Orthopaedic resident doctor).

The doctor reported that the younger patients did not adhere to treatment. The younger patients were more likely to be active and preferred active self-management. They therefore did not comply with the doctor’s prescription of bed rest for managing their back pain. In contrast, the older patients were not encouraged to have bed rest and appeared to be more compliant with treatment.
‘...I gave her bed rest for 3 weeks. But she resisted the admission and decided to go home...’ (Orthopaedic resident doctor).

‘...for the elderly, we limit the option of bed rest for them...because they are prone to osteoporosis...immobilisation, orthostatic pneumonia, pressure sores, muscle wasting because of disuse...’ (Orthopaedic resident doctor).

Self-management seemed more attractive to the poorer patients, many of whom were rural dwellers. They were believed to seek alternative means for managing their back pain which was cheaper and more accessible than mainstream health care, at least in the short term. However, alternative health care is believed to become more expensive in the long term.

‘...in our environment, because of the high poverty rate, patients’ first point of call is self-management. When the thing (pain) gets out of hand, that is when they seek us...but unorthodox medicine becomes more expensive over time...’ (Orthopaedic resident doctor).

The physiotherapists also reported curbs to their management of LBP, such as the lack of awareness of Physiotherapy in rural Nigeria. Distance, time and cost were cited as other reasons for the reduced access of rural patients to physiotherapy services. The cost of physiotherapy was reported to be affordable, however the cost of transportation required for repeated visits was believed to hinder rural patients’ access to physiotherapy.

‘...rural patients don’t come...because they don’t know about this (Physiotherapy)...’ (Physiotherapist 1).

‘...the treatment here (Physiotherapy department) is not very expensive, but the thing is distance. Distance and time...the time it takes them...in some cases, you may need to come for months...’ (Physiotherapist 2).

The physiotherapists reported that their rural patients relied on self-tailored self-management strategies such as hot water and massage. They highlighted the need for community based rehabilitation services in rural Nigeria which was also supported by the Pastors.
3.5 Discussion

3.5.1 Summary and interpretation of findings

All participants except the pastors adopted the biomedical model for managing back pain that did not distinguish between acute and chronic LBP. The biopsychosocial model was adopted by the pastors, from a predominantly spiritual perspective, and provided a distinction between the management of acute and persistent LBP. It is important for practitioners to distinguish the management strategies for acute and chronic LBP as evidence suggests that pain severity may be more important in the acute phase of LBP, whereas disability and mood may be more important in the chronic phase of LBP (456).

Physiotherapists’ training in Nigeria conceptualises the human body as biomechanical, whereas increasing evidence suggests that biological processes driven by both biomedical and psychosocial factors underlie CLBP (223, 455, 456). Similar to the Nigerian physiotherapists, some UK physiotherapists understood CLBP to have an underlying mechanical and recurring nature (436, 468). The Nigerian physiotherapists did not assess or target maladaptive LBP beliefs held by people living with CLBP in rural Nigeria (376). In contrast, there was a greater acknowledgement of psychosocial issues including beliefs in the management of CLBP by some UK physiotherapists and GPs (467). Back pain beliefs have been found to be important correlates of CLBP disability in western developed countries (68, 466).

Patient self-management was emphasized by the Nigerian physiotherapists, similar to physiotherapists in the UK (436). The physiotherapists’ encouragement of home programmes, their targeting and assessment of adherence by explaining to patients the reasons for home exercises may be useful. Evidence suggests that patients need to understand the reasons for prescribed treatment, mechanisms or causes of their CLBP, how prescribed treatment work and the evidence regarding effectiveness (263, 466). However, the Nigerian physiotherapists’ biomechanical orientation in their prescription of self-management as an adjunct to physiotherapy, as opposed to a lifelong behaviour change, may foster physiotherapist dependency, found to hamper home exercise adherence in Nigerian patients (474). Biomedical management of CLBP improves
outcomes only in the short term (472), suggesting that patients may require ongoing physiotherapy. As this may not be feasible for rural Nigerian patients due to cost and distance, they may be lost to the rural-based alternative health care and religious leaders. In contrast, the biopsychosocial model of CLBP may require less visits to the health care provider due to the central role of self-management (251, 468).

The Nigerian doctor’s biomedical model of CLBP appeared to be more salient than that of doctors in the UK (465, 467), and may be linked to the predominant acute infective health care model in Africa (453). The Nigerian doctor’s diagnosis-treatment-cure model for managing CLBP and prescription of bed rest, contradicts recommendations of evidence-based guidelines, and may facilitate patients’ continual search for cure, reinforce passivity and externalise locus of control (468). If cure is not achieved, patients’ trust will most likely reduce, damaging patient-practitioner relationship (407, 456, 465).

The doctor’s reliance on radiological diagnosis of CLBP contradicts the literature which does not support using radiological findings for case definition of CLBP (65). Only a third of UK doctors and physiotherapists had such biomechanical orientation that emphasized the radiological diagnosis of CLBP (468). Many UK doctors utilised psychosocial information for making decisions about issuing fit notes, whereas some UK physiotherapists integrated psychosocial issues into clinical assessment, and as a path for addressing work related problems (467).

Therefore, Nigerian health professionals, especially doctors and physiotherapists need to acknowledge the biopsychosocial model in managing CLBP. They must not assume that patients will seek their services due to their expertise as evidence suggests that patients’ choice of practitioners is not based on practitioners’ formal qualifications, but by patients’ treatment experience, relationship with practitioners, and the proximity of practitioners (458).

The prolonged prescription of analgesic drugs by the chemists and herbalists may foster patients’ drug dependence, with potential adverse consequences (475). Alternative practitioners believed that the symptom described by their patients as ‘something moving about the body’ was due to infection. However, this symptom has been associated with psychological distress and somatisation in West African contexts, where the body is used as the basis for expressing emotional terms (124). The herbalists associated the symptom described as ‘hotness in the back’ to infection linked to fertility
problems, which might facilitate maladaptive LBP beliefs, and increase patients’ emotional distress (404).

The pastors’ biopsychosocial-spiritual model of CLBP better reflects the WHO’s definition of health as “a complete state of physical, mental and social well-being, and not merely the absence of disease or infirmity” (476). Pastors addressed patient beliefs, attitude and behaviour, and encouraged patients to take charge of their environment and health. However, some pastors blamed patients for their failure to heal which might exacerbate patient’s anxiety and depression. Moreover, a spiritual understanding of CLBP may foster maladaptive LBP beliefs and reinforce a continual search for healing.

The doctor’s anecdotal reports implying that southern Nigerians may have lower pain tolerance than northern Nigerians does not appear to be supported by the literature. For instance, cross-sectional studies of labour pain perception and utilisation of obstetric analgesia in Nigeria suggested no differences in pain perception among south eastern, south western and northern Nigerians (477-479). A prospective study also supports the lack of evidence for ethnic differences in pain perception in Nigeria (480). However, the extent to which labour pain results can be translated to chronic LBP is uncertain.

This study suggests that the beliefs and management strategies of the consulted practitioners aligned with the beliefs of people living with CLBP in rural Nigeria (376). This supports previous evidence (385, 459). Targeting practitioners’ beliefs and practices, found to reduce maladaptive CLBP beliefs (481), therefore seems a logical aspect of patient management (361, 456).

### 3.5.2 Strengths and limitations

The strength of this research is that it is completely novel as it is the first study to explore the beliefs and management strategies of practitioners and religious leaders consulted by people living with CLBP in rural Nigeria. Other strengths include the rigorous systematic data collection and analysis, detailed description of the methods, reflexivity and respondent validation, as well as the findings being validated by a multidisciplinary team. The involvement of practitioners consulted by people living with CLBP enabled
an exploration of the extent to which the impact of CLBP in rural Nigeria may be attributed to practitioners’ beliefs and management strategies. As this is a qualitative research, the results of this study are context-specific. Moreover, some practitioners that manage CLBP in rural Nigeria may not have been identified.

3.6 Conclusions

This is the first qualitative study of practitioners consulted for the management of CLBP in rural Nigeria. Findings suggest that practitioners’ unhelpful beliefs and management strategies may likely contribute to the adverse impact of CLBP in rural Nigeria. Educating both mainstream and alternative practitioners as a facet of comprehensive community based management strategies for people living with CLBP in rural Nigeria may be required.

The next chapter (Study 3) will detail the identification, cross-cultural adaptation and psychometric testing of measures for assessing the identified biopsychosocial factors.
4 Cross-cultural adaptation and psychometric testing of Igbo self-report outcome measures

4.1 Chapter summary

This chapter describes how the Roland Morris Disability Questionnaire (RMDQ), World Health Organisation Disability Assessment Schedule (WHODAS 2.0), eleven-point box scale (BS-11), Hospital Anxiety and Depression Scale (HADS), Coping Strategies Questionnaire (CSQ), Multidimensional Scale of Perceived Social Support (MSPSS), Occupational Risk Factor Questionnaire (ORFQ), Brief Illness Perception Questionnaire (BIPQ) and Fear Avoidance Beliefs Questionnaire (FABQ) were cross-culturally adapted into Igbo. These measures were then piloted with Igbo-speaking people with chronic low back pain (CLBP) to assess comprehensibility and acceptability. Validity and reliability testing were then undertaken to determine the psychometric properties of the questionnaires (section 4.3).

The face and content validity of the Igbo measures was ensured through rigorous cross-cultural adaptation that involved a panel of experts. The results showed that these measures were comprehensible and acceptable among people with CLBP in rural Nigeria. All measures demonstrated adequate psychometric properties, comparable with the original measures and other adaptations (section 4.4). Their employment and further validation in other Igbo speaking populations is recommended (sections 4.5 and 4.6).
4.2 Introduction

4.2.1 Rationale

Self-report measures are the most commonly used outcome measures in CLBP research due to low cost (482) and ease of administration (483), including minimal patient burden, flexible timing/method of administration, practicality and non-invasiveness (483-486). Moreover, self-report assessment may be comparable to objective measurements (487), and is sometimes more reliable than objective assessments such as measurement of passive vertebral movement or identification of radiographic abnormalities (40). Therefore, the use of self-report measures in rehabilitation research is popular (488).

The common criticisms of using self-report measures in research include the increased likelihood of self-presentation or recall bias (40, 489-491). However, pain and some psychosocial factors associated with CLBP disability including illness perceptions and disability constructs such as participation restriction, may be more directly measured subjectively through self-reports.

Self-report measures for LBP research were mostly developed in English speaking Western countries (52, 149, 197, 492-500). Consequently, they may be difficult to use in clinical and epidemiological studies in non-English or non-Western settings with different languages and cultures, where similar concepts may have different meanings (501, 502).

Guidelines, developed from reviewing the cross-cultural adaptation of medical, sociological and psychological literature, justifies the use of self-report measures in countries, cultures and/or languages that differ from those where they were initially developed (503-506). This requires unique methods of translation and cultural adaptation to ensure semantic, idiomatic, experiential, and conceptual equivalence between the source and target questionnaires (503, 504). The source questionnaire refers to the original measure, while the target questionnaire refers to the new questionnaire after it has been adapted into the new language/culture (503, 504).
Translation involves linguistic paraphrasing of the questionnaire. In contrast, cross-cultural adaptation comprises both translation and cultural adaptation in order to maintain the content validity of the instrument at a similar conceptual level in a different context. This involves adaptation of individual items, instructions for the questionnaire, and the response options. Cross-cultural adaptation involves (i) cultural adaptation only, in cases of established immigrants in the source country or use in another country of the same language; or (ii) translation and cultural adaptation, for new immigrants in the source country or in another country with another language (503). Cross-cultural adaptation does not ensure retention of psychometric properties, therefore psychometric testing in terms of validity and reliability, at an item and/or scale level, is recommended after cross-cultural adaptation (503).

Important factors implicated in the experience of CLBP in rural Nigeria according to the studies in Chapters two and three (Studies 1 and 2) were disability, pain intensity, catastrophizing, pain coping strategies, anxiety and depression, social support, illness perceptions, fear avoidance beliefs and occupational biomechanical factors. Of all these factors, only pain intensity had an adapted and validated Igbo measure – the visual analogue scale (VAS) (507). However, as suggested in the results from the study in Chapter two (Study 1), people in this population may have difficulties comprehending the VAS due to low literacy rates, as suggested in previous research (492).

The paucity of adapted chronic pain measures may be due to limited chronic pain research in Africa (502), and the fact that most research in Nigeria has involved urban English speaking participants, precluding the illiterate rural dwellers with the worst health outcomes (26, 67, 236, 238, 508-510). One reason for excluding illiterate rural Nigerians from research could be the need to adapt self-report measures into interviewer-administered measures which is more labour intensive and complex (511). However, previous studies suggest that interviewer-administration of self-report measures is valid when interviewers are adequately trained to minimise bias to patient responses (512, 513). Moreover, interviewer-administration has been shown to reduce missing data (513), and may be the only way to administer self-report measures to illiterate people in low resource settings (514-516).
4.2.2 Aims of the research

1. Cross-culturally adapt the RMDQ, WHODAS 2.0, BS-11, HADS, CSQ, MSPSS, ORFQ, BIPQ and FABQ.
2. Investigate the psychometric (validity and reliability) properties of Igbo-RMDQ, Igbo-WHODAS 2.0, Igbo-BS-11, Igbo-HADS, Igbo-CSQ, Igbo-MSPSS, Igbo-ORFQ, Igbo-BIPQ and Igbo-FABQ.

4.3 Methods

4.3.1 Ethical considerations

Ethical approvals were obtained from King’s College London (Ref: BDM/13/14-99) and University of Nigeria Teaching Hospital (Ref: UNTH/CSA/329/Vol.5) (Appendix 13). Written permission was obtained from the original developers of the measures (Appendix 14).

4.3.2 Study designs

Cross-cultural adaptation, test-retest measurements and cross-sectional study of psychometric properties.

4.3.3 Self-report outcome measures

It was necessary to include a large number of measures (implicated in Studies 1 and 2), due to limited previous research on the biopsychosocial factors associated with CLBP disability in rural Nigeria. To alleviate participant burden, respondents were allowed break periods during interviewer-administration of the measures.
Roland Morris Disability Questionnaire (RMDQ)

Disability was implied in the inability of people with CLBP to fulfill their male and female gender roles in rural Nigeria, in the study in Chapter two (Study 1). RMDQ was chosen because it is the most commonly used valid measure of LBP disability (493). It is recommended as a core outcome measure for the standardisation of outcome measurement in LBP clinical trials, meta-analyses, cost-effectiveness analyses and multicenter studies (517). RMDQ is simple to administer, easily understood, and is the best measure for population or primary care based studies (517, 518).

RMDQ is a twenty-four item back specific self-report measure with each item having possible scores of 0 or 1 (496). A total maximum score of 24 signifies the highest possible disability level and 0 means that there is no disability. It has good face and content validity, construct validity, internal consistency, test-retest reliability and responsiveness (518). It has Cronbach’s alpha ranging between 0.84 and 0.93; test-retest reliability ranging between 0.72 and 0.91; and a 2-3-point change from baseline is considered clinically important (518). RMDQ conceptualises disability at the three levels of the ICF: body structures and function, activities and participation, and environmental factors. Similar to other LBP-specific disability measures, it places less emphasis on participation, and does not capture work-related outcomes (42).

World Health Organisation Disability Assessment Schedule (WHODAS 2.0)

The WHODAS 2.0 was chosen because it is a comprehensive measure of disability, with an interviewer-administered version available, that measures disability within the ICF biopsychosocial model (49). It emphasizes all six domains of disability: cognition, mobility, self-care, getting along with people, life activities and participation, and includes work-related disability (52). Moreover, Nigeria was one of the 21 countries that contributed data for its development, ensuring cultural sensitivity of the measure in Nigeria (52). As the measure is generic and comprehensive, it would enable comparisons across populations, conditions and an understanding of the disability domains affected. WHODAS 2.0 has good face and content validity, construct validity, internal consistency, test-retest reliability and responsiveness. The Cronbach’s alpha ranges between 0.94 and 0.98; test-retest reliability ranges between 0.93 and 0.98; and sensitivity to change ranges between 0.46 and 1.38 (52).
The 36-item interviewer-administered version, which has a simple and complex scoring methods was used due to the low literacy levels in this population. Simple scoring involves assigning values “none” =1, “mild” =2 “moderate” =3, “severe” =4 and “extreme” =5, which are simply added up without weighting of individual items. As the simple scoring method may not be comparable across populations and conditions (52), the complex scoring method was used in this thesis. Complex scoring is an “item-response-theory” (IRT) based scoring that takes into consideration multiple levels of difficulty for each WHODAS 2.0 item. It involves: summing recoded item scores in each domain, summing all six domain scores, and converting the summary score into a metric ranging from 0 (no disability) to 100 (full disability) (52).

Eleven-point box scale (BS-11)
As suggested in the studies in Chapters two and three (Studies 1 and 2), LBP is a painful condition, therefore it was necessary to measure pain intensity. Moreover, pain intensity has been shown to be a predictor of CLBP disability (135). BS-11 is a single eleven-point numeric scale for pain intensity (492, 519). It consists of eleven numbers (0 through 10) surrounded by boxes (520). Zero represents ‘no pain’ and 10 represents ‘pain as bad as you can imagine’ or ‘worst pain imaginable’ (492, 521, 522). It was chosen for this thesis due to its easy comprehensibility and ease of administration (492). It is probably the measure of choice for population-based studies involving illiterate people in rural Nigeria. Moreover, it has already been shown that simple VAS was not easily understood in rural Nigeria (Study 1).

Hospital Anxiety and Depression Scale (HADS)
Anxiety and depression were implicated in the study in Chapter two in the subtheme ‘a life of living death’, which explained participants’ unbroken misery and hopelessness due to CLBP; and in the coping strategy ‘escaping from the self’ which appeared to be stimulated by feelings of extreme distress (Study 1). Psychological distress was also implicated in Chapter three, in the practitioners’ accounts of their patients reporting ‘something moving about the body’ (Study 2). In the literature, anxiety and depression have been found to play a key role in the development and maintenance of CLBP (79, 153, 284, 523).
The HADS was chosen because it differentiates anxiety and depression symptoms from somatic symptoms of physical illness, making it one of the best measures for assessing emotional state (524). It performs well in assessing the symptom severity and caseness of anxiety disorders and depression in somatic, psychiatric and primary care patients, and in the general population (524). It is commonly used in CLBP research both in developed countries (140, 157, 164, 256), and Nigeria (70).

The HADS has two subscales for anxiety (HADS-A) and depression (HADS-D), with seven items each. Each item has scores ranging from 0 to 3. A total subscale score of 0 on either anxiety or depression subscales means there is no anxiety or depression, and 21 is the maximum possible score meaning the most severe anxiety or depression (497). Summing the scores of anxiety and depression reflects a score of emotional distress with 0 meaning no distress, and 42 meaning highest possible level of emotional distress (497). Cut-off scores are: 0 to 7 non-cases, 8 to 10 borderline/mild cases, 11 to 21 definite/severe cases, with a score of 11 or more indicating “potential psychiatric caseness” (497). The original measure reported internal consistency of 0.41-0.76 for anxiety, and 0.30-0.60 for depression (497). Changes of 1.32-1.68 have been reported as clinically important (525).

**Coping Strategies Questionnaire (CSQ)**

Different coping strategies such as drug taking, searching for cure and activity pacing were a few of the strategies highlighted in the studies in Chapters two and three (Studies 1 and 2). This warrants an investigation of the influence of coping strategies on CLBP disability.

CSQ was chosen because it is valid and reliable (197, 526), and is the most widely used self-report measure of pain coping strategies (527). CSQ was developed to assess cognitive and behavioural coping strategies for dealing with pain (197). The 42-item version obtained by the removal of the eighth subscale ‘increasing pain behaviours’, with low internal consistency (197), was used. It consists of seven subscales (diverting attention, reinterpreting pain sensation, catastrophising, ignoring sensations, praying or hoping, coping self-statements and increased behavioural activities). Each subscale has six items. Each item has a numeric rating scale ranging from 0 (never do that) to 6
(always do that). Hence each subscale has a maximum score of 36 and a minimum score of 0. A higher score indicates greater use of a particular coping strategy. Additional two items assess overall effectiveness of pain control and ability to decrease pain (197). The internal consistencies of the subscales range between 0.71 and 0.85 (197).

**Multidimensional Scale of Perceived Social Support (MSPSS)**

The results from the studies in Chapters two and three (Studies 1 and 2) suggested that social support was used as a coping strategy by many of the participants with CLBP. It was therefore important to investigate if social support was associated with CLBP disability. MSPSS was chosen because of its validity, reliability, utility in terms of brevity, inclusion of social support from the significant other (498, 528, 529), and applicability in Africa (530).

MSPSS is a self-report measure of subjectively assessed social support (498). The scale has twelve items which can be summed as one total score, or as three subscales (family, friends or significant other) of four items each, depending on the source of social support. Each item has a 7-point Likert scale with values ranging from 1 (strongly disagree) to 7 (strongly agree). The minimum score for each subscale is 4 and 28 is the maximum score. For a total scoring, 12 is the minimum score, and 84 is the maximum score. A greater score indicates more perceived social support (498). The original scale reported an internal consistency of 0.88, and test-retest reliability of 0.85 (498, 529).

**Brief Illness Perception Questionnaire (BIPQ)**

In the study in Chapter two (Study 1), beliefs such as perceiving CLBP as an illness, or to be due to spiritual causes, appeared to influence emotional responses to CLBP, as well as the coping strategies adopted for its management. Therefore, the quantitative measurement of illness perceptions would enable the investigation of the influence of illness perceptions on CLBP disability. The literature suggests that illness cognitions influence CLBP disability (164, 173).

BIPQ was selected because it is a valid and reliable measure of illness perceptions, measures cognitive and emotional representations, and is the shortest of the illness perception questionnaires (499, 531, 532). This suggests its potential usefulness for
population-based studies incorporating several other measures in rural Nigeria. Moreover, the BIPQ has been found useful in chronic musculoskeletal pain (533, 534), and LBP research (177, 330).

BIPQ is a nine item self-report measure of illness perceptions (499). Each item, measured on a Likert scale ranging from 0 to 10, assesses one dimension of illness perceptions. Eight items (consequences, timeline, personal control, treatment control, identity, illness concern, coherence and emotional representation) (499), comprising cognitive and emotional illness perceptions (535), may be combined as one total score, or each item may be assessed separately to give eight dimensions of illness perceptions (499). The total BIPQ score is 80 and the minimum total score is 0 with a higher score reflecting a more threatening view of an illness (499). The total score requires that items 3, 4, and 7 are reverse scored and then added to items 1, 2, 5, 6, and 8. Each item is measured on an incremental five-point scale, anchored at “strongly disagree” and “strongly agree”. The ninth item is the causal item which is open, and can be analysed by grouping participants’ responses into relevant categories depending on the research question (499). Total scoring was shown to have better validity and reliability than scoring at the item level in a cross-sectional study of patients with sub-acute and chronic LBP (535). However, pooled evidence in a systematic review of 188 studies of diverse health conditions (170) demonstrated good concurrent, predictive and discriminant validity, as well as sensitivity to change at both the item and scale level. However, this review did not assess test-retest reliability, and the coherence item predicted the fewest outcomes (least predictive validity). Item-level test-retest reliability of the original measure ranged between 0.42-0.75 (499).

**Fear Avoidance Beliefs Questionnaire (FABQ)**

The participants’ understanding of CLBP as a disease of hard labour in the study in Chapter two (Study 1) suggests that fear avoidance beliefs may be important. Moreover, fear-avoidance beliefs have been found to predict poor outcome in CLBP in other settings (68, 69, 147, 153, 284, 523).

FABQ is one of the best measures for assessing fear avoidance beliefs (536). It is a sixteen item back pain-specific self-report measure that assesses the extent to which pain is
believed to be caused or aggravated by general physical activity (FABQ-PA) and work-related activities (FABQ-W). These represent the two subscales of the measure (149). FABQ-PA has five items, each scored with a Likert scale ranging from 0 (completely disagree) to 6 (completely agree). One item (1) is a distractor and is not scored. The maximum score for FABQ-PA is 24 and the minimum is 0, with higher scores indicating stronger fear avoidance beliefs related to physical activity. FABQ-W has 11 items, each having a Likert scale ranging from 0 (completely disagree) to 6 (completely agree), but four items (8, 13, 14, 16) are distractors, and do not contribute to total score. The maximum score for FABQ-W is 42 and minimum score is 0, with higher scores indicating stronger fear avoidance beliefs related to work activities. Summing the two subscale scores gives a total FABQ score of 64, with higher scores reflecting stronger fear avoidance beliefs (149). FABQ correlates significantly with other measures of fear-avoidance such as the Tampa Scale of Kinesiophobia; r=0.33-0.59 (537, 538). The internal consistency of FABQ range between 0.77 and 0.88 (149). A change of 13 from baseline is reported to be clinically important (539).

**Occupational Risk Factor Questionnaire (ORFQ)**

The participants’ reports in the study in Chapter two (Study 1), that occupational activities such as heavy lifting and prolonged bending aggravated their CLBP, implicated occupational biomechanical factors.

Measures of occupational biomechanical exposure are very limited (76, 83). The ORFQ is a 25-item self-report questionnaire of occupational biomechanical factors (500). The first five items (1-5) measure work organisational factors such as work pressure and stress. The other items (6-25) assess exposure to biomechanical factors such as bending, twisting, lifting, pulling, pushing, forceful movements and static postures like prolonged sitting, awkward postures and whole body vibrations. There is a first introductory question ‘please describe the main tasks of your job’ which is open, not numbered, and is not one of the 25 items in the questionnaire (500).

Items in the measure were designed by the developers to be analysed independently. However, to enable statistical analyses in this thesis, the measure was adapted such that a total score of the items could be obtained for biomechanical factors (items 6-25).
Although this total scoring method has not been validated, each item was scored based on the biomechanical thresholds reported to predict disabling LBP in South Africa (540, 541). A score of one was given to an item when the duration of exposure to the biomechanical factor was half the time or more, or when the frequency of exposure to the biomechanical factor was 11-30 times or more. An item was scored zero when exposure was less (540, 541). This scoring method assumed that the thresholds of biomechanical exposure which predicted disabling LBP, would be associated with adverse outcomes in CLBP. Evidence suggests that extreme biomechanical exposures may be associated with worse CLBP outcomes (65, 141), whereas moderate exposures may be protective (76). Possible scores ranged between 20 (maximum) and 0 (minimum) with greater scores reflecting higher exposure to biomechanical factors.

**Back performance scale (BPS)**

BPS is a back-specific performance based measure of mobility-related limitation that is scored by an assessor (542). The BPS is a more objective disability measure selected for the validity assessment of the self-report disability measures. Moreover, the predictors of self-reported and performance based disability may be different (543, 544).

The measure has simple instructions and so does not require training. It involves instructing participants to perform five physical performance tests (sock test, pick-up test, roll-up test, finger-tip-to-floor test and lift test) involving mobility of the trunk (542). Sock test involves participants simulating putting on a sock in the normal way from sitting. Pick-up test involves picking up a piece of paper from the floor normally. Roll-up test entails rolling up slowly from supine lying to a long sitting position with the arms relaxed. In finger-tip-to-floor test, participant stands on the floor with feet 10 centimeters apart. Participant then bends forward with straight knees and tries to touch the floor with the fingertips. The distance between the floor and the fingertips is then measured in centimeters. For the lift test, a participant repeats lifting a 5-kilogram box from the floor to a 76cm table and back to the floor for one minute. The number of lifts is then recorded. Each of the five tests has scores ranging from 0 to 3 depending on the difficulty or ease with which they are performed. A total possible score of 15 signifies maximum disability while 0 means no disability (542). The measure has good validity and
reliability: internal consistency of 0.73, moderate correlations with RMDQ ($r = 0.454$), and test-retest reliability of 0.91 (542, 545, 546).

4.3.4 Cross-cultural adaptation process

4.3.4.1 Participants for cross-cultural adaptation

Participants recruited for cross-cultural adaptation included clinical physiotherapists, non-clinical translators, and an expert committee. Translators included four clinical physiotherapists and three non-clinical translators (Igbo linguistic expert, businesswoman and microbiologist). Physiotherapist translators had between five and twenty years of clinical experience and were all practising in Nigeria except for one who had recently moved to the UK. Expert committee members included two English experts (health psychologist and academic physiotherapist) working in the United Kingdom, and two Igbo experts (clinical psychologist and clinical physiotherapist) working in Nigeria.

Pre-testing/piloting of Igbo measures (Appendix 15) was done with a convenience sample of adults living with CLBP in rural Nigeria. They were the participants in the study described in Chapter two (Study 1), who were willing to help with this study. They were informed about the study (Appendix 16), informed consent (Appendix 17) was subsequently obtained, and each then answered a complete battery of questionnaires interviewer-administered by the researcher.

4.3.4.2 Procedure for cross-cultural adaptation

Original English versions of RMDQ, WHODAS 2.0, BS-11, HADS, CSQ, MSPSS, ORFQ, BIPQ, FABQ, and the screening questions for ruling out specific CLBP were cross-culturally adapted following recommended guidelines (503) (Figure 4.1).
Stage 1: Two forward translations of original English measures to Igbo
   i. T1 (Igbo) version: bilingual Physiotherapist
   ii. T2 (Igbo) version: bilingual non-clinical translator

Stage 2: Synthesis of the two forward translations (T1 & T2) by the two translators, with CNI-C mediating discussion, to produce T-12 (Igbo) version.

Stage 3: Two back translations of T-12 (Igbo) version to English
   i. BT1 (English) version: non-clinical translator
   ii. BT2 (English) version: non-clinical translator
   iii. CNI-C: reviewed and summarised differences in BT1 and BT2 versions

Stage 4: Expert committee review produced pre-final Igbo versions
   CNI-C mediated discussion of translations and discrepancies in T1, T2, T-12, BT1 and BT2 versions with experts in UK and Nigeria.

Stage 5: Pretesting of pre-final Igbo versions with patients by CNI-C to produce the final Igbo versions.

CNI-C: The researcher

Figure 4.1: Cross-cultural adaptation stages adapted from Beaton et al. (503)

Firstly, the questionnaires were forward translated from English to Igbo by one bilingual physiotherapist and one bilingual translator from a non-clinical background. This produced two Igbo versions: T1 and T2 respectively.

Secondly, T1 and T2 were synthesized via discussion between the two forward translators, mediated by the researcher who is bilingual in English and Igbo. This produced one Igbo version: T-12. Translations were compared and discrepancies were noted.

Thirdly, the Igbo (T-12) versions of the questionnaires were back translated from Igbo to English by two back translators, blind to the original version, who were from non-clinical backgrounds. This produced two back-translated English versions: BT1 and BT2. This is a validation process ensuring that translation was consistent, and that the translated versions (T-12) were reflecting the meaning in the original measures.
Fourthly, T1, T2, T-12, BT1 and BT2 were discussed by the expert committee to produce pre-final Igbo versions of the questionnaires. The main purpose of this committee was to achieve cross-cultural equivalence in terms of semantic, idiomatic, experiential and conceptual equivalence (503). For semantic equivalence, the committee explored Igbo and English words to assess if they meant the same thing, if there were multiple meanings to an item, and if there were any grammatical difficulties in the translations. For example, the Igbo phrase for ‘people close to you’ also means ‘people near you’. Idiomatic equivalence was assured by the committee formulating alternative Igbo idioms and colloquialisms, where the English versions were difficult to translate. For example, ‘butterflies in the stomach’, an English idiomatic expression for feeling nervous, has a different Igbo equivalent ‘my breathing flying out of my stomach’. Experiential equivalence was achieved by the committee ensuring that questionnaire items were experienced similarly in English and Igbo cultures. For example, ‘wearing socks’ in a temperate western developed country may be experienced in the same way as ‘putting on foot wear’ in rural Nigeria. For conceptual equivalence, the committee determined that words in the items, instructions, and response options had similar conceptual meanings in Igbo and English cultures. For instance, ‘family’ may signify the nuclear family in a western culture, whereas it may mean both the nuclear and extended family in rural Nigeria. The expert committee also ensured that Igbo wordings were simple and could be easily understood regardless of age and educational levels.

Finally, pre-final Igbo versions of the questionnaires were field tested in rural Nigeria, among twelve participants living with CLBP, who had participated in the qualitative study described in Chapter two. The researcher interviewer-administered the measures using the ‘think-aloud’ cognitive interviewing procedure. The researcher read out each item, and requested that participants actively verbalised their thoughts as they attempted to answer each question. Participants were asked if they encountered difficulty comprehending the questionnaires, what was understood by each item, and the meaning of the chosen response. They were encouraged to keep talking while the researcher recorded their responses. This stage ensured that equivalence was maintained in the target setting to produce the final Igbo questionnaire versions, confirming face and content validity.
4.3.5 Psychometric testing of Igbo measures

4.3.5.1 Participants for psychometric testing

Participants for test-retest reliability
Based on a previous reliability study in South Africa, a minimum sample size of 27 was required per language group to detect an intra-class correlation coefficient of 0.9 and a maximum width of 0.23 for the 95% confidence interval (502). For test-retest reliability assessment, a convenient sample of 50 participants with CLBP, between the ages of 18 and 69 years, were recruited from rural and urban communities in Enugu State, South-eastern Nigeria. They were informed about the study (Appendix 16), screened (Appendix 5), and informed consent (Appendix 17) was subsequently obtained.

Participants for construct validity assessments
For exploratory factor analysis (EFA), a sample size of 150 is sufficient if the dataset has several high factor loading scores (> 0.80) (547). Validity assessments were done with a representative random sample of 200 participants living with CLBP in rural communities of Enugu State (as in Study 4 – Chapter 5).

Multistage cluster sampling was used to select rural communities, representative of rural populations in Enugu State. The seventeen Local Government Areas (LGAs) in Enugu State were split into urban and rural LGAs. Enugu South, Enugu North and Enugu East are exclusively urban LGAs, and were excluded from the sampling frame. Of the remaining fourteen LGAs, ten LGAs were randomly selected with computer generated random numbers. This was to enable each of the ten recruited research assistants, who were community health workers (CHWs), to collect data from 20 participants from each LGA. This resulted in a total of 200 participants. The recruitment of the CHWs is explained below. Each CHW randomly selected one community from each LGA by simple balloting, supervised by the researcher. Each CHW was conveniently (familiarity with area) assigned to one of the selected ten LGAs.

Following several village announcements facilitated by traditional heads in each community, each CHW met with potential participants, and provided information about
the study (Appendix 16). Two days was allowed for each potential participant to discuss their potential involvement with their family and significant others. Participants were then screened by the CHWs, by asking simple questions to rule out the ‘red flags’ for LBP (Appendix 5). This excluded any LBP associated with underlying serious pathology, radiculopathy or spinal stenosis (32, 33). This is in line with evidence-based guidelines for diagnosing CLBP (9, 11, 12, 32). Informed consent (Appendix 17) was subsequently obtained.

Inclusion criteria

- Aged 18 to 69 years, with non-specific CLBP lasting for more than 12 weeks (34).
- Negative to a simple ‘red flag’ list to rule out malignancy, spinal fracture, infection or cauda equina syndrome (31-33).
- Resident in the selected rural communities in Enugu State of South-eastern Nigeria.

Exclusion criteria

- Pregnant women, as CLBP due to pregnancy is not regarded as non-specific (34).
- People with impaired capacity to be interviewed or give informed consent, determined by family reports or subjective assessment of speech coherence.

All eligible participants were stratified into males and females. Random selection by balloting (without replacement) was aimed at ensuring an equal representation of male and female participants. Overall, a sub-sample of twenty participants was selected in each of the ten communities, by asking participants to pick a folded paper from a pool of papers containing twenty yeses’ and the rest no’s.

4.3.5.2 Procedure for psychometric testing

Academic training level of community health workers

The use of CHWs may be one strategy for addressing the shortage of health professionals in inaccessible rural populations in developing countries (548-551). CHWs are the frontline of primary health care in Nigeria and consist of three cadres:
community health extension workers (CHEWs), junior CHEWs (JCHEWs), and community health officers (CHOs) (552). A JCHEW, had had four credit level passes at West African School Certificate (WASC), National Examinations Council of Nigeria (NECO), or General Certificate of Education (GCE). Course work for JCHEW is for two years’ post-secondary school qualification, after which a certificate in community health is awarded. CHEWs are those who had had four credit level passes at WASC, NECO, or GCE O-level at not more than two sittings. A diploma in community health is usually awarded at the end of a three-year training, post-secondary school qualification. CHOs are the most senior of CHWs. CHO are holders of diploma in community health, with no less than two years of post-qualification experience, plus five credit level passes in WASC, NECO, or GCE at not more than two sittings. The course duration is two years and a higher diploma in community health is awarded on successful completion of course work. A CHO can also be a CHEW with five years’ experience and five credit level passes in WASC, NECO, or GCE O-level at not more than two sittings. They must also possess a valid practice license. The CHW training curriculum enables analytic and assessment skills, programme planning skills, communication skills, cultural competency skills, community dimension skills, public health science skills, financial/management skills and leadership thinking skills (552).

Training community health workers for data collection

CHWs were required for data collection through interviewer-administration as a significant proportion of rural dwellers in Nigeria are not literate. CHWs who were JCHEWs and in the final stages of training to become CHEWs, were recruited from the University of Nigeria Teaching Hospital (UNTH), Enugu. They were identified by the researcher’s Nigerian-based supervisor (Professor Chika Onwasigwe).

A manual (Appendix 18), based on the World Health Organisation Disability Assessment Schedule 2.0 manual (52), the ‘foundations of good survey design’ handout (553), instructions by developers of the measures, literature review, and verbal pretesting of measures, was used for training. The CHWs were trained for two weeks, for interviewer-administration of Igbo self-report measures, and objective disability assessment with the BPS.
The training was daily, face-to-face, group-based, and done by the researcher in a classroom at the University of Nigeria Teaching Hospital Enugu, Nigeria. Training was done to minimise common survey errors: coverage, sampling, measurement and non-response errors. Coverage error was avoided by obtaining a representative sample of the population through multistage cluster sampling. Sampling error was prevented through adequate sample size and gender stratification ensuring the study was not conducted among only one of many possible survey samples. Measurement error was reduced by using validated measures and tailoring CHWs’ training to avoid asking questions in ways that could bias participants’ responses. Examples include using comments like ‘I know this might not apply to you...’), or inaccurate objective measurements such as guessing measurements rather than using a tape measure. Training CHWs to assess all recruited participants whilst ensuring that no items or scales were unanswered prevented non-response errors.

The first training session covered introduction to research and multistage cluster sampling. The second to twelfth training sessions focused on the background to survey research, interviewing skills, question by question specification (including screening and the use of body charts), recording data, and ended with practical administration of outcome measures via role play. Day thirteen covered methods for participant recruitment, assessment in health/community centres, using information sheets, stratification by gender, obtaining signed/thumb printed informed consent, scheduling interview appointments, interviewer-administration of questionnaires and objective disability assessment. The session ended with question and answer sessions, where any queries were addressed. On day fourteen, the CHWs were assessed in the classroom via a clinical examination (Appendix 19). Examination questions assessed survey rationale, purpose and protocol, and practical administration of measures. The CHWs that answered all questions correctly were immediately recruited. Training was repeated for other CHWs that answered some questions wrongly until they answered all questions correctly. They were then recruited and were competent with the data collection protocol, before data collection in the field.
Data collection

An outcome measure booklet containing screening and demographic questions, and the Igbo self-report and objective measures was used by each CHW for data collection (Appendix 20). Prior to being assessed and interviewed, participants with CLBP were screened (Appendix 5), and requested to describe their pain location with a body chart (Appendix 8) to confirm CLBP. The CHWs then interviewer-administered the Igbo self-report measures. Likert scales were presented to participants as ‘flash cards’ as the corresponding item was read out to them. Measures that were not back pain-specific were made so by reading ‘back pain’ to participants in place of ‘illness’. BPS was objectively used to assess performance-based disability.

To assess test-retest reliability, measures were completed at baseline and repeated seven to ten days after first measurement. The same CHW collected data from each participant on the two occasions.

For validity assessment, measures were completed at one time-point in a cross-sectional design.

4.3.5.3 Statistical analyses

IBM SPSS version 22 was used for data analyses. Data were assessed for normality using visual (normal distribution curve and Q-Q plot), and statistical methods (Kolmogorov-Smirnov, Shapiro-Wilk’s test and Skewness/Kurtosis scores) (Appendix 21).

There was no need to handle missing data because the rigorous training of CHWs and interviewer-administration of measures ensured that no data were missing.

Reliability

Reliability assesses the ability of an instrument to measure consistently (554). Internal consistency (Cronbach’s alpha), calculated for all measures excluding the eleven-point box scale, which is a one item scale, was rated as low/weak (0-0.2), moderate (0.3-0.6) and strong (0.7-1.0) (554).
For test-retest reliability, intra-class correlation coefficient (ICC) was calculated for all measures using a two-way random effects model (which assumes that measurement errors could arise from either raters or subjects), using an absolute agreement definition between test-retest scores. 0.7, 0.8 and 0.9 represented good, very good and excellent ICCs (555, 556). Additionally, item-by-item agreement was assessed with the k statistic for the Igbo-ORFQ. Median test-retest scores with interquartile ranges was calculated for Igbo-ORFQ (non-normally distributed). Exposure to occupational biomechanical factors was expected to be stable over the short time interval between test-retest assessments. Unweighted and linearly weighted k statistic was calculated for binary and ordinally scaled Igbo-ORFQ items respectively, as was done in the original measure (500) and item-by-item agreement in other cross-culturally adapted measures (557). Additional unweighted k statistic was calculated for items 6-25 adapted for total scoring (see section 4.3.3: Occupational Risk Factor Questionnaire). Zero indicated no agreement, 0.01–0.20 as none to slight, 0.21–0.40 as fair, 0.41–0.60 as moderate, 0.61–0.80 as substantial, and 0.81–1.00 as almost perfect agreement (558).

Bland-Altman plots (559) were also used to visually assess the level of agreement between test-retest measurements by plotting mean scores against difference in total scores. This was done for all adapted measures except the Igbo-ORFQ which was developed for epidemiological but not clinical studies. Bland-Altman analysis accounted for the weakness of ICC which might indicate strong correlations between two measurements with minimal agreement (559).

Reliability was also evaluated using the standard error of measurement (SEM) and minimal detectable change (MDC) to determine if MDCs were sufficiently small to detect minimal clinically important difference (560). MDC is a statistical estimate of the smallest change detected by a measure that corresponds to a noticeable change in ability which is not due to measurement error. MDC was calculated using the standard error of measurement (SEM) which is based on the distribution method, and the reliability of the measure which takes precision into account (560). SEM was based on the standard deviation (SD) of the sample and the test-retest reliability (R) of the self-report measures, and was calculated with equation 4.1 below (560):
\[ \text{SEM} = \text{SD} \sqrt{1 - R} \]

**Equation 4.1: Standard Error of Measurement**

MDC was subsequently calculated with equation 4.2 below (560):

\[ \text{MDC} = 1.96 \times \sqrt{2} \times \text{SEM} \]

**Equation 4.2: Minimal Detectable Change**

where 1.96 derives from the 95% confidence interval of no change, and \( \sqrt{2} \) is included because two measurements are involved in measuring change (560).

**Validity**

Validity assesses the extent to which an instrument measures what it is intended to measure (554). Due to paucity of validated Igbo self-report measures, the Igbo-BS-11, a one item numeric pain intensity scale was used in the validity assessments of all measures except the Igbo-WHODAS. The BPS, an objective measure of performance based disability was used in the construct validity assessments of the self-report disability measures (Igbo-WHODAS and Igbo-RMDQ).

As there are no “gold standard” measures for any of the Igbo measures, construct validity was investigated. Construct validity evaluates the extent to which a measure assesses the construct it was intended to measure (501, 502, 556, 561, 562). The domains of construct validity assessed were convergent validity, which assesses whether two measures of the same construct that are assumed to be theoretically related, are in fact related (502); or discriminant validity which refers to the notion that two constructs that are theoretically unrelated, are in fact unrelated (556). Convergent and discriminant validity were assessed with Pearson’s and Spearman’s correlation coefficients for parametric and non-parametric data respectively, and were rated as weak (0-0.2), moderate (0.3-0.6), and strong (0.7-1.0) (563).
Igbo-RMDQ assesses pain-related disability. Therefore, it is expected to correlate at least moderately with pain intensity (Igbo BS-11) (557, 564, 565) and performance-based disability (BPS) (566, 567).

Igbo-WHODAS 2.0, measures generic disability, therefore, it is expected to correlate with performance based disability. As BPS measures mobility-related disability in people with LBP (542), the mobility domain of the Igbo-WHODAS 2.0 is expected to have a stronger correlation with BPS than the other subscales. The cognition subscale should have a lower correlation with BPS than the other subscales (52, 53).

Pain intensity is suggested to have low to moderate correlations with performance-based disability (568, 569). Therefore, Igbo-BS-11 should have at least a low correlation with BPS which measures mobility limitation due to LBP (542).

There was no fear avoidance, anxiety and depression, coping strategies, social support, occupational biomechanical and illness perceptions measures that could have been used to validate the Igbo-FABQ, Igbo-HADS, Igbo-CSQ, Igbo-MSPSS, Igbo-ORFQ and Igbo-BIPQ respectively. Therefore, the reported relationships these measures had with pain intensity were used for validity assessment.

As fear avoidance beliefs assesses pain-related fear (147, 149, 570, 571), Igbo-FABQ is expected to have at least a moderate correlation with pain intensity as suggested in the literature (539, 570, 572-574).

Igbo-HADS is expected to have at least a moderate correlation with Igbo-BS-11 as the literature shows that anxiety and depression are at least moderately correlated with pain intensity (139, 575, 576).

For the Igbo CSQ subscales, catastrophising subscale is expected to have at least a moderate correlation with pain intensity as suggested in people with CLBP (154, 163, 166). Diverting attention (186), reinterpreting pain sensations (186), praying and hoping (186, 577), and increased behavioural activities (186) subscales should have low to moderate correlations with pain intensity. Ignoring pain sensations and coping self-statements subscales should not be significantly correlated with pain intensity (186, 577). CSQ items: pain control and pain decrease would be negatively correlated with pain intensity (184).
The literature suggests that social support is not significantly correlated with pain intensity in people with CLBP (578, 579), therefore the Igbo-MSPSS is expected to have no correlation with Igbo-BS-11.

There is some evidence that occupational biomechanical exposure predicts early onset LBP (540, 541, 580). The Igbo-ORFQ should be able to predict first onset LBP in rural Nigeria in future longitudinal studies in Nigeria. Therefore, the validity of the Igbo-ORFQ could not be assessed in this cross-sectional study.

As illness perceptions are significantly associated with pain-related disability in people with CLBP (164, 173), and have a moderate positive correlation with pain intensity (178), Igbo-BIPQ is expected to also have at least a moderate correlation with pain intensity.

Exploratory factor analyses (EFA) was used to determine the number of factors influencing each Igbo measure, i.e. the items that go together (dimensionality) (547). EFA was done for the measures with subscales: Igbo-WHODAS, Igbo-HADS, Igbo-CSQ, Igbo-MSPSS and Igbo-FABQ. EFA was applied according to Kaiser Meyer Olkin (KMO) and the Bartlett’s test with a minimum eigenvalue for retention set at $\geq 1.0$ (Kaiser’s rule) (581). Retained and excluded factors were also explored visually on a scree plot. Promax (oblique) rotation, which assumes that factors can be related, was done, and factor loadings less than 0.3 were suppressed as recommended (547). Extraction was done using principal axis factoring. The number of factors and the underlying relationships between the items were then compared with the factor structures of the original measures to enhance an understanding of the differences in population (rural Nigerian versus western) characteristics. However, total scores (most times) and the original subscales of the measures were used in the analyses because the factor structures of the Igbo measures may not be definitive due to small sample sizes, high illiteracy rates and possible measurement errors.
4.4 Results

4.4.1 Cross-cultural adaptation

4.4.1.1 Participants pre-testing Igbo pre-final questionnaires

Table 4.1 below shows that slightly over half of the twelve participants living with CLBP in rural Nigeria were males and manual workers, including farmers, panel beaters and welders. Non-manual workers were civil servants and traders. Majority were from the Pentecostal Christian religion, married, with secondary education. Half of them were literate in English only.

| Table 4.1: Demographic characteristics of participants pre-testing adapted measures |
|------------------------|-----------------|----------------|
|                        | Frequency | %            |
| Mean age= 45 years     |           |              |
| GENDER                 |           |              |
| Male                   | 7         | 58.33        |
| Female                 | 5         | 41.67        |
| MAIN OCCUPATION        |           |              |
| Manual workers         | 7         | 58.33        |
| Non-manual workers     | 5         | 41.67        |
| RELIGION (CHRISTIAN DENOMINATION) | | |
| Protestant Pentecostal | 10       | 83.33        |
| Catholic               | 2         | 16.67        |
| MARITAL STATUS         |           |              |
| Married                | 11        | 91.67        |
| Single                 | 1         | 8.33         |
| EDUCATIONAL LEVEL COMPLETED |       |              |
| Secondary              | 4         | 33.33        |
| Primary                | 3         | 25.00        |
| None                   | 3         | 25.00        |
| Tertiary               | 2         | 16.67        |
| LITERACY (ABILITY TO READ AND WRITE) | | |
| Illiterate (inability to read and write) | 4 | 33.33 |
| English                | 6         | 50.00        |
| English and Igbo       | 2         | 16.67        |
4.4.1.2 Translation, comprehensibility and cultural equivalence of self-report measures

Screening questions
There were no major discrepancies in the forward and back translations of the screening questions. The expert review committee decided to retain the synthesized forward translation. Questions were easily understood by participants during pre-testing. However, ‘do you lack sensation in your buttocks or private part’ was modified to ‘do you lack sensation anywhere in your body’ because some participants found it embarrassing during pre-testing. Any positive answer was then probed to determine body part.

Igbo-RMDQ
There were no major translation problems. The expert review committee introduced two extra clauses in the Igbo-RMDQ instruction: ‘or when someone reads them to you’ and ‘or tell the person that read it to you to mark your response’ to give the option of interviewer-administration.

T1 and T2 translators used different Igbo dialects and sentence structures for many items. These were resolved during syntheses, back translations and expert committee review by using central/official Igbo dialect and sentence structures that retained meaning closest to the original item. In item 1, ‘nearly all the time’ was used to better reflect the original item as the same Igbo phrase means ‘many times’ or ‘most of the time’. Item 5 was translated differently: ‘I hold onto something...’ and ‘I hold onto a stick...’ because there is no Igbo word for ‘handrail’. Through consensus of all translators, ‘I hold onto the step hand...’ was used as the Igbo equivalent means the same thing as the original item. For item 16, a new phrase ‘or my foot wear’ was added by the team to better reflect the social context of rural Nigeria where many people do not wear socks. For item 23, a new phrase ‘or uphill’ was added to the original item to reflect rural Nigeria where many dwellers lived in bungalows with hilly terrains. Through consensus of all translators, ‘I lie down’ was used in place of ‘I stay in bed’ in item 24, as some rural
Nigerian dwellers do not lie on beds. During pretesting of Igbo-RMDQ, Igbo word for ‘waist pain’ was how participants understood LBP. Literal Igbo translation of LBP was understood as pain of the entire back. Therefore ‘waist pain’ was used in place of LBP. ‘Waist pain’ was similarly utilised in the other measures.

**Igbo-WHODAS 2.0**

There were no substantial issues with translation. The expert committee decided to retain instructions meant for only the interviewer in English as literate people found it easier to read/write English than Igbo (376). Instructions to patients were cross-culturally adapted into Igbo. The committee added ‘waist pain’ to ‘illness(es)’ to make the measure back pain-specific for this study while allowing the measure to be used for other conditions in future studies. In item D1.3, translators wrote ‘understanding and finding out solutions’ as a translation of ‘analysing and finding solutions’. This was modified to the Igbo equivalent of ‘probing/exploring/researching’ and ‘find out/discover solutions’ by the expert review team to better reflect the original item as there is no Igbo word for ‘analyse’. The Igbo phrase for ‘people close to you’ also means ‘people near you’. The latter will not reflect the original item D4.3. Therefore, translators used the Igbo phrase for ‘family and friends’ to better represent ‘people close to you’. In the instruction for domain 6, forward translators translated ‘how you do things in your community’. Discrepancy was detected after back translation; hence the phrase was changed to ‘how you join in activities that are associated with your community’. ‘...affected your heart or spirit’ was used in place of ‘emotionally affected’ in item D6.5 as there is no Igbo word for emotion, through consensus of the translators. In item D6.6, ‘deplete or affect’ was used in place of ‘drain’. In D6.1, ‘to what extent’ rather than ‘how many’ was used to better reflect the original item.

**Igbo-BS-11**

Cross-cultural adaptation of the BS-11 was fairly simple. Expert review committee decided to insert additional anchors of pain descriptors for response two (small pain), four (pain is not too much), six (severe pain) and eight (very severe pain). This was to
enhance clarity in this population with low literacy rates, improve discrimination for detecting small changes, and enhance comprehensibility, in line with the literature (492, 520, 582). The anchors were easily understood by participants with CLBP during verbal pretesting.

**Igbo-HADS**

The HADS was difficult to cross-culturally adapt because emotional concepts are unclear in this culture. Problems were found especially with the literal translation of idioms and colloquialisms by the two forward translators. Back translations showed the deficiencies in the forward translations. Of the seven items for each subscale, only two items for each subscale reflected the original items. These were: depression- ‘I still enjoy the things I used to enjoy’ and ‘I feel cheerful’; anxiety- ‘I get a sort of a frightened feeling as if something awful is about to happen’ and ‘I feel restless as if I have to be on the move’. All the items in the HADS were reviewed again by the expert committee. An Igbo clinical Psychologist (BSc, MSc and PhD in clinical Psychology, with over 15 years of clinical experience with Igbo patients) in the expert review committee, forward translated the problematic items again. Modifications included using equivalent Igbo idioms and colloquialisms in place of the English ones. Examples included replacing ‘wound up’ with its Igbo equivalent ‘not relaxed’, and ‘butterflies in the stomach’ with its Igbo equivalent ‘my breathing flying out of my stomach’. Repeat back-translations of the HADS by two translators showed that all items had achieved conceptual equivalence while retaining cultural sensitivity. During verbal pre-testing, some participants with CLBP understood the Igbo word for ‘restless’ in item A11 as ‘useless in life’. An Igbo phrase ‘I don’t have rest’, understood by participants as ‘restless’ was used instead, in combination with another Igbo phrase ‘I am not able to stay still…,’ to reflect the original item, in agreement with the Igbo clinical psychologist.

**Igbo-CSQ**

Cross-cultural adaptation of the CSQ was without major difficulties. During the synthesis of forward translations of item 1, forward translators decided to use the Igbo equivalent of ‘I try to forget the pain or behave as if the pain is not in my body…’ in place of ‘I try to feel distant from the pain...’ as there is no Igbo phrase for ‘feel distant’. Similarly, in item
12, the team used Igbo version of ‘I play some different games in my mind or play mental games…’ in place of ‘I play mental games…’ as the literal translation is an idiomatic Igbo expression that was not understood by everyone especially younger people. For item 29, translators agreed on ‘...is not inside my body’ which echoes the original item because there is no Igbo phrase for ‘...outside of my body’. For item 42, there are no Igbo words for ‘active’ and ‘project’ hence the team agreed on ‘I do something that involves moving my body like doing household chores or other works’ to reflect the original item ‘I do something active, like household chores or projects’. Comprehension of CSQ was confirmed during verbal pre-testing although participants found it easier selecting the three anchors in the Likert scale: 0, 3 or 6. Participants also reported that they did not do most of the activities reflected in the items.

Igbo-MSPSS
Cross-cultural adaptation of the MSPSS was straightforward. The forward translation team decided on ‘there is a special person that shares/partakes in my joys and my sorrows/mourning’ to reflect the original item 2 as ‘sorrow’ and ‘mourning’ are homographs in Igbo. There were no ambiguous meanings during the expert review by the committee. It was found easily understandable during field verbal pretesting with the participants with CLBP.

Igbo-ORFQ
There were no major disagreements between forward and back translators in relation to this measure. There is no indigenous Igbo word for ‘percentage’ in the response options of the ORFQ, which was spelt in Igbo as ‘pecenti’, in line with Igbo grammar. An extra statement explaining these percentages in terms of number of work days per week was added to enhance understanding with illiterate people. Similarly, for item 8, there is no indigenous Igbo word for ‘...degrees’ which was spelt as ‘digrii’, as done in Igbo grammar texts. ‘Kilograms’ was added to statements with ‘pounds’ as this is a more familiar measurement unit in Nigeria. Furthermore, as illiterate rural dwellers may have limited ability to think in abstract terms, the weights of objects commonly used in this environment corresponding to the weights named in the ORFQ items were added. During the expert committee review, it was decided that in addition to reading out the
Igbo-ORFQ items to participants, each movement/activity would be demonstrated by the interviewer to ensure comprehension by all. This was found useful during verbal pre-testing.

Igbo-BIPQ
The BIPQ was straightforward to cross-culturally adapt. Expert review committee added ‘waist pain’ to ‘illness’ to make the measure back pain-specific for this study while allowing the measure to be used for other conditions in future studies. Forward translations were similar but back-translations revealed minor discrepancies in items 1, 3 and 5. The initial translation of ‘how does your illness (waist pain) affect your life?’ was modified to ‘to what extent does your illness (waist pain) affect your life?’ This better reflects the original item 1 ‘how much does your illness affect your life?’ as ‘how’ and ‘how much’ are homographs in Igbo. Similarly, for item 3, back translation showed the item was translated as ‘what kind of control do you have over your back pain?’ The team corrected the item to ‘what extent of control do you feel you have over your back pain?’ to reflect the original item. In this context, the Igbo word for ‘think or feel’ are homographs. In item 5, ‘how many’ was used in place of ‘how much’ as ‘how’ and ‘how much’ are homographs in Igbo. Therefore, the expert review committee used the Igbo equivalent of ‘to what extent’ to better reflect the original item. In item 8, ‘…affect your heart or spirit’ was used as there is no Igbo word for ‘…emotionally’. During verbal pre-testing in the field, the Igbo word for ‘symptoms’ in item 5 was confusing to younger participants, hence the English word was included in bracket and both were read out which facilitated understanding.

Igbo-FABQ
The cross-cultural adaptation was straightforward. Item 8, ‘I have a claim for compensation for my pain’ was modified to the Igbo equivalent of ‘I have a compensation or gains I get from having my pain’ as there is no social benefit in rural Nigeria. The Igbo phrase for ‘physical activity’ could also mean ‘being active’ or ‘moving the body’ or ‘moving about’ and was used in the items with ‘physical activity’. During field verbal pretesting, participants were more likely to select anchors: 0, 3 and 6.
4.4.2 Psychometric properties of Igbo self-report measures

4.4.2.1 Tests of normality results for cross-sectional validity testing

BPS, Igbo-RMDQ, Igbo-BS-11, Igbo-HADS subscales, and Igbo-BIPQ were normally distributed, whereas Igbo-MSPSS, Igbo-FABQ and subscales, Igbo-ORFQ, and subscales of the Igbo-CSQ had non-normal distributions (Appendix 21).

4.4.2.2 Participants for test-retest reliability and cross-sectional validity testing

The demographic characteristics of the two samples are presented in Tables 4.2 and 4.3 below. Table 4.2 presents the test-retest sample of 50 participants with CLBP. A majority were females, married, in paid work or self-employed. Slightly less than half were rural dwellers in Enugu state. Participants were mostly middle aged with secondary level of education.

Table 4.3 presents 200 participants in the cross-sectional validity testing (see Chapter 5, Figure 5.3). They were all rural dwellers in Enugu state. Nearly equal numbers were males. They were middle aged with primary level of education. A majority were married and self-employed. There were no missing data for all samples.
Table 4.2: Demographic characteristics of participants for test-retest reliability testing

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency (%)</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>32 (64.0)</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>18 (36.0)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Habitation</th>
<th>Frequency (%)</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>20 (40.0)</td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>30 (60.0)</td>
<td></td>
</tr>
</tbody>
</table>

| Age (years)    | 45.2 (11.55)  |           |

| Education (years) | 13.3 (7.14) |

<table>
<thead>
<tr>
<th>Current marital status</th>
<th>Frequency (%)</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currently married</td>
<td>37 (74.0)</td>
<td></td>
</tr>
<tr>
<td>Never married</td>
<td>8 (16.0)</td>
<td></td>
</tr>
<tr>
<td>Widowed</td>
<td>4 (8.0)</td>
<td></td>
</tr>
<tr>
<td>Separated</td>
<td>1 (2.0)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Work status</th>
<th>Frequency (%)</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paid work</td>
<td>25 (50.0)</td>
<td></td>
</tr>
<tr>
<td>Self-employed (own business or farming)</td>
<td>19 (38.0)</td>
<td></td>
</tr>
<tr>
<td>Keeping house/homemaker</td>
<td>2 (4.0)</td>
<td></td>
</tr>
<tr>
<td>Student</td>
<td>2 (4.0)</td>
<td></td>
</tr>
<tr>
<td>Non-paid work (volunteer or charity)</td>
<td>1 (2.0)</td>
<td></td>
</tr>
<tr>
<td>Unemployed (health reasons)</td>
<td>1 (2.0)</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.3: Demographic characteristics of participants for cross-sectional validity testing

<table>
<thead>
<tr>
<th>Sex</th>
<th>n (%)</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>112 (56.0)</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>88 (44.0)</td>
<td></td>
</tr>
</tbody>
</table>

| Age (years) | 48.6 (12.0) |

| Education (years) | 7.0 (6.4) |

<table>
<thead>
<tr>
<th>Current marital status</th>
<th>Frequency (%)</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currently married</td>
<td>143 (71.5)</td>
<td></td>
</tr>
<tr>
<td>Widowed</td>
<td>31 (15.5)</td>
<td></td>
</tr>
<tr>
<td>Never married</td>
<td>22 (11.0)</td>
<td></td>
</tr>
<tr>
<td>Cohabiting</td>
<td>2 (1.0)</td>
<td></td>
</tr>
<tr>
<td>Separated</td>
<td>2 (1.0)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Work status</th>
<th>Frequency (%)</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-employed (own business or farming)</td>
<td>125 (62.5)</td>
<td></td>
</tr>
<tr>
<td>Paid work</td>
<td>31 (15.5)</td>
<td></td>
</tr>
<tr>
<td>Non-paid work (volunteer or charity)</td>
<td>16 (8.0)</td>
<td></td>
</tr>
<tr>
<td>Keeping house/homemaker</td>
<td>13 (6.5)</td>
<td></td>
</tr>
<tr>
<td>Student</td>
<td>7 (3.5)</td>
<td></td>
</tr>
<tr>
<td>Unemployed (health reasons)</td>
<td>4 (2.0)</td>
<td></td>
</tr>
<tr>
<td>Unemployed (other reasons)</td>
<td>3 (1.5)</td>
<td></td>
</tr>
<tr>
<td>Retired</td>
<td>1 (0.5)</td>
<td></td>
</tr>
</tbody>
</table>
4.4.2.3 Igbo-RMDQ

Table 4.4: Reliability of Igbo-RMDQ

| Number of items: 24; Cronbach’s alpha global score: 0.91; ICC (95% CI): 0.84 (0.71, 0.91) |
| Cronbach’s alpha If Item Deleted |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 0.89 | 0.89 | 0.90 | 0.90 | 0.90 | 0.89 | 0.89 | 0.90 |
| 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 0.90 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.90 | 0.89 |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 0.90 | 0.90 | 0.90 | 0.90 | 0.89 | 0.90 | 0.89 | 0.89 |

SEM: 2.53 MDC: 7.01

Internal consistency was excellent (α = 0.91), and intraclass correlation coefficient was very good (ICC = 0.84) for Igbo-RMDQ. Standard error of measurement and minimal detectable change were 2.53 and 7.01 respectively (Table 4.4).

Figure 4.2: Bland-Altman plot for test-retest agreement of Igbo-RMDQ

There was acceptable agreement between test-retest values of the Igbo-RMDQ as mean difference was close to zero and most points were within the 95% limits of agreement of the mean difference (Figure 4.2).
**Table 4.5:** Pearson’s correlation between Igbo-RMDQ, performance-based disability and pain intensity

<table>
<thead>
<tr>
<th></th>
<th>BPS</th>
<th>Igbo-BS-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Igbo-RMDQ</td>
<td>646**</td>
<td>.608**</td>
</tr>
</tbody>
</table>

**p<0.01**

Igbo-RMDQ had moderately high correlations (r>0.6) with performance-based disability (BPS) and pain intensity (Igbo-BS-11) (Table 4.5).
### Igbo-WHODAS

**Table 4.6: Reliability of Igbo-WHODAS**

<table>
<thead>
<tr>
<th>Igbo-WHODAS total score</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of items: 36; Cronbach’s alpha global score: 0.97; ICC (95% CI): 0.93 (0.88, 0.96)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cronbach’s alpha If Item Deleted</td>
<td>D1.1</td>
<td>D1.2</td>
<td>D1.3</td>
<td>D1.4</td>
<td>D1.5</td>
<td>D1.6</td>
</tr>
<tr>
<td>0.97</td>
<td>0.97</td>
<td>0.97</td>
<td>0.97</td>
<td>0.97</td>
<td>0.97</td>
<td>0.97</td>
</tr>
<tr>
<td>D2.3</td>
<td>D2.4</td>
<td>D2.5</td>
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SEM: 5.05  MDC: 13.99

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SEM: 7.20  MDC: 19.96

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SEM: 8.00  MDC: 22.17

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SEM: 7.20  MDC: 20.35

<table>
<thead>
<tr>
<th>Igbo-WHODAS 2.0 (getting along with people)</th>
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SEM: 7.20  MDC: 20.35

<table>
<thead>
<tr>
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</tr>
<tr>
<td>Cronbach’s alpha If Item Deleted</td>
<td>D5.1</td>
<td>D5.2</td>
<td>D5.3</td>
<td>D5.4</td>
<td>D5.5</td>
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SEM: 8.70  MDC: 24.11

<table>
<thead>
<tr>
<th>Igbo-WHODAS 2.0 (participation)</th>
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<th></th>
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<tbody>
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<td>Number of items: 8; Cronbach’s alpha global score: 0.92; ICC (95% CI): 0.85 (0.73, 0.91)</td>
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<tr>
<td>Cronbach’s alpha If Item Deleted</td>
<td>D6.1</td>
<td>D6.2</td>
<td>D6.3</td>
<td>D6.4</td>
<td>D6.5</td>
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</table>

SEM: 11.10  MDC: 30.77
Internal consistency was excellent ($\alpha \approx 0.9$) for total scoring of Igbo-WHODAS 2.0 and subscales: cognition, mobility, life activities and participation; good ($\alpha \approx 0.8$) for self-care subscale and deletion of item three increased internal consistency to 0.81; getting along subscale and deletion of item D4.5 increased internal consistency to 0.83. Excellent intraclass correlation coefficients (ICC $\approx 0.9$) were observed for total scoring of Igbo-WHODAS 2.0, and cognition, mobility, life activities and participation subscales; very good intraclass correlation coefficients (ICC $\approx 0.8$) were seen for self-care and getting along subscales. Standard error of measurement and minimal detectable change were 5.05 and 13.99 for total scoring of Igbo-WHODAS 2.0; 7.20 and 19.96 for cognition subscale; 8.00 and 22.17 for mobility subscale; 7.20 and 20.35 for self-care subscale; 7.60 and 21.07 for getting along with people subscale; 8.70 and 24.11 for life activities subscale; 11.10 and 30.77 for participation subscale (Table 4.6).

![Bland-Altman plot for test-retest agreement of Igbo-WHODAS 2.0 (total score)](image)

**Figure 4.3:** Bland-Altman plot for test-retest agreement of Igbo-WHODAS 2.0 (total score)
Figure 4.4: Bland-Altman plot for test-retest agreement of Igbo-WHODAS 2.0 (cognition)
**Figure 4.5**: Bland-Altman plot for test-retest agreement of Igbo-WHODAS 2.0 (mobility)

**Figure 4.6**: Bland-Altman plot for test-retest agreement of Igbo-WHODAS 2.0 (self-care)
**Figure 4.7:** Bland-Altman plot for test-retest agreement of Igbo-WHODAS 2.0 (getting along with people)

**Figure 4.8:** Bland-Altman plot for test-retest agreement of Igbo-WHODAS 2.0 (life activities)
There were acceptable agreements between test-retest values of the Igbo-WHODAS and its subscales as mean differences were close to zero and most points were within the 95% limits of agreement of the mean differences (Figures 4.3 to 4.9).

**Figure 4.9:** Bland-Altman plot for test-retest agreement of Igbo-WHODAS 2.0 (participation)

Igbo-WHODAS and its subscales correlated moderately ($r_s \approx 0.3$) with performance-based disability (BPS) except the cognition subscale with the least correlation ($r_s = 0.19$). The mobility subscale had the second strongest correlation ($r_s = 0.35$) following the participation subscale (Table 4.7).

**Table 4.7:** Spearman’s correlation between Igbo-WHODAS and performance-based disability

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<th>Igbo-WHODAS</th>
<th>BPS</th>
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<td>self-care</td>
<td>0.28**</td>
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<tr>
<td>getting along</td>
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<tr>
<td>life activities</td>
<td>0.33**</td>
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<tr>
<td>participation</td>
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**p<0.01**
Table 4.8: Exploratory factor analysis of the Igbo-WHODAS

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</table>

Only factor loadings above 0.3 are shown; KMO= Kaiser-Meyer-Olkin measure of sampling adequacy; \( \chi^2 = \text{Bartlett’s test of sphericity tested with chi-square} \); Extraction Method: Principal Axis Factoring; Rotation Method: Promax with Kaiser Normalization; Rotation converged in 11 iterations.

A seven-factor solution of the Igbo-WHODAS was produced. 62.79% of the items had factor loadings above 0.5 and 66.67% of the items loaded on their corresponding factor.
in the original measure. Factor 1 matches the life (household and work/school) activities subscale of the original measure. However, additional two items from the original participation subscale (joining in community activities and doing things by oneself/relaxation), and one item from the original self-care subscale (staying by yourself for a few days) loaded on factor 1. Factor 2 corresponds to getting along subscale of the original measure, with additional loadings from one item of the original participation subscale (living with dignity), and one item of the original cognition subscale (understanding what people say). Factor 3 matches the mobility subscale of the original measure, but with two additional items from the original participation subscale (time spent on back pain and emotional effects of back pain) loading on it. Factor 4 corresponds to the cognition subscale of the original measure except that one of the items in the original subscale (understanding what people say) loaded on the getting along factor. Factor 5 (participation subscale) had only two items that loaded on it (back pain drained financial resources and back pain caused family problems). It was the least precise as items from the original participation subscale loaded on all factors except the self-care factor. Factor 6 matches the self-care subscale of the original measure except for one missing item (staying by yourself for a few days) that loaded on the life activities factor. Factor 7 had only one major item (barriers and hindrances in the world around you due to back pain) from the original participation subscale (Table 4.8).

4.4.2.5 Igbo-BS-11

Table 4.9: Reliability of Igbo-BS-11

<table>
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<th>ICC (95% CI):</th>
<th>0.71 (0.49, 0.84)</th>
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<tbody>
<tr>
<td>SEM:</td>
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<tr>
<td>MDC:</td>
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</tbody>
</table>

Good intraclass correlation coefficient (ICC ≃ 0.7) was observed for Igbo-BS-11. Standard error of measurement and minimal detectable change were 1.18 and 3.28 respectively (Table 4.9).
There was acceptable agreement between test-retest values of the Igbo-BS-11 as mean difference was close to zero and most points were within the 95% limits of agreement of the mean difference (Figure 4.10).

Table 4.10: Pearson’s correlation between Igbo-BS-11 and performance-based disability

<table>
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<tr>
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<th>BPS</th>
</tr>
</thead>
<tbody>
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<td>Igbo-BS-11</td>
<td>0.42**</td>
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</tbody>
</table>

**p<0.01

Igbo-BS-11 had a moderate correlation (r=0.42) with performance-based disability (BPS) (Table 4.10).
4.4.2.6 Igbo-HADS

**Table 4.11: Reliability of Igbo-HADS**

<table>
<thead>
<tr>
<th><strong>Igbo-HADS anxiety subscale</strong></th>
<th>Number of items: 7; Cronbach’s alpha global score: 0.78; ICC (95% CI): 0.76 (0.58, 0.86)</th>
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<tbody>
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</tr>
<tr>
<td>SEM: 2.25</td>
<td>MDC: 6.23</td>
</tr>
<tr>
<td>A1</td>
<td>0.78</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Igbo-HADS depression subscale</strong></th>
<th>Number of items: 7; Cronbach’s alpha global score: 0.67; ICC (95% CI): 0.75 (0.55, 0.86)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach’s alpha If Item Deleted</td>
<td>D2</td>
</tr>
<tr>
<td>SEM: 1.82</td>
<td>MDC: 5.06</td>
</tr>
<tr>
<td>D2</td>
<td>0.62</td>
</tr>
</tbody>
</table>

Internal consistency was good (α = 0.78) for the anxiety subscale of Igbo-HADS and deletion of item A7 (relaxed) increased it to 0.79; acceptable (α = 0.67) for depression subscale of Igbo-HADS and deletion of items D8 (reduced energy) and D14 (leisure time enjoyment) increased it to 0.68. Intraclass correlation coefficients were very good (ICC ≃ 0.8) for the anxiety and depression subscales. Standard error of measurement and minimal detectable change were 2.25 and 6.23 for anxiety subscale; 1.82 and 5.06 for depression subscale (Table 4.11).
There was acceptable agreement between test-retest values of the Igbo-HADS anxiety and depression subscales as mean differences were close to zero and most points were within the 95% limits of agreement of the mean differences (Figures 4.11 and 4.12).
Table 4.12: Pearson’s correlation between Igbo-HADS and pain intensity

<table>
<thead>
<tr>
<th></th>
<th>Igbo-BS-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Igbo-HADS (anxiety)</td>
<td>0.48**</td>
</tr>
<tr>
<td>Igbo-HADS (depression)</td>
<td>0.37**</td>
</tr>
</tbody>
</table>

*p<0.01

Anxiety and depression subscales of Igbo-HADS correlated moderately (r>0.3) with pain intensity (Igbo-BS-11) (Table 4.12).

Table 4.13: Exploratory factor analysis of the Igbo-HADS

<table>
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<td>Something awful</td>
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<tr>
<td>Sudden panic</td>
<td>.666</td>
<td></td>
</tr>
<tr>
<td>Restlessness</td>
<td>.651</td>
<td></td>
</tr>
<tr>
<td>Worrying thoughts</td>
<td>.628</td>
<td></td>
</tr>
<tr>
<td>Wound up</td>
<td>.623</td>
<td></td>
</tr>
<tr>
<td>Lost interest in appearance</td>
<td>.559</td>
<td></td>
</tr>
<tr>
<td>Butterflies in the stomach</td>
<td>.510</td>
<td></td>
</tr>
<tr>
<td>Slowed down</td>
<td>.473</td>
<td></td>
</tr>
<tr>
<td>Funny side of things</td>
<td></td>
<td>.675</td>
</tr>
<tr>
<td>Sit at ease and feel relaxed</td>
<td></td>
<td>.542</td>
</tr>
<tr>
<td>Still enjoy things I used to enjoy</td>
<td></td>
<td>.438</td>
</tr>
<tr>
<td>Enjoy book, radio, tv</td>
<td></td>
<td>.403</td>
</tr>
<tr>
<td>Look forward with enjoyment to things</td>
<td></td>
<td>.392</td>
</tr>
<tr>
<td>Feel cheerful</td>
<td></td>
<td>.378</td>
</tr>
</tbody>
</table>

KMO= 0.82
Χ²= 617.22***

Only factor loadings above 0.3 are shown; KMO= Kaiser-Meyer-Olkin measure of sampling adequacy; Χ²= Bartlett’s test of sphericity tested with chi-square ***p<0.001; Extraction Method: Principal Axis Factoring; Rotation Method: Promax with Kaiser Normalization; Rotation converged in 3 iterations

A two-factor solution of the Igbo-HADS was produced. 64.29% of the items had factor loadings above 0.5 and 78.57% of the items loaded on their corresponding factor in the original measure: 85.71% for anxiety subscale; 71.43% for depression subscale. Factor 1 corresponds to the anxiety subscale of the original measure except for one missing item (sit at ease and feel relaxed) that loaded on the depression factor, and two items of the depression subscale (slowed down, and lost interest in appearance) that loaded on the anxiety factor. Factor 2 matches the depression subscale of the original measure except that one item (sit at ease and feel relaxed) from the original anxiety subscale loaded on
the depression factor, and two items of the original depression subscale (slowed down, and lost interest in appearance) loaded on the anxiety factor (Table 4.13).

4.4.2.7 Igbo-CSQ

Table 4.14: Reliability of Igbo-CSQ

<table>
<thead>
<tr>
<th>Igbo-CSQ (diverting attention)</th>
<th>Number of items: 6; Cronbach’s alpha global score: 0.73; ICC (95% CI): 0.89 (0.79, 0.94)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach’s alpha if item deleted</td>
<td>3 9 12 26 27 38</td>
</tr>
<tr>
<td>SEM: 2.43 MDC: 6.73</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Igbo-CSQ (reinterpretating pain sensation)</th>
<th>Number of items: 6; Cronbach’s alpha global score: 0.81; ICC (95% CI): 0.93 (0.88, 0.96)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach’s alpha if item deleted</td>
<td>1 4 10 16 29 41</td>
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<tr>
<td>SEM: 3.58 MDC: 9.92</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Igbo-CSQ (catastrophising)</th>
<th>Number of items: 6; Cronbach’s alpha global score: 0.85; ICC (95% CI): 0.77 (0.60, 0.87)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach’s alpha if item deleted</td>
<td>5 11 13 25 33 37</td>
</tr>
<tr>
<td>SEM: 2.51 MDC: 6.96</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Igbo-CSQ (ignoring pain sensations)</th>
<th>Number of items: 6; Cronbach’s alpha global score: 0.66; ICC (95% CI): 0.80 (0.64, 0.89)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach’s alpha if item deleted</td>
<td>17 19 21 24 30 35</td>
</tr>
<tr>
<td>SEM: 2.96 MDC: 8.20</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Igbo-CSQ (praying or hoping)</th>
<th>Number of items: 6; Cronbach’s alpha global score: 0.86; ICC (95% CI): 0.90 (0.82, 0.94)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach’s alpha if item deleted</td>
<td>14 15 18 22 28 36</td>
</tr>
<tr>
<td>SEM: 2.09 MDC: 5.79</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Igbo-CSQ (coping self-statements)</th>
<th>Number of items: 6; Cronbach’s alpha global score: 0.79; ICC (95% CI): 0.91 (0.84, 0.95)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach’s alpha if item deleted</td>
<td>6 8 20 23 31 32</td>
</tr>
<tr>
<td>SEM: 2.18 MDC: 6.04</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Igbo-CSQ (increased behavioural activities)</th>
<th>Number of items: 6; Cronbach’s alpha global score: 0.77; ICC (95% CI): 0.91 (0.84, 0.95)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach’s alpha if item deleted</td>
<td>2 7 34 39 40 42</td>
</tr>
<tr>
<td>SEM: 2.52 MDC: 6.98</td>
<td></td>
</tr>
</tbody>
</table>
Internal consistency was excellent ($\alpha \approx 0.9$) for catastrophising and praying/hoping subscales of Igbo-CSQ; good ($\alpha \approx 0.8$) for reinterpreting pain sensation subscale, and no item deletion increased internal consistency; coping self-statements subscale, and no item deletion increased internal consistency; increased behavioural activities subscale, and deletion of item 7 increased internal consistency to 0.78; acceptable ($\alpha \approx 0.7$) for diverting attention subscale of Igbo-CSQ, and no item deletion increased internal consistency; and ignoring pain sensations subscale, and deletion of item 17 increased internal consistency to 0.69.

Excellent intraclass correlation coefficients ($\text{ICC} \approx 0.9$) were observed for diverting attention, praying or hoping, coping self-statements and increased behavioural activities subscales of Igbo-CSQ; very good ($\text{ICC} \approx 0.8$) for reinterpreting pain sensation, catastrophising and ignoring pain sensations subscales. Standard error of measurement (SEM) and minimal detectable change (MDC) were 2.43 and 6.73 for diverting attention subscale; 3.58 and 9.92 for reinterpreting pain sensation subscale; 2.51 and 6.96 for catastrophising subscale; 2.96 and 8.20 for ignoring pain sensations subscale; 2.09 and 5.79 for praying or hoping subscale; 2.18 and 6.04 for coping self-statements subscale; 2.52 and 6.98 for increased behavioural activities subscale (Table 4.14).

**Figure 4.13**: Bland-Altman plot for test-retest agreement of Igbo-CSQ (diverting attention)
Figure 4.14: Bland-Altman plot for test-retest agreement of Igbo-CSQ (reinterpreting pain sensation)

Figure 4.15: Bland-Altman plot for test-retest agreement of Igbo-CSQ (catastrophising)
Figure 4.16: Bland-Altman plot for test-retest agreement of Igbo-CSQ (ignoring pain sensations)

Figure 4.17: Bland-Altman plot for test-retest agreement of Igbo-CSQ (praying or hoping)
There was acceptable agreement between test-retest values of the subscales of the Igbo-CSQ as mean differences were close to zero and most points were within the 95% limits of agreement of the mean differences (Figures 4.13 to 4.19).
Table 4.15: Spearman’s correlation between Igbo-CSQ subscales and pain intensity

<table>
<thead>
<tr>
<th>Igbo-CSQ subscale</th>
<th>Igbo-BS-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Igbo-CSQ diverting attention</td>
<td>0.3**</td>
</tr>
<tr>
<td>Igbo-CSQ reinterpreting pain sensation</td>
<td>0.3**</td>
</tr>
<tr>
<td>Igbo-CSQ catastrophising</td>
<td>0.5**</td>
</tr>
<tr>
<td>Igbo-CSQ ignoring pain sensations</td>
<td>0.2*</td>
</tr>
<tr>
<td>Igbo-CSQ praying or hoping</td>
<td>0.3**</td>
</tr>
<tr>
<td>Igbo-CSQ coping self-statements</td>
<td>0.3**</td>
</tr>
<tr>
<td>Igbo-CSQ increased behavioural activities</td>
<td>0.2**</td>
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<tr>
<td>Igbo-CSQ item pain control</td>
<td>-0.03</td>
</tr>
<tr>
<td>Igbo-CSQ item pain decrease</td>
<td>-0.03</td>
</tr>
</tbody>
</table>

**p<0.01; *p<0.05

Most Igbo-CSQ subscales correlated at least moderately ($r_s \approx 0.3$) with pain intensity (Igbo-BS-11) except ignoring pain sensations and increased behavioural activities subscales ($r_s \approx 0.2$). Igbo-CSQ pain self-efficacy items (pain control and pain decrease) had negative correlations with pain intensity which were not significant. Notably, catastrophising subscale had the strongest positive correlation with pain intensity (Table 4.15).
Table 4.16: Exploratory factor analysis of the Igbo-CSQ

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<td>.339</td>
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</tbody>
</table>

KMO= 0.93
\(\chi^2=5499.07***\)

Only factor loadings above 0.3 are shown; KMO= Kaiser-Meyer-Olkin measure of sampling adequacy; \(\chi^2\)= Bartlett’s test of sphericity tested with chi-square ***p<0.001; Extraction Method: Principal Axis Factoring; Rotation Method: Promax with Kaiser Normalization; Rotation converged in 7 iterations.

A seven-factor solution of the Igbo-CSQ was produced. 44.64% of the items had factor loadings above 0.5. Factor 1 had main loadings from 4 items of the original
reinterpreting pain sensations subscale, 4 items of the original ignoring sensations subscale, 2 items of the original increased behavioural activities subscale, 1 item of the original diverting attention subscale. Factor 2 was loaded mainly by all items of the original praying or hoping subscale, and 4 out of 6 items of the original coping self-statements subscale. Factor 3 had main loadings from 5 out of 6 items of the original diverting attention subscale, and 3 out of 6 items of the original increased behavioural activities subscale. Factor 4 was loaded mainly by all items of the original catastrophising subscale only. Factor 5 was loaded by only 3 items with each item of the original ignoring sensations, coping self-statements and increased behavioural activities subscales. Factor 6 was loaded by 2 items of the original reinterpreting pain sensations subscale, 1 item of the original catastrophising subscale, and one item of the original coping self-statements subscale. Factor 7 was loaded mainly by 1 item of the original ignoring sensations subscale. The catastrophising factor was the only one that retained the structure (100%) of the original measure. Praying and hoping combined with coping self-statements appeared to be one distinct coping strategy as opposed to two strategies in the original measure (Table 4.16).

4.4.2.8 Igbo-MSPSS

Table 4.17: Reliability of Igbo-MSPSS

<table>
<thead>
<tr>
<th>Number of items: 12; Cronbach’s alpha global score: 0.88; ICC (95% CI): 0.82 (0.68, 0.90)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach’s alpha If Item Deleted</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>0.87</td>
</tr>
<tr>
<td>9</td>
</tr>
<tr>
<td>0.87</td>
</tr>
</tbody>
</table>

SEM: 5.90  MDC: 16.34

Internal consistency was excellent ($\alpha \approx 0.9$) and intraclass correlation coefficient was very good ($ICC = 0.88$) for Igbo-MSPSS. Standard error of measurement and minimal detectable change were 5.90 and 16.34 respectively (Table 4.17).
Figure 4.20: Bland-Altman plot for test-retest agreement of Igbo-MSPSS

Acceptable agreement was observed between test-retest values of the Igbo-MSPSS as mean difference was close to zero and most points were within the 95% limits of agreement of the mean difference (Figure 4.20).

Table 4.18: Spearman’s correlation between Igbo-MSPSS and pain intensity

<table>
<thead>
<tr>
<th></th>
<th>Igbo-BS-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Igbo-MSPSS</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Igbo-MSPSS had no correlation (r=0) with pain intensity (Igbo-BS-11) (Table 4.18).
Table 4.19: Exploratory factor analysis of the Igbo-MSPSS

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSPSS6</td>
<td>.844</td>
<td>.827</td>
<td></td>
</tr>
<tr>
<td>MSPSS9</td>
<td>.788</td>
<td>.901</td>
<td>.748</td>
</tr>
<tr>
<td>MSPSS7</td>
<td>.767</td>
<td>.775</td>
<td>.744</td>
</tr>
<tr>
<td>MSPSS12</td>
<td>.741</td>
<td>.624</td>
<td></td>
</tr>
<tr>
<td>MSPSS2</td>
<td></td>
<td>.921</td>
<td></td>
</tr>
<tr>
<td>MSPSS1</td>
<td></td>
<td>.901</td>
<td></td>
</tr>
<tr>
<td>MSPSS10</td>
<td></td>
<td>.748</td>
<td></td>
</tr>
<tr>
<td>MSPSS5</td>
<td></td>
<td>.624</td>
<td></td>
</tr>
<tr>
<td>MSPSS8</td>
<td></td>
<td></td>
<td>.827</td>
</tr>
<tr>
<td>MSPSS4</td>
<td></td>
<td></td>
<td>.775</td>
</tr>
<tr>
<td>MSPSS11</td>
<td></td>
<td></td>
<td>.744</td>
</tr>
<tr>
<td>MSPSS3</td>
<td></td>
<td></td>
<td>.701</td>
</tr>
</tbody>
</table>

KMO= 0.88
χ²= 1415.25***

Only factor loadings above 0.3 are shown; KMO= Kaiser-Meyer-Olkin measure of sampling adequacy; χ² = Bartlett’s test of sphericity tested with chi-square ***p<0.001; Extraction Method: Principal Axis Factoring; Rotation Method: Promax with Kaiser Normalization; Rotation converged in 5 iterations.

A three-factor solution of the Igbo-MSPSS was produced exactly (100%) as in the original measure. Factors 1, 2 and 3 corresponded to the original friends, significant other and family subscales respectively. 100% of the items had factor loadings above 0.5 (Table 4.19).
### 4.4.2.9 Igbo-ORFQ

**Table 4.20: Reliability of Igbo-ORFQ**

Cronbach’s alpha total score: 0.84  
ICC: 0.83  

<table>
<thead>
<tr>
<th>Items</th>
<th>Unweighted K</th>
<th>SE</th>
<th>Linear weighted K</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.65**</td>
<td>0.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0.34*</td>
<td>0.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0.34*</td>
<td>0.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0.41*</td>
<td>0.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>0.54**</td>
<td>0.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>0.52**</td>
<td>0.14</td>
<td>0.52</td>
<td>0.09</td>
</tr>
<tr>
<td>7</td>
<td>0.65**</td>
<td>0.14</td>
<td>0.56</td>
<td>0.10</td>
</tr>
<tr>
<td>8</td>
<td>0.56**</td>
<td>0.13</td>
<td>0.51</td>
<td>0.09</td>
</tr>
<tr>
<td>9</td>
<td>0.55**</td>
<td>0.15</td>
<td>0.52</td>
<td>0.10</td>
</tr>
<tr>
<td>10</td>
<td>0.81**</td>
<td>0.11</td>
<td>0.49</td>
<td>0.10</td>
</tr>
<tr>
<td>11</td>
<td>0.50**</td>
<td>0.15</td>
<td>0.59</td>
<td>0.09</td>
</tr>
<tr>
<td>12</td>
<td>0.58**</td>
<td>0.14</td>
<td>0.57</td>
<td>0.09</td>
</tr>
<tr>
<td>13</td>
<td>0.43*</td>
<td>0.16</td>
<td>0.50</td>
<td>0.10</td>
</tr>
<tr>
<td>14</td>
<td>0.42*</td>
<td>0.15</td>
<td>0.32</td>
<td>0.09</td>
</tr>
<tr>
<td>15</td>
<td>0.41*</td>
<td>0.17</td>
<td>0.49</td>
<td>0.10</td>
</tr>
<tr>
<td>16</td>
<td>0.57**</td>
<td>0.11</td>
<td>0.47</td>
<td>0.08</td>
</tr>
<tr>
<td>17</td>
<td>0.50**</td>
<td>0.15</td>
<td>0.34</td>
<td>0.11</td>
</tr>
<tr>
<td>18</td>
<td>0.46*</td>
<td>0.23</td>
<td>0.46</td>
<td>0.11</td>
</tr>
<tr>
<td>19</td>
<td>0.23∞</td>
<td>0.23</td>
<td>0.37</td>
<td>0.13</td>
</tr>
<tr>
<td>20</td>
<td>0.64**</td>
<td>0.19</td>
<td>0.42</td>
<td>0.09</td>
</tr>
<tr>
<td>21</td>
<td>0.38*</td>
<td>0.27</td>
<td>0.35</td>
<td>0.11</td>
</tr>
<tr>
<td>22</td>
<td>0.38*</td>
<td>0.27</td>
<td>0.36</td>
<td>0.14</td>
</tr>
<tr>
<td>23</td>
<td>0.60**</td>
<td>0.15</td>
<td>0.45</td>
<td>0.10</td>
</tr>
<tr>
<td>24</td>
<td>0.25∞</td>
<td>0.19</td>
<td>0.36</td>
<td>0.09</td>
</tr>
<tr>
<td>25</td>
<td>0.56**</td>
<td>0.20</td>
<td>0.54</td>
<td>0.10</td>
</tr>
</tbody>
</table>

**Total scoring**

Median (IQR) test: 2.00 (1, 5)  
Median (IQR) retest: 2.00 (1, 5)

**Significant at p<0.0005; *Significant at p<0.05; K= kappa statistic; SE= standard error; ∞= adapted total scoring not in the original measure; ∞∞= not significant**

Unweighted and linear weighted Kappa were fair to almost perfect for all items except items 19 (K=0.23, p>0.05) and 24 (K=0.25, p>0.05). Internal consistency (α = 0.84) and intraclass correlation coefficient (ICC = 0.83) were good for Igbo-ORFQ. Median test-retest scores for adapted total scoring of Igbo-ORFQ were exactly the same (Table 4.20).
4.4.2.10  Igbo-BIPQ

Table 4.21: Reliability of Igbo-BIPQ

<table>
<thead>
<tr>
<th>Number of items: 8; Cronbach’s alpha global score: 0.76; ICC (95% CI): 0.78 (0.62, 0.88)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach’s alpha If Item Deleted</td>
</tr>
<tr>
<td>1  2  3  4  5  6  7  8</td>
</tr>
<tr>
<td>0.69  0.81  0.78  0.73  0.71  0.71  0.73  0.69</td>
</tr>
<tr>
<td>SEM: 5.44  MDC: 15.08</td>
</tr>
</tbody>
</table>

Internal consistency (α = 0.76) and intraclass correlation coefficient (ICC = 0.78) were good for Igbo-BIPQ. Standard error of measurement and minimal detectable change were 5.44 and 15.08 respectively (Table 4.21).

Figure 4.21: Bland-Altman plot for test-retest agreement of Igbo-BIPQ

Agreement was acceptable between test-retest values of the Igbo-BIPQ as mean difference was close to zero and most points were within the 95% limits of agreement of the mean difference (Figure 4.21).
Table 4.22: Pearson’s correlation between Igbo-BIPQ and pain intensity

<table>
<thead>
<tr>
<th></th>
<th>Igbo-BS-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Igbo-BIPQ</td>
<td>0.41**</td>
</tr>
</tbody>
</table>

**p<0.01

Igbo-BIPQ had a moderate correlation (r=0.41) with pain intensity (Igbo-BS-11) (Table 4.22).

4.4.2.11 Igbo-FABQ

Table 4.23: Reliability of Igbo-FABQ

<table>
<thead>
<tr>
<th>Igbo-FABQ total score</th>
<th>Number of items: 11; Cronbach’s alpha global score: 0.86; ICC (95% CI): 0.72 (0.51, 0.84)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach’s alpha If Item Deleted</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>0.86</td>
<td>0.85</td>
</tr>
<tr>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>SEM: 7.40</td>
<td>MDC: 20.51</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Igbo-FABQ (physical activity)</th>
<th>Number of items: 4; Cronbach’s alpha global score: 0.81; ICC (95% CI): 0.71 (0.47, 0.84)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach’s alpha If Item Deleted</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>0.78</td>
<td>0.74</td>
</tr>
<tr>
<td>SEM: 3.21</td>
<td>MDC: 8.90</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Igbo-FABQ (work)</th>
<th>Number of items: 7; Cronbach’s alpha global score: 0.80; ICC (95% CI): 0.72 (0.51, 0.84)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cronbach’s alpha If Item Deleted</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>0.75</td>
<td>0.76</td>
</tr>
<tr>
<td>SEM: 5.30</td>
<td>MDC: 14.69</td>
</tr>
</tbody>
</table>

Internal consistency was excellent (α = 0.86) for total scoring of Igbo-FABQ; good for physical activity (α = 0.81) and work (α = 0.80) subscales, and no item deletion increased internal consistency. Good intra class correlation coefficients were observed for total scoring (ICC = 0.72), physical activity (ICC = 0.71), and work (ICC = 0.72) subscales. Standard error of measurement and minimal detectable change were 7.40 and 20.51 for total scoring; 3.21 and 8.90 for the physical activity subscale; and 5.30 and 14.69 for work subscale (Table 4.23).
Figure 4.22: Bland-Altman plot for test-retest agreement of Igbo-FABQ (total)

Figure 4.23: Bland-Altman plot for test-retest agreement of Igbo-FABQ (physical activity)
Figure 4.24: Bland-Altman plot for test-retest agreement of Igbo-FABQ (work)

Agreement was acceptable between test-retest values of the Igbo-FABQ total score and its subscales as mean differences were close to zero, and most points were within the 95% limits of agreement of the mean differences (Figures 4.22 to 4.24).

Table 4.24: Spearman’s correlation between Igbo-FABQ and pain intensity

<table>
<thead>
<tr>
<th>Igbo-FABQ</th>
<th>Igbo-BS-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Igbo-FABQ (total)</td>
<td>0.36**</td>
</tr>
<tr>
<td>Igbo-FABQ (physical activity)</td>
<td>0.28**</td>
</tr>
<tr>
<td>Igbo-FABQ (work)</td>
<td>0.37**</td>
</tr>
</tbody>
</table>

**p<0.01

Igbo-FABQ and its subscales correlated moderately with pain intensity (Igbo-BS-11) (Table 4.24).
Table 4.25: Exploratory factor analysis of the Igbo-FABQ

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>FABQ9</td>
<td>.903</td>
<td></td>
</tr>
<tr>
<td>FABQ6</td>
<td>.759</td>
<td></td>
</tr>
<tr>
<td>FABQ11</td>
<td>.727</td>
<td></td>
</tr>
<tr>
<td>FABQ7</td>
<td>.709</td>
<td></td>
</tr>
<tr>
<td>FABQ10</td>
<td>.687</td>
<td></td>
</tr>
<tr>
<td>FABQ2</td>
<td>.452</td>
<td>.404</td>
</tr>
<tr>
<td>FABQ3</td>
<td>.421</td>
<td>.354</td>
</tr>
<tr>
<td>FABQ5</td>
<td></td>
<td>1.004</td>
</tr>
<tr>
<td>FABQ4</td>
<td></td>
<td>.876</td>
</tr>
<tr>
<td>FABQ12</td>
<td></td>
<td>.562</td>
</tr>
<tr>
<td>FABQ15</td>
<td></td>
<td>.459</td>
</tr>
</tbody>
</table>

KMO= 0.91

$\chi^2= 1338.99^{***}$

Only factor loadings above 0.3 are shown; KMO= Kaiser-Meyer-Olkin measure of sampling adequacy; $\chi^2= $ Bartlett’s test of sphericity tested with chi-square $^{***}p<0.001$; Extraction Method: Principal Axis Factoring; Rotation Method: Promax with Kaiser Normalization; Rotation converged in 3 iterations.

A two-factor solution of the Igbo-FABQ was produced. 72.73% of the items had factor loadings above 0.5. 63.64% of the items loaded on their corresponding factor in the original measure: 71.43% for work subscale; 50.00% for physical activity subscale. Factor 1 had all but two items (12, 15) of the original work subscale loading on it, with additional two items of the original physical activity subscale (2, 3) loading on it. Factor 2 had two of the four items (4, 5) of the original physical activity subscale, and two items (12, 15) of the original work subscale loading on it (Table 4.25).

4.5 Discussion

Notable in the cross-cultural adaptation was the lack of Igbo equivalents of some English words. This was resolved by using Igbo phrases that retained the conceptual meaning in the original items. This is not surprising as Igbo was only a spoken language until fairly recently (583-588), and may be more adapted to colloquial speech than academic writing. English is the official written language of instruction in Nigeria, and may explain why literate Nigerians preferred to read/write English and speak Igbo (376). Some Igbo words/phrases had multiple meanings depending on the context, and may be due to limited Igbo vocabulary (584). This was resolved by using Igbo phrases with all possible meanings reflecting the original items. Some Igbo terms are borrowed from English (589), and may explain why Igbo is often spoken including English words (376).
cross-cultural adaptation confirmed the face and content validity of all Igbo measures. Although the factor structures of the adapted measures with subscales were close to the original measures, only the Igbo-MSPSS and catastrophising subscale of the Igbo-CSQ were reproduced exactly as in the original measure. Differences could be due to small sample sizes, and high illiteracy resulting in high measurement error. Another reason could be different population characteristics. This warrants that more research is conducted to confirm the factor structures of the Igbo measures.

4.5.1 Igbo-RMDQ

Cross-cultural adaptation

RMDQ was easy to translate, culturally adapt, comprehend and was generally acceptable in this population, similar to other adaptations (556, 565, 590-600). LBP was generally understood as ‘waist pain’ possibly due to limited Igbo adjectives (584), and the Igbo cultural connotation of the ‘waist’, understood as the body part that does important human movements/activities, believed to be hampered by CLBP (376). LBP was regarded as ‘waist pain’ in other rural African contexts such as rural Botswana (229).

Internal consistency

Internal consistency (α= 0.84) of Igbo-RMDQ corresponds with the 0.84-0.93 of the original English measure (518), similar in other languages (556, 590-592, 595, 598-601).

Test-retest reliability

Igbo-RMDQ is reliable, evidenced by high ICC (0.80); and Bland-Altman plots suggesting agreement which concurs with the original measure (496, 518), and other adaptations (556, 565, 590-593, 597, 598, 600, 601).

Standard error of measurement and minimal detectable change

Minimal detectable change (MDC: 7.00) and Bland-Altman limits of agreement of Igbo-RMDQ (-8.58 to 9.54) are greater than 4-5 reported in Norwegian and Arabic translations (556, 557), 5 points minimal clinically important difference (MCID) (602, 603), and the
30% MCID criteria (604). SEM and MDC of the original RMDQ has been reported as 1.79 and 5 respectively (605). The SEM (2.53) of Igbo-RMDQ is below its reported MCID.

MCID combines both anchor-based methods (patients’ rating of improvement) and distribution-based method (based on the SEM), and has not been determined in this population. MDC should be sufficiently small to detect MCID (560). However, MDC solely determined using distribution-based methods may lead to patients with actual improvement being rated as not improved (604), as measurement error is not constant across scores and populations (605). The Igbo-RMDQ has an SEM (2.53) that is smaller than the agreement limits and MCID of the RMDQ, as change within measurement error, believed to be real by patients, likely reflect true change (604).

**Construct validity**

Igbo-RMDQ had moderate positive correlations with performance-based disability and pain intensity confirming that it is a measure of pain-related disability (557, 564, 565). The moderate correlation with performance-based disability concurs with the literature suggesting that self-reported and performance-based disability are related but distinct constructs (566, 567, 606).

**4.5.2 Igbo-WHODAS**

**Cross-cultural adaptation**

WHODAS 2.0 was straightforward to cross-culturally adapt, comprehend and was acceptable, as suggested by previous adaptations (607-612). Although Igbo is a ‘verb language’ (586), there was no Igbo equivalent for ‘analyse’ in item D1.3 which was resolved by using Igbo words ‘probing/exploring/researching’ to maintain conceptual meaning. The lack of an Igbo word for ‘emotion’ in item D6.5 may reflect the unclear emotional concept in Igbo culture (376), common in other non-western settings (124, 125). ‘Affected your heart or spirit’ was therefore used to achieve conceptual equivalence.
Internal consistency

Cronbach’s alpha of Igbo-WHODAS and its subscales ranging between 0.75-0.97 concurs with the original measure (52), and agrees with other adaptations (607, 609, 611). However, the Cronbach’s alpha was slightly higher in the original measure possibly due to different population characteristics including literacy rates.

Test-retest reliability

Igbo-WHODAS and its subscales demonstrated reliability with ICCs that were very good to excellent (0.81-0.93). The good agreement shown in the Bland-Altman plots mirrors the original measure (52), and other adaptations (609, 611).

Standard error of measurement and minimal detectable change

19% (Japan) to 51% (Nigeria) reduction in WHODAS is clinically important (52). This corresponds to between 4.8 and 12.97 of Igbo-WHODAS mean of 25.44. Therefore, SEM of 5.05, MDC of 13.99 and limits of agreement of -8.58 to 9.54 of Igbo-WHODAS may be appropriate.

Construct validity

Igbo-WHODAS and most subscales correlated moderately with performance-based disability except the cognition subscale that had a low correlation. This agrees with the literature (52, 53, 613). The mobility subscale had one of the strongest correlations with BPS as expected because BPS measures mobility-related disability in people with LBP (542).

Factor structure

A seven-factor solution of the Igbo-WHODAS was produced similar to adaptations in European languages (609) and Chinese (611); in contrast to the six factors in the original measure (52). Most Igbo-WHODAS items loaded on their corresponding factor in the original measure except for participation. Participation was the least precise with only two of the original eight items (‘drain on financial resources’ and ‘problem to family’) that loaded on it. The other items in the original participation subscale loaded on all other factors except self-care.
4.5.3 Igbo-BS-11

Cross-cultural adaptation

Igbo BS-11 was acceptable and the extreme anchors (0 and 10) corresponded to the anchors of the Igbo VAS (507). The additional anchors at two, four, six and eight enhanced comprehensibility in rural Nigeria.

Test-retest reliability

Igbo-BS-11 was reliable with high ICC (0.71) and consistent Bland-Altman plot. Intra-class correlation coefficient was not excellent perhaps due to the variable nature of pain intensity in this population (376).

Standard error of measurement and minimal detectable change

MDC of 3.28 and limits of agreement of -4.70 and 3.30 of Igbo-BS-11 are larger than the reported MCID of -2.0 (614, 615). However, the SEM (1.18) of Igbo-BS-11 is lower than its reported MCID suggesting some clinical usefulness.

Construct validity

The validity of the Igbo-BS-11 is suggested by the moderate positive correlation between the measure and BPS, which measures LBP related mobility limitation (542). This concurs with the literature (568, 569).

4.5.4 Igbo-HADS

Cross-cultural adaptation

HADS was difficult to cross-culturally adapt possibly due to items having idioms and colloquialisms that may be culture specific (616), and the unclear concept of anxiety and depression in Igbo culture (376). Cultural equivalence was therefore achieved by involving an Igbo clinical psychologist familiar with the idioms and colloquialisms commonly used by patients in this culture. All items except A3, A11, D2 and D6 underwent a repeat cross-cultural adaptation in order to achieve conceptual
equivalence. Subsequent pre-testing among people with CLBP improved and confirmed comprehensibility and acceptability.

**Internal consistency**

Anxiety and depression subscales of Igbo-HADS had internal consistencies ($\alpha = 0.78; \alpha = 0.67$) which were in perfect agreement with the original measure (497). Lower internal consistency of the depression subscale, consistently found in other studies (617, 618), could be because depression may be a less basic and physiological emotional state than anxiety. Exclusion of somatic symptoms from the HADS, may further influence consistency in non-western settings where emotional states are often expressed through somatisation (124, 125, 376). Moreover, somatic symptoms may be more related to anxiety than depression (619).

**Test-retest reliability**

Good reliability of the Igbo-HADS ($ICC = 0.8$) was demonstrated which agrees with the original measure (497), and adapted versions (620). Bland-Altman plots showed good agreement between test-retest values.

**Standard error of measurement and minimal detectable change**

SEM of 1.82 and 2.25, MDC of 5.06 and 6.23, and limits of agreement of -7.68 to -8.70, and 5.56 to 7.10 of depression and anxiety subscales of Igbo-HADS, all exceed MCID of between 1.32 and 1.68 reported in the literature (525).

**Construct validity**

The moderate correlation between anxiety and depression subscales of Igbo-HADS with pain intensity concurs with the literature (139, 575, 576).

**Factor structure**

A two-factor solution of the Igbo-HADS was produced as in the original measure (497) and another adaptation (620). In contrast, three factors were found in other adaptations (621, 622). The factor corresponding to anxiety was more consistent with the original measure than depression probably because somatisation, commonly used to express emotional state in non-western settings (124, 125, 376), may be more related to anxiety than depression (619).
4.5.5 Igbo-CSQ

Cross-cultural adaptation

Only minor issues were encountered in the cross-cultural adaptation of the CSQ which concurs with other studies (561, 623, 624), and may be related to Igbo grammatical characteristics (583-589). Some English words/phrases lacked exact Igbo alternatives, therefore Igbo expressions reflecting the original meanings were used for items 1, 12, 29 and 42. No problems were encountered in the control and ability to decrease pain items. Comprehensibility and acceptability was subsequently confirmed in people living with CLBP. However, they reported not doing most of the items in the measure.

Internal consistency

All but one subscale of Igbo-CSQ had Cronbach’s alpha ranging from 0.73 to 0.86 concurring with the original measure (197), and other adaptations (623, 625). Ignoring pain sensations had the least value of 0.66. Praying and hoping (0.86) and catastrophising (0.85) had the highest scores, suggesting that these coping strategies may be more consistent in this population than ignoring pain sensations, in line with previous qualitative findings in this population (376). In contrast, ignoring pain sensations may be more popular than praying and hoping in western settings (623, 625).

Test-retest reliability

All subscales of the Igbo-CSQ were reliable with ICCs ranging between 0.77 and 0.91, similar to many studies (502, 561, 623). Bland-Altman plots showed good agreement.

Standard error of measurement and minimal detectable change

To the researcher’s knowledge, MCID has not been determined for the CSQ, hence there are no reference points with which to compare the Igbo-CSQ. However, rather than being a fixed number, MCID is context-specific (626).

Construct validity

Igbo-CSQ catastrophising subscale had the strongest positive correlation with pain intensity, in line with the literature (154, 163, 166). Most other subscales had low to moderate correlations with pain intensity as expected (186). Ignoring pain sensations
and coping self-statements which are often adaptive and not associated with pain intensity in previous studies (186, 577), were significantly and positively correlated with pain intensity in this population. Notably, no coping strategy (Igbo-CSQ subscales) appeared adaptive in this population as they were all positively correlated with pain intensity. The two pain self-efficacy items (pain control and pain decrease) were negatively correlated with pain intensity as expected (184). However, these correlations were not statistically significant. This suggests that no coping strategy had been effective in reducing pain in this population.

**Factor structure**

A seven-factor solution of the Igbo-CSQ was produced like the original measure (197). In contrast to the original measure, items in the factors were different. Catastrophising subscale was the only factor reproduced as in the original measure, suggesting this is a distinct strategy in this population. Praying/hoping and coping self-statements appeared to be one distinct strategy in this population. The remaining four coping strategies did not appear to be defined in this population. Other adaptations of the CSQ have also reported factor loadings different from the original measure (561, 625), suggesting that coping strategies may differ in different contexts.

**4.5.6 Igbo-MSPSS**

**Cross-cultural adaptation**

MSPSS was very easy to cross-culturally adapt, and was found acceptable and comprehensible supporting previous studies (627-631). ‘Sorrow’ and ‘mourning’ are Igbo homographs and both reflected the original item 2.

**Internal consistency**

Cronbach’s alpha of 0.88 of Igbo-MSPSS corresponds exactly to the original English version (498, 529), similar in other cultures (627-631).
Test-retest reliability

Igbo-MSPSS is reliable as the original measure (498) and other translations (627-631). It had high ICC (0.82). Bland-Altman plots showed good agreement.

Standard error of measurement and minimal detectable change

To the researcher’s knowledge, there is no MCID with which to compare the SEM and MDC of the Igbo-MSPSS. However, this value may likely be context-specific.

Construct validity

The lack of correlation of Igbo-MSPSS with pain intensity concurs with the literature (578, 579).

Factor structure

The exact three-factor solution of the original MSPSS (498) was reproduced in the Igbo-MSPSS, similar to other adaptations (627, 630, 631). In contrast, a one factor structure was observed in Pakistan (629), and a two factor structure in Hong Kong (628).

4.5.7 Igbo ORFQ

Cross-cultural adaptation

No cross-cultural adaptation of the ORFQ exists to the researcher’s knowledge. Studies in non-western countries have either used the original measure (541, 632), or developed new measures based on the content of the ORFQ (633). The difficulty in its cultural adaptation for rural Nigeria was related to the use of technical words such as ‘percentage’, ‘degrees’ and ‘pounds’ which did not have Igbo equivalents. Cross-cultural adaptation therefore involved concretisation of these words which enhanced understanding and acceptability while retaining conceptual equivalence.
**Internal consistency**

High internal consistency ($\alpha = 0.84$) was observed for Igbo-ORFQ. Although the original ORFQ did not assess internal consistency and no study has reported it, the Cronbach’s alpha of Igbo-ORFQ mirrored a similar measure of biomechanical exposure (634).

**Test-retest reliability**

Igbo-ORFQ has good reliability with high ICC (0.83), similar to the original measure (500). Unweighted and linear weighted kappa showed agreement for most items. In contrast to the original measure, items 19 (operating powered hand tools) and 24 (lifting 10-30 pounds’ objects), did not show agreement, suggesting these activities were not consistently performed in this population.

### 4.5.8 Igbo-BIPQ

**Cross-cultural adaptation**

Cross-cultural adaptation of the BIPQ was straightforward, in agreement with other cultures (562, 635). Minor issues were related to ‘how’ and ‘how much’ being Igbo homographs depending on the context. Therefore, ‘to what extent’ was used in place of ‘how much’ to retain conceptual equivalence. Similar to the WHODAS, ‘affect your heart/spirit’ was used to echo the emotional concept in item 8 due to its unclear representation in this context (376). The fact that many participants understood ‘symptoms’ but not its Igbo equivalent in item 5, reflects the dependence of Igbo grammar on English vocabulary (589). Problems with quantifying symptoms in item 5 have been observed in the Netherlands (636).

**Internal consistency**

Less than excellent internal consistency ($\alpha = 0.76$) of Igbo-BIPQ agrees with other studies (535, 637, 638), and could be because each item assesses a different dimension of illness perceptions (499, 636). This could limit the extent of inter-item correlations. However, this was not evaluated in the original measure (499).
Test-retest reliability

Igbo-BIPQ is reliable with high ICC (0.78); and Bland-Altman plots showing good agreement. Findings concur with the original measure (499), and other adaptations (535, 562).

Standard error of measurement and minimal detectable change

To the researcher’s knowledge, MCID has not been determined for the BIPQ, and hence could not be compared with the SEM and MDC of the Igbo-BIPQ.

Construct validity

The moderate correlation between Igbo-BIPQ and pain intensity concurs with the literature (164, 173, 178).

4.5.9 Igbo-FABQ

Cross-cultural adaptation

The cross-cultural adaptation, comprehensibility and acceptability of the FABQ was very good, similar to other studies (536, 537, 639-642). Item 8, ‘I have a claim for compensation for my pain’ which was skewed in a German population because most participants ‘completely did not agree’ with it (643), generated similar responses in this population. This is because Nigeria lacked social benefits. The item was adapted to capture this reality. The Igbo phrase for ‘physical activity’ could also mean ‘being active’, ‘moving the body’ or ‘moving about’, all of which are in line with the fear avoidance model (69, 134, 147, 148).

Internal consistency

A range of Cronbach’s alpha between 0.80 and 0.86 of Igbo-FABQ and its subscales are in line with both the original measure (149), and other translations (537, 639, 642, 643).
**Test-retest reliability**

Good reliability observed for Igbo-FABQ with ICCs ranging from 0.71 to 0.72, and Bland-Altman plots that suggested good agreement, are in line with the literature (149, 537, 639, 642, 643).

**Standard error of measurement and minimal detectable change**

SEM of 3.21, MDC of 8.90, and limits of agreement of between -13.00 and 8.48 of Igbo-FABQ (physical activity subscale) are all within the reported MCID of 13 for the physical activity subscale of the FABQ (539), suggesting good clinical utility.

**Construct validity**

The moderate correlations between Igbo-FABQ, its subscales, and pain intensity support the literature (69, 147, 539, 570, 572-574, 642).

**Factor structure**

A two-factor structure of the Igbo-FABQ was produced similar to the original measure (149) and Norwegian adaptation (639). However, the physical activity factor was not precise as half of the items also loaded on the work subscale, in contrast to findings in a German population (643).

**4.5.10 Strengths and limitations**

This study enabled the development of valid and reliable measures for Igbo speaking populations including illiterate people. The measures may be especially useful for rural Nigerians often neglected clinically and during research despite being the most vulnerable group. This is possibly due to the difficulty in the interviewer-administration of self-report measures. The demonstrated complexity of developing valid and reliable measures for this population could be related to cultural, linguistic and literacy issues.

Despite acceptable validity and reliability levels, high sample variability and measurement errors were probably introduced by low literacy rates, interviewer-administration in place of self-administration, and data collection by several raters. This
is important considering that MDC not only depends on the inherent measurement error of an instrument, but varies across populations and contexts (604, 644). In view of this, sensitivity-to-change studies of the Igbo measures are required in populations of varying literacy levels, with single raters, and using more rigorous analysis such as receiver operating characteristic (ROC) curves, which includes patients’ own global impression of change (645). Furthermore, these studies need to confirm the MDCs, and determine the proportion of people that achieve the MDCs of the Igbo measures.

Due to lack of existing Igbo measures, a large number of measures had to be adapted for this thesis. Consequently, there was lack of bilingual assessment of the agreement between the original English and Igbo measures, including item by item agreement. Future bilingual testing incorporating item by item agreement, in a population with adequate literacy levels to enable comprehension of English and Igbo is therefore necessary.

As cross-cultural adaptation ensures the cultural fit of an instrument beyond simple translation, another limitation of this study is the preservation of the original factor structures of the English measures, even for measures showing different factor structures in rural Nigeria, and lack of rigorous investigation of item redundancy. This is particularly important for the CSQ which had different factor structures, and items in the cognitive coping strategies including the ignoring pain sensations, diverting attention, and reinterpreting pain sensation subscales that were not commonly adopted for coping in this population. Redundancy could be demonstrated in terms of items that are too similar which spuriously inflate reliability (646, 647), or items that are not applicable in a particular culture or population (648, 649).

Acceptable internal consistencies of the Igbo measures suggest that items were sufficiently independent but as similar as possible. However, Principal Components Analysis (PCA), a data reduction technique which identifies and discards highly correlated items in a measure may have further improved construct validity of the measures (650, 651) but was not done in this study. Importantly, PCA is a large sample evaluation requiring at least five times the number of items in a questionnaire being analysed (652). A much larger sample size may even be required when only a few items are expected to load onto each component, and when variable communalities
(percentage of variance in an observed variable that is accounted for by the retained components) are low (652).

The lack of systematic examination of redundancy in terms of item relevance in rural Nigeria could have distorted content validity (648), inflated measurement errors, and limited meaningful information obtained from the measures (649). Reducing redundancy involves excluding items that are not applicable in a population following assessment by a team of content experts from each culture in a population (648, 649). Items rated by a single team member as irrelevant, or by two or more members as questionably relevant should be eliminated, whereas items obtaining one rating of questionable relevance should be reconsidered for inclusion (648). Re-assessment of internal consistency would then be needed when any item is removed from a measure to ensure that an acceptable Cronbach’s alpha (>0.60) is maintained (648).

Following the elimination of redundancy, multi-group confirmatory factor analyses may be needed to compare and determine the factor structures with the best fit indices in rural Nigeria (649), assess if the same items assess the same construct in different populations in rural Nigeria, whether the items of a given factor are equally significant within different cultures in rural Nigeria or are too different; and if items are more biased towards some cultural groups than others (646). Using item response theory, items with different functioning may be eliminated so that groups are comparable, in which case the measure becomes somewhat different from the original, or considered differently in separate groups to maintain equivalence between scores (646). However, confirmatory factor analyses would require a sample size of at least 300 when there are only a few high factor loading scores (> 0.80) (547), and could not be performed in this study. This should be the focus of future research.

The validation of measures with only the BPS and pain scale due to the paucity of Igbo measures is a potential weakness. However, established correlations of Igbo measures with the BPS and pain scale, which are in line with the literature, support validity. As more validity and reliability studies are done for each Igbo measure, they can then be used to validate other measures.
4.6 Conclusions

These measures are valid and reliable for clinical and research purposes in Igbo speaking culture. They would support global health initiatives which often involve concurrent activities in countries of different languages and culture. However, the concepts of emotional distress and pain coping strategies need to be clarified in future studies in this population.

The next chapter will detail the use of these measures to derive a population based picture of CLBP disability, and determine its predictors in rural Nigeria which could not be ascertained qualitatively in the studies in Chapters two and three (Studies 1 and 2).
Biopsychosocial factors associated with self-reported and performance-based disability in rural Nigeria

5.1 Chapter summary

This chapter presents a population-based cross-sectional survey to determine the biopsychosocial factors associated with chronic low back pain (CLBP) disability in rural Nigeria. It covers a background section (5.2) which provides a brief literature review of the biopsychosocial predictors of CLBP disability, and those likely to be implicated in rural Nigeria. The methods used for sampling and recruitment, data collection and statistical analyses (section 5.3), and the results of the study (section 5.4) are then presented. The implications of findings are presented in the discussion (section 5.5).

The findings of this study suggest that psychosocial factors are the most important factors associated with CLBP disability in rural Nigeria, and accounted for 62.5% and 49.1% of the variance in self-reported and performance-based disability respectively. Illness perceptions and fear avoidance beliefs appear to be the most important psychosocial factors, as they predicted both self-reported and performance-based disability. Occupational biomechanical factors did not predict CLBP disability. These results provide some evidence to inform which factors that need to be targeted when developing an intervention to reduce CLBP disability in rural Nigeria.
5.2 Introduction

5.2.1 Background

It has been previously established in the literature review in Chapter one that biopsychosocial factors are associated with CLBP disability in western developed countries.

Psychological distress (such as anxiety, depression and somatisation) have been shown to predict functional disability (20, 79, 138, 139), but did not appear to influence work related outcomes, such as failure to return to work (140, 141). In contrast, fear avoidance beliefs are known to predict both functional and work-related outcomes (68, 69, 111, 138, 140, 150).

Catastrophising predicted persistent pain and CLBP disability (20, 152, 154, 155), and is a mediator and moderator of treatment efficacy in patients with CLBP (156). However, its exact role in CLBP is conflicting. It is regarded as a cognitive coping strategy (159, 197, 653, 654), or as part of the fear avoidance model (69, 147, 152). Other authors believe the construct is indistinguishable from negative mood, beliefs, adjustment or contextual pain factors (158, 178, 184, 193).

Coping strategies implicated in pain persistence and CLBP disability include dependence on drugs and praying/hoping (133, 182, 185). Ignoring pain sensations and coping self-statements were found to be helpful coping strategies in CLBP (186, 577). Praying/hoping, commonly regarded as unhelpful in CLBP (133, 182, 185), have also been associated with reduced pain intensity (187). Similarly, distraction and diverting attention regarded as useful coping strategies in CLBP (188), have been associated with CLBP disability elsewhere (133). This conflicting evidence suggests that the influence of coping strategies may be context-specific.

Low levels of social support at work were found to be a risk factor for first onset LBP (113), and predicted duration of sick leave (141), whereas it did not predict transition to chronicity in another systematic review (138). Pain intensity was a predictor of CLBP
disability (135), but no association was found with disability in another study that accounted for pain duration (218).

Illness perceptions have been shown to be one of the strongest predictors of CLBP disability, more important than fear avoidance beliefs, catastrophising and depression (164). They have been shown to influence clinical outcomes of treatment (173, 175).

Occupational biomechanical factors, including heavy lifting and prolonged trunk flexion, have been found to predict work-related outcomes such as duration of sick leave, earnings-related compensation, leaving jobs, and inability to carry out normal duties, but not functional disability (65, 141, 213). However, ergonomically adequate work environments may exist in the western developed countries where these research were conducted. This might explain the limited influence of biomechanical factors on functional disability. This is in contrast to rural Nigeria and other rural African contexts that lack ergonomically fit work environments (224-226).

None of the evidence of the biopsychosocial factors presented above was derived from rural African contexts. Any evidence about which biopsychosocial factors are associated with CLBP disability in rural African contexts is currently lacking. The results from the qualitative exploration of the factors associated with the experience of CLBP in Chapters two and three (Studies 1 and 2) implicated illness beliefs about CLBP, fear avoidance beliefs, catastrophic beliefs, anxiety, depression, maladaptive coping strategies, social support and occupational biomechanical factors. However, these factors were reported in the qualitative interviews, and therefore their generalisability and relative contribution to CLBP disability in rural Nigeria are unknown. Understanding the contribution of these factors could have important consequences for designing evidence-based interventions aimed at reducing CLBP disability in this population.

Evidence suggests that self-reported CLBP disability may not always reflect true functional capacity (655-657), and that predictors of self-reported and performance based disability may not always be the same (543, 544). It is therefore important to investigate both disability constructs and identify their predictors, to better understand the main factors at play in CLBP disability in this population. This chapter acknowledges the items in the guidelines for Strengthening the Reporting of Observational studies in Epidemiology (STROBE) statement (658).
5.2.2 Aims of the research

Given the dearth of evidence on the biopsychosocial factors associated with CLBP disability in rural Nigeria, this study aims to:

1. Determine the association between pain intensity, anxiety, depression, social support, illness perceptions, fear avoidance beliefs, coping strategies, occupational biomechanical factors, and self-reported and performance-based disability in adults with CLBP in a rural Nigerian population.
2. Investigate the biopsychosocial predictors of self-reported and performance-based disability in people with CLBP in the rural Nigerian population.

5.3 Methods

5.3.1 Study design

Population-based exploratory cross-sectional study.

5.3.2 Ethical considerations

Ethical approvals were obtained from King’s College London (Ref: BDM/13/14-99) and University of Nigeria Teaching Hospital (Ref: UNTH/CSA/329/Vol.5) (Appendix 13).

5.3.3 Setting

This study took place in Enugu State, one of the five states of South-eastern Nigeria, with a population of over three million people according to the 2006 Nigeria census (659). The state is made up of seventeen local government areas (LGAs), with only three exclusively urban LGAs (425). About 60% of the population lives in rural areas (425). The
rural communities are predominantly agrarian with most rural dwellers practising peasant or subsistent farming (425). This study was designed to be representative of the rural populations in Enugu State.

5.3.4 Sample size

A priori sample size calculation was performed with G power version 3.1 software (660). A sample size of 116 would give a 90% power to detect a medium regression effect size ($f^2$) of 0.15 at $\alpha$ of 0.05. Arrangement was made to recruit up to 200 participants to account for potential data loss due to incomplete or incorrect data collection.

5.3.5 Sampling and participant recruitment

Participants were the same sample that participated in the construct validity assessments of the Igbo measures (Chapter 4, section 4.3.5.1). Multistage cluster sampling was used to select rural communities, representative of rural populations in Enugu State. Stratified sampling aimed at ensuring equal representation of gender.

The seventeen LGAs in Enugu State were split into urban and rural LGAs. Enugu South, Enugu North and Enugu East are exclusively urban LGAs and were excluded from the sampling frame. Of the remaining fourteen LGAs, ten LGAs were randomly sampled with computer generated random numbers. This enabled each of the ten recruited community health workers (CHWs) to collect data from 20 participants from each LGA, making up a total of 200 participants. The CHWs were identified by the researcher’s Nigerian-based supervisor (Professor Chika Onwasigwe), and trained as explained in the study in Chapter four, section 4.3.5.2 (Study 3).

Each CHW was conveniently (familiarity with area) assigned to one of the selected ten LGAs. They collected the area maps (contained all the communities in each LGA) of the assigned LGAs from the LGA secretariats (Appendix 22), supervised by the researcher. Of these LGAs, two areas, namely - Nsukka and Oji River, had a mixture of urban and
rural communities, as advised by the staff in the LGA secretariats. Therefore, two lists comprising only the rural communities of these two LGAs were compiled from the area maps by the researcher, assisted by the assigned CHWs. The lists of the rural communities of the remaining eight exclusively rural LGAs were compiled by the researcher, assisted by the CHWs assigned to them. All these lists made up the sampling frames for the ten LGAs. Each CHW randomly selected one community from the list of communities of the assigned LGA by simple balloting, supervised by the researcher. This resulted to a total of ten rural communities from the ten LGAs (Figure 5.1).

<table>
<thead>
<tr>
<th>LGAs</th>
<th>Communities/villages</th>
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<tbody>
<tr>
<td>Aninri</td>
<td>Oduma Ameke</td>
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<tr>
<td>Nkanu East</td>
<td>Amagunze</td>
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<tr>
<td>Igboeze North</td>
<td>Umuagama</td>
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<tr>
<td>Oji river</td>
<td>Agbada Inyi</td>
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<tr>
<td>Nsukka</td>
<td>Edem Ani</td>
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<tr>
<td>Igbo etiti</td>
<td>Amagu-Uwenu</td>
</tr>
<tr>
<td>Isiuzo</td>
<td>Mgbuij Eha-Amufu</td>
</tr>
<tr>
<td>Udenu</td>
<td>Iheakpu Obollo Afor</td>
</tr>
<tr>
<td>Uzo uwani</td>
<td>Adaba Nkume</td>
</tr>
<tr>
<td>Nkanu West</td>
<td>Ukwa</td>
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</tbody>
</table>

**Figure 5.1:** Selected communities and corresponding LGAs (Local Government Areas)

The traditional head of each rural community was visited and informed about the study by the researcher. Written consent letters to carry out the study, prepared by the researcher, were then signed off by the traditional heads (Appendix 23). The traditional heads then facilitated village-wide announcements about the study and emphasized voluntary participation. Announcements informed people with CLBP, who were interested in the study, to meet on a particular day at selected community centers – such as primary health care centers or schools in each community.

Each CHW met with potential participants on the chosen day at the designated place in each rural community. The CHWs provided information sheets to the potential participants, and gave them oral explanations about the study. It was emphasized that participation in the study was entirely voluntary, and that decision to participate or not
would not affect participants in any way, and would not attract any negative consequences (information sheet – Appendix 16). Potential participants were encouraged to discuss whether they wished to participate in the study with their family and friends if they so desired. It was explained that the results of the study would be confidential and anonymised, and no one would be identified in the reports. Potential participants that indicated interest in the study were then given another appointment at the community centre.

On the second appointment, the CHWs used body charts to identify areas of pain (Appendix 8). They screened participants using questions based on a simple check list (Appendix 5) to rule out any ‘red flags’ for back pain by excluding LBP associated with underlying serious pathology, radiculopathy or spinal stenosis (32, 33). These include symptoms of cauda equina syndrome, progressive paresis, fracture, suspected tumour or local infection, ankylosing spondylitis, rheumatoid arthritis or other inflammatory diseases. This is congruent with evidence-based guidelines for diagnosing CLBP (9, 11, 12, 32). The CHWs then obtained informed consent via signature or thumb print (Appendix 17).

The eligible participants (as above), were then stratified into males and females. Random selection by balloting (without replacement) was used to ensure an equal representation of male and female participants. Overall, a sub-sample of twenty participants was selected in each of the ten communities. In each community, participants were asked to pick a folded paper slip from a pool of papers containing twenty yeses’ and the rest no’s.

5.3.6 Variables

The adapted Igbo versions of the self-report measures listed below were used for data collection (see Chapter 4). The original version of the back performance scale (542) was used as this is an objective measure of CLBP disability. All measures were administered by the CHWs.
Chronic low back pain disability

Self-reported and performance-based disability measures were utilised. Igbo-RMDQ and Igbo-WHODAS were used to assess self-reported disability. The Back Performance Scale (BPS) was utilised to assess performance-based CLBP disability.

Igbo-RMDQ is a 24-item back specific measure with each item having possible scores of 0 or 1. A total score of 24 signifies the highest possible disability level, and 0 means that there is no disability (496). Igbo-RMDQ has good psychometric properties, with good internal consistency (α=0.84), test-retest reliability (ICC=0.80), standard error of measurement (SEM=2.53), and good construct validity suggested by moderate correlations (r>0.6) with pain intensity and performance-based disability (Study 3 – Chapter 4).

Igbo-WHODAS 2.0 is a generic self-report measure of global disability. It was made back specific by replacing the word ‘health condition’ with ‘back pain’ (Chapter 4), in line with the recommendations of the original developers (52, 53). The 36-item interviewer-administered version was used with complex scoring which takes into consideration multiple levels of difficulty for each WHODAS 2.0 item. The summary score is a metric ranging from 0 signifying no disability, to 100 which means full disability (52). Igbo-WHODAS 2.0 and its subscales (as in the original measure) have good psychometric properties with acceptable internal consistency (α>0.7), test-retest reliability (ICC>0.8), standard error of measurement (SEM:5.05-11.10) and good construct validity suggested by convergent and discriminant correlations with performance-based disability (Chapter 4).

The BPS is a back-specific performance-based measure of mobility-related activities (542). Five physical performance tests involving mobility of the trunk were described by the developers as a sock test, pick-up test, roll-up test, finger-tip-to-floor test and lift test (542). Each of the five tests has scores ranging from 0 to 3 depending on the difficulty or ease with which they are performed (see Chapter 4, section 4.3.3: back performance scale). A total possible score of 15 signifies maximum disability while 0 means no disability (542). The BPS has internal consistency of 0.73, test-retest reliability of 0.91 and moderate correlations with RMDQ (r= 0.454) (542, 545, 546) (see Appendix 24 for original English measures including the BPS).
Pain intensity
This was measured by the Igbo 11-point numerical box scale (Igbo-BS-11), adapted from the original eleven-point box scale (492, 519). The Igbo-BS-11 consists of eleven numbers (0 through 10) surrounded by boxes (520). 0 represents ‘no pain’ and 10 represents ‘pain as bad as you can imagine’ or the ‘worst pain imaginable’ (492, 521, 522). Igbo-BS-11 has additional anchors of pain descriptors for response 2 (small pain), 4 (pain is not too much), 6 (severe pain) and 8 (very severe pain), which is suggested to improve clarity and validity in populations with low literacy (492, 520, 582). The Igbo-BS-11 has good test-retest reliability (ICC=0.71), standard error of measurement (SEM=2.53) and construct validity (Study 3 – Chapter 4).

Anxiety and depression
Anxiety and depression were measured by the Igbo Hospital Anxiety and Depression Scale (Igbo-HADS), which is a valid and reliable self-report measure for detecting states of anxiety (HADS-A) and depression (HADS-D). There are two subscales for anxiety and depression, with total subscale score of 0 signifying no anxiety or depression and 21 signifies the most severe anxiety or depression (497). The Igbo-HADS has good internal consistency (α = 0.78 for anxiety subscale; α = 0.67 for depression subscale); test-retest reliability (ICC≃0.8 for the two subscales), standard error of measurement (SEM: 2.25 for anxiety subscale; 1.82 for depression subscale), and construct validity using the original subscales of the measure (Study 3 – Chapter 4).

Pain coping strategies
This was assessed by the Igbo Coping Strategies Questionnaire (Igbo-CSQ), to assess cognitive and behavioural coping strategies for dealing with pain (197). Seven subscales included diverting attention, reinterpreting pain sensation, catastrophising, ignoring sensations, praying or hoping, coping self-statements and increased behavioural activities. Each subscale has a maximum score of 36 and a minimum score of 0. A higher score indicates greater use of a particular coping strategy. Additional two items assess overall effectiveness of pain control and ability to decrease pain (197). Good internal
consistencies (α: 0.66-0.86), test-retest reliability (ICC: 0.77-0.93), standard error of measurement (SEM: 2.09-3.58), and construct validity were obtained with the Igbo-CSQ using the subscales of the original measure. The catastrophising subscale was replicated as in the original measure (Study 3 – Chapter 4).

**Social Support**

Social support was measured with the Igbo multidimensional Scale of Perceived Social Support (Igbo-MSPSS), to subjectively assess social support (498). Igbo-MSPSS has twelve items which can be summed as one total score, or as three subscales (family, friends or significant other) of four items each, according to the source of social support. A total score of 12 is the minimum score, and 84 is the maximum score indicating greatest perceived social support (498). The Igbo-MSPSS has good internal consistency (α: 0.88), test-retest reliability (ICC: 0.82), standard error of measurement (SEM: 5.90) and construct validity (Study 3 – Chapter 4).

**Illness perceptions**

This was assessed with the Igbo Brief Illness Perception Questionnaire (Igbo-BIPQ), a self-report measure of illness perceptions. Eight items (consequences, timeline, personal control, treatment control, identity, illness concern, coherence and emotional representation) may be combined into one total score, or scored separately to give eight dimensions of illness perceptions (499). The maximum total score is 80 and the minimum total score is 0, with a higher score reflecting a more threatening view of an illness (499). The ninth (causal) item is open and can be categorically analysed by grouping participants’ responses into relevant categories according to the research question (499). Igbo-BIPQ has good internal consistency (α = 0.76), test-retest reliability (ICC = 0.78), standard error of measurement (SEM=5.44) and good construct validity (Study 3 – Chapter 4).
Fear Avoidance beliefs

This was assessed with the Igbo Fear Avoidance Beliefs Questionnaire (Igbo-FABQ), a 16-item back pain-specific self-report measure. The Igbo-FABQ assesses the extent to which pain is believed to be caused or aggravated by general physical activity (FABQ-PA) and work-related activities (FABQ-W), representing the original two subscales of the measure. The maximum score for FABQ-PA is 24 and the minimum is 0. The maximum score for FABQ-W is 42 and the minimum score is 0. Adding the two subscale scores gives a total FABQ score with higher scores reflecting more fear avoidance beliefs (149). Total scoring of the Igbo-FABQ and the original subscales have good internal consistency ($\alpha$: 0.80-0.86), test-retest reliability (ICC: 0.71-0.72), standard error of measurement (SEM: 3.21-7.40) and construct validity (Study 3 – Chapter 4).

Biomechanical factors

The prevailing biomechanical factors were assessed with the Igbo Occupational Risk Factor Questionnaire (Igbo-ORFQ), a 25-item self-report questionnaire that assesses biomechanical and work organisational factors associated with LBP. Igbo-ORFQ was adapted enabling a total scoring of the items measuring biomechanical factors such as bending, twisting, lifting, pulling, pushing, forceful movements and static postures like prolonged sitting, awkward postures and whole body vibrations (500). Possible scores range between 20 (maximum) and 0 (minimum), with higher scores reflecting greater reported exposure to biomechanical factors associated with LBP. The total scoring of the Igbo-ORFQ has good internal consistency ($\alpha = 0.84$) and intraclass correlation coefficient (ICC = 0.83) (Study 3 – Chapter 4).

5.3.7 Data collection

5.3.7.1 Community Health Workers

Primary health care is the main conventional health care available to rural Nigerians, and CHWs are the front line of primary health care in Nigeria (Chapters 1 and 4). CHWs
have post-secondary education equivalent to tertiary education in Nigeria, and are often acquainted with rural dwellers through initiatives such as immunisation (552). Therefore, their potential utility as research assistants for interviewer-administration of measures in rural Nigeria with low literacy rates is very high.

5.3.7.2 Training Community Health Workers for data collection

Ten CHWs (Figure 5.2) were trained for two weeks to collect all the data in this study. This ensured familiarity with the measures, standardised data collection protocols to ensure consistency, and minimised systematic differences and common survey errors such as coverage, sampling, measurement and non-response errors (52, 553). The CHWs were given a class room examination to assess competency at the end of the training. The details of the training, examination and the educational levels of CHWs are presented in Chapter four, section 4.3.5.2.

Figure 5.2: A training session for the CHWs involving cluster sampling with the area maps
5.3.7.3 Procedure for data collection

A battery of the adapted measures (Study 3 – Chapter 4) were organised in a booklet (Appendix 20) and given to the CHWs. Interviewer-administration was used for all self-report measures. This has been suggested to be a valid and reliable method of data collection in this rural population with low literacy rates (Study 3 – Chapter 4). Each CHW collected data from twenty participants from each rural community making a total of 200 people from ten communities.

5.3.7.4 Fidelity checks/bias control

Fidelity checks, adapted from Cox et al. (661), were done to avoid systematic differences in data collection by the CHWs. Involving only the CHWs that passed the post-training examinations (Study 3 – Chapter 4), facilitated adherence to data collection protocols. Motivation and adherence to data collection protocol was further facilitated by letting CHWs know a priori that only those that adhered to data collection protocols would be given certificates of participation at the end of data collection. Additionally, the researcher visited each CHW during data collection without prior arrangement, and assessed their interviewing styles, data recording and assessment of performance-based disability. Furthermore, a participant from each CHW was randomly selected, and the performance-based disability which is expected to be stable over time, was re-assessed by the researcher and compared with the CHW’s records.

5.3.8 Data Analyses

Data were analysed using descriptive and inferential statistics in IBM SPSS version 22. Inferential analyses were two-tailed. Data were assessed for normality using visual (normal distribution curve and Q-Q plot), and statistical methods (Kolmogorov-Smirnov, Shapiro-Wilk’s test and Skewness/Kurtosis scores) (Appendix 21). A limitation of normality tests is that the larger the sample size, the more likely to get significant results.
Thus, significant results may be obtained with only slight deviations from normality when sample sizes are large. Hence the final decisions on normality were based on the visual methods (Appendix 21).

Percentages and means with standard deviations were used to summarise demographic variables. Means with standard deviations, and medians with interquartile ranges were used to summarise all disability and biopsychosocial variables. The influence of gender on the summary score of all variables was assessed using t-test or Mann-Whitney U.

Univariate analyses were done with t-test, ANOVA and correlation analyses, to determine the influence of demographic variables on disability. The significant demographic factors (p<0.05) were included in sequential multiple regression analyses to control their effects. Pearson’s and Spearman’s correlation coefficients were used to investigate the bivariate relationship between each disability measure (Igbo-RMDQ, Igbo-WHODAS 2.0 and BPS), and the other variables (biopsychosocial factors), according to the normality of the data. Variables with significant correlations with Igbo-RMDQ and BPS were entered into sequential multiple regression analyses. Correlation coefficients were described as weak (0-0.2), moderate (0.3-0.6), and strong (0.7-1.0) (563).

Correlation coefficients above 0.1 with p<0.05 was the a priori set level for inclusion in the regression models. The assessment of the assumptions about collinearity and residuals were done by entering predictor variables that had significant correlations with Igbo-RMDQ and BPS into two standard multiple regression analyses (Appendix 25).

Sequential multiple regression analyses were used to control the effects of socio-demographic factors, calculate the standardised beta coefficients, and estimate the unique variance of Igbo-RMDQ and BPS explained by each significant predictor.

The Igbo-WHODAS 2.0 was not included in the regression analyses, but was used to describe the characteristics of the population surveyed in order to compare disability levels with population norms and to identify disability domains affected (52).

The ninth (causal) item of the Igbo-BIPQ is not normally included in total BIPQ scoring. It was therefore analysed by grouping responses into similar categories. A pie chart was used to graphically present the frequencies of the categories across the data set. Mann-
Whitney U was then used to investigate the association between each category and self-reported (Igbo-RMDQ) and performance-based disability (BPS).

As the assessment of biomechanical factors involved a total scoring of items 6 to 25 of the Igbo-ORFQ, items 1 to 5 which are binary (yes or no), and the first introductory question ‘**please describe the main tasks of your job**’ which is open and not numbered (500), were analysed separately. The introductory question was analysed categorically by grouping people’s responses about their main job tasks into manual or non-manual. Mann Whitney U was then used to determine the associations between manual and non-manual tasks, and Igbo-RMDQ and BPS. A total score was calculated for items 1 to 5: items 1 and 3 were scored as they were (yes=1; no=0), whereas items 2, 4 and 5 were reverse scored (no=1; yes=0), with higher total scores signifying more job control. Spearman’s correlation was then used to assess the association between job control, and Igbo-RMDQ and BPS.

Interaction analyses were used to determine if relationships between disability variables (RMDQ and BPS) and their predictor variables were influenced by other predictor variables. Bonferroni corrections were applied to minimise the risk of type 1 error. Post-hoc diagnostic tests (graphical and statistical analyses of residuals) were used to determine the accuracy of the regression models that predicted Igbo-RMDQ and BPS.
5.4 Results

5.4.1 Participant recruitment

Figure 5.3: Summary of sampling and response rates

Figure 5.3 shows that 226 people reported to the community centres following the announcements. It was planned a priori to recruit equal number of males and females from each of the ten communities, hence the need for stratification. However, it was difficult recruiting men as only a few came to the community centres following the village announcements. Therefore, additional men were recruited from work sites in each of the ten communities.

Of the eligible 203 participants, 168 were females which is over half of the required sample size of 200 people, and 35 were men. It was then decided to recruit as many men as possible, and then complete the sample size from the pool of 168 eligible women. The CHWs had collected the contact details of these women for future
correspondence. All 35 eligible men completed the interviewer-administered survey. The CHWs then visited different worksites in each community such as building sites and shops, and recruited additional 57 men. Three of these men could not be contacted further, and one man who started the survey, left before completing it. This gave a completion rate of 98%. The remaining 53 men completed the survey, making a total of 88 men.

Additional 112 people were needed to complete the sample size of 200. Therefore, 112 women were surveyed from the 168 that originally reported after the village announcements. All participants were surveyed in the community centres or work sites. Rigorous training of CHWs and interviewer-administration of measures ensured there were no missing data.
5.4.2 Participants’ characteristics

<table>
<thead>
<tr>
<th>Table 5.1: Participants’ demographic characteristics</th>
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</thead>
<tbody>
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<td>n=200</td>
</tr>
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</tr>
<tr>
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</tr>
<tr>
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<tr>
<td>Age (years)</td>
</tr>
<tr>
<td>Education (years)</td>
</tr>
<tr>
<td>Current marital status</td>
</tr>
<tr>
<td>Currently married</td>
</tr>
<tr>
<td>Widowed</td>
</tr>
<tr>
<td>Never married</td>
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<td>Cohabiting</td>
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<tr>
<td>Separated</td>
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<tr>
<td>Paid work</td>
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<td>Non-paid work (volunteer or charity)</td>
</tr>
<tr>
<td>Keeping house/homemaker</td>
</tr>
<tr>
<td>Student</td>
</tr>
<tr>
<td>Unemployed (health reasons)</td>
</tr>
<tr>
<td>Unemployed (other reasons)</td>
</tr>
<tr>
<td>Retired</td>
</tr>
</tbody>
</table>

SD: standard deviation

Table 5.1 shows that slightly over half of the participants were females 112 (56.0%). The mean age of the participants was 48.6 years. Mean years of education was 7.0 years, corresponding to completed primary school education. The majority of the participants were currently married (71.5%). Self-employment was the predominant mode of occupation (62.5%).
Table 5.2: Biopsychosocial characteristics of participants (summary measures)

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<thead>
<tr>
<th>VARIABLE</th>
<th>n=200</th>
<th>Mean (SD)</th>
<th>Median (IQR)</th>
</tr>
</thead>
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<td>Igbo-RMDQ</td>
<td>11.12 (6.5)</td>
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</tr>
<tr>
<td>BPS</td>
<td>6.63 (3.7)</td>
<td>6.5 (4.0, 9.8)</td>
<td></td>
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<td>Igbo-WHODAS (Total)</td>
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<td>21.4 (9.9, 33.7)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>n=200</th>
<th>Mean (SD)</th>
<th>Median (IQR)</th>
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</thead>
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<tr>
<td>Participation</td>
<td>30.9 (21.4)</td>
<td>28.1 (15.6, 46.9)</td>
<td></td>
</tr>
<tr>
<td>Mobility</td>
<td>30.8 (22.5)</td>
<td>30.0 (10.0, 45.0)</td>
<td></td>
</tr>
<tr>
<td>Life activities</td>
<td>30.3 (22.4)</td>
<td>25.0 (12.5, 46.9)</td>
<td></td>
</tr>
<tr>
<td>Cognition</td>
<td>17.4 (19.7)</td>
<td>12.5 (0.0, 29.2)</td>
<td></td>
</tr>
<tr>
<td>Getting along</td>
<td>15.6 (17.9)</td>
<td>10.0 (0.0, 25.0)</td>
<td></td>
</tr>
<tr>
<td>Self-care</td>
<td>11.8 (14.6)</td>
<td>6.3 (0.0, 18.8)</td>
<td></td>
</tr>
<tr>
<td>Igbo-BS-11</td>
<td>5.3 (2.1)</td>
<td>5.0 (4.0, 7.0)</td>
<td></td>
</tr>
<tr>
<td>Igbo-HADS</td>
<td>HADS-A</td>
<td>7.2 (4.5)</td>
<td>7.0 (3.0, 11.0)</td>
</tr>
<tr>
<td>HADS-D</td>
<td>7.5 (3.47)</td>
<td>8.0 (5.3, 10.0)</td>
<td></td>
</tr>
<tr>
<td>Igbo-CSQ</td>
<td>Control</td>
<td>3.9 (1.3)</td>
<td>4.0 (3.0, 5.0)</td>
</tr>
<tr>
<td>Decrease pain</td>
<td>3.6 (1.3)</td>
<td>3.5 (3.0, 4.0)</td>
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</tr>
<tr>
<td>Praying/hoping</td>
<td>27.8 (7.3)</td>
<td>30.0 (25.0, 33.0)</td>
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<td>Coping self-statements</td>
<td>23.8 (7.0)</td>
<td>25.0 (19.0, 29.0)</td>
<td></td>
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<tr>
<td>Diverting attention</td>
<td>17.9 (9.3)</td>
<td>20.0 (11.0, 25.0)</td>
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<tr>
<td>Increased behavioural activities</td>
<td>16.9 (8.1)</td>
<td>19.0 (10.0, 23.8)</td>
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<tr>
<td>Ignoring sensations</td>
<td>16.6 (7.5)</td>
<td>18.0 (10.0, 22.0)</td>
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<tr>
<td>Reinterpreting pain sensation</td>
<td>15.1 (8.9)</td>
<td>17.0 (7.0, 22.0)</td>
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<tr>
<td>Catastrophising</td>
<td>13.6 (8.2)</td>
<td>13.0 (7.0, 20.0)</td>
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<tr>
<td>Igbo-MSPSS</td>
<td>62.4 (13.3)</td>
<td>64.0 (52.0, 72.0)</td>
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<tr>
<td>Igbo-ORFQ</td>
<td>4.6 (4.7)</td>
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<tr>
<td>Igbo-BIPQ</td>
<td>37.5 (8.7)</td>
<td>38.0 (32.0, 44.0)</td>
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<tr>
<td>Igbo-FABQ</td>
<td>39.2 (15.9)</td>
<td>43.0 (23.3, 53.0)</td>
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</tbody>
</table>

SD: standard deviation; IQR: interquartile range; RMDQ: Roland Morris Disability Questionnaire; BPS: Back Performance Scale; WHODAS: World Health Organisation Disability Assessment Schedule; BS-11: eleven point box scale for pain; HADS-A: Hospital Anxiety and Depression Scale Anxiety subscale; HADS-D: Hospital Anxiety and Depression Scale Depression subscale; CSQ: Coping Strategies Questionnaire; MSPSS: Multidimensional Scale of Perceived Social Support; ORFQ: Occupational Risk Factor Questionnaire; BIPQ: Brief Illness Perception Questionnaire; FABQ: Fear Avoidance Beliefs Questionnaire.

Table 5.2 shows the wide variations in outcomes among the participants. Igbo-RMDQ, BPS, pain scale (Igbo-BS-11), Igbo-HADS and Igbo-BIPQ were normally distributed. Igbo-MSPSS, Igbo-FABQ, Igbo-ORFQ and Igbo-CSQ were not normally distributed (Appendix 21). Mean and median scores were similar except for four domains of disability measured with the WHODAS 2.0 (life activities, cognition, getting along and self-care). Mean WHODAS 2.0 disability score of 22.81 corresponds to the 85th percentile of population norms (52). The domains of WHODAS disability with the highest scores were participation, mobility and life activities.
Table 5.3: Influence of gender on summary measures

<table>
<thead>
<tr>
<th></th>
<th>Female n=112</th>
<th>Male n=88</th>
<th>t-test† Mann-Whitney U§ (P-value)</th>
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<tr>
<td>Igbo-RMDQ</td>
<td>Mean (SD) CI</td>
<td>Mean (SD) CI</td>
<td></td>
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<tr>
<td>BPS</td>
<td>12.3 (6.3) (11.2, 13.5)</td>
<td>9.6 (6.5) (8.21, 10.95)</td>
<td>3.0**†</td>
</tr>
<tr>
<td>Igbo-WHODAS (total)</td>
<td>Mean (SD) CI</td>
<td>Mean (SD) CI</td>
<td></td>
</tr>
<tr>
<td>Participation</td>
<td>32.5 (21.8) (28.4, 36.6)</td>
<td>28.9 (20.9) (24.5, 33.4)</td>
<td>4502.0§</td>
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<tr>
<td>Mobility</td>
<td>34.9 (23.1) (30.5, 39.6)</td>
<td>25.7 (20.9) (21.3, 30.1)</td>
<td>3772.0**§</td>
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<tr>
<td>Life activities</td>
<td>32.3 (22.8) (28.0, 36.5)</td>
<td>27.8 (21.8) (23.2, 32.5)</td>
<td>4363.5§</td>
</tr>
<tr>
<td>Cognition</td>
<td>19.8 (19.9) (16.0, 23.5)</td>
<td>14.5 (19.1) (10.5, 18.5)</td>
<td>3932.5**§</td>
</tr>
<tr>
<td>Getting along</td>
<td>15.5 (17.5) (12.3, 18.8)</td>
<td>15.7 (18.4) (11.8, 19.6)</td>
<td>4732.5§</td>
</tr>
<tr>
<td>Self-care</td>
<td>12.3 (14.2) (9.6, 14.9)</td>
<td>11.1 (15.0) (7.9, 14.3)</td>
<td>4466.0§</td>
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<tr>
<td>Pain intensity</td>
<td>5.6 (2.1) (5.2, 6.0)</td>
<td>4.9 (2.0) (4.5, 5.3)</td>
<td>2.3*†</td>
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<tr>
<td>Igbo-HADS</td>
<td>Mean (SD) CI</td>
<td>Mean (SD) CI</td>
<td></td>
</tr>
<tr>
<td>HADS-A</td>
<td>7.9 (4.4) (7.1, 8.7)</td>
<td>6.4 (4.4) (5.5, 7.3)</td>
<td>2.4*†</td>
</tr>
<tr>
<td>HADS-D</td>
<td>7.6 (3.3) (7.0, 8.3)</td>
<td>7.3 (3.7) (6.5, 8.0)</td>
<td>0.8†</td>
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<tr>
<td>Igbo-MSPSS</td>
<td>Mean (SD) CI</td>
<td>Mean (SD) CI</td>
<td></td>
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<tr>
<td>ORFQ</td>
<td>63.2 (12.7) (60.9, 65.6)</td>
<td>61.4 (14.0) (58.4, 64.3)</td>
<td>1.0†</td>
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<td>Igbo-BIPQ</td>
<td>3.4 (3.4) (2.8, 4.0)</td>
<td>6.0 (5.6) (4.8, 7.2)</td>
<td>3631.5**§</td>
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<td>Igbo-FABQ</td>
<td>38.2 (8.8) (36.5, 39.8)</td>
<td>36.7 (8.6) (34.9, 38.5)</td>
<td>1.2†</td>
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<td>Igbo-CSQ</td>
<td>Mean (SD) CI</td>
<td>Mean (SD) CI</td>
<td></td>
</tr>
<tr>
<td>CSQ-Control</td>
<td>4.1 (1.2) (3.8, 4.3)</td>
<td>3.8 (1.3) (3.5, 4.0)</td>
<td>4380.0</td>
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<td>CSQ-Decrese pain</td>
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<td>3.6 (1.3) (3.3, 3.9)</td>
<td>4905.5</td>
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<tr>
<td>Praying/hoping</td>
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<td>27.3 (7.8) (25.6, 28.9)</td>
<td>4691.5§</td>
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<tr>
<td>Coping self statements</td>
<td>24.0 (6.8) (22.8, 25.3)</td>
<td>23.4 (7.2) (21.9, 25.0)</td>
<td>4708.0§</td>
</tr>
<tr>
<td>Diverting attention</td>
<td>18.3 (9.2) (16.6, 20.0)</td>
<td>17.4 (9.5) (15.4, 19.4)</td>
<td>4675.0§</td>
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<tr>
<td>Increased Behavioural activities</td>
<td>17.0 (8.2) (15.4, 18.4)</td>
<td>16.9 (8.0) (15.2, 18.6)</td>
<td>4901.0§</td>
</tr>
<tr>
<td>Ignoring sensations</td>
<td>16.8 (7.4) (15.5, 18.2)</td>
<td>16.4 (7.6) (14.7, 18.0)</td>
<td>4740.0§</td>
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<tr>
<td>Reinterpreting pain sensation</td>
<td>15.0 (8.7) (13.3, 16.6)</td>
<td>15.3 (9.1) (13.3, 17.2)</td>
<td>4770.0§</td>
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<tr>
<td>Catastrophising</td>
<td>14.6 (8.2) (13.0, 16.1)</td>
<td>12.4 (8.1) (10.7, 14.1)</td>
<td>4181.0§</td>
</tr>
</tbody>
</table>

*p<0.05; **p<0.01; SD: standard deviation; CI: confidence interval; RMDQ: Roland Morris Disability Questionnaire; BPS: Back Performance Scale; WHODAS: World Health Organisation Disability Assessment Schedule; BS-11: eleven point box scale for pain; HADS-A: Hospital Anxiety and Depression Scale Anxiety subscale; HADS-D: Hospital Anxiety and Depression Scale Depression subscale; CSQ: Coping Strategies Questionnaire; MSPSS: Multidimensional Scale of Perceived Social Support; ORFQ: Occupational Risk Factor Questionnaire; BIPQ: Brief Illness Perception Questionnaire; FABQ: Fear Avoidance Beliefs Questionnaire.
Table 5.3 above shows higher mean scores for females in all variables except for getting along (Igbo-WHODAS), Igbo-ORFQ, Igbo-FABQ, and two subscales of the Igbo-CSQ: increased behavioural activities and reinterpreting pain sensations. Of these, Igbo-RMDQ and BPS, mobility and cognition domains of the Igbo-WHODAS, pain (Igbo-BS-11), Igbo-HADS (anxiety) and Igbo-ORFQ were significant (p<0.05).

5.4.3 Fidelity results

CHWs adhered to the recommended interviewing styles emphasized during the training (see Appendix 18 for the training manual). Examples include maintaining neutrality throughout the interview, not reacting by gesture or word, either positively or negatively to any responses; discouragement of digression, distraction and inappropriate enquiries; not changing the wording and sequence of questions in the battery of the adapted measures (Appendix 20). Data recording was adequate as this was planned a priori. CHWs provided only one answer to each item, marked in the space provided for each item in each measure, without a total scoring (the researcher did the total scoring of all measures). The assessment of performance-based disability was adequate. For instance, CHWs used the tape measures adequately to assess 10 cm between the feet, and measured the distance between the fingertips and the floor, for the finger-tip-to-floor test. The performance-based disability levels recorded by the researcher and the CHWs were similar for the randomly selected participants (exact values or differences of not more than 2 were observed).

5.4.4 Associations between disability and biopsychosocial factors

Table 5.4 below shows the bivariate Pearson’s and Spearman’s correlation coefficients between each disability measure (Igbo-RMDQ, Igbo-WHODAS 2.0 and BPS), and the other variables (biopsychosocial factors).

A strong significant positive correlation between Igbo-RMDQ and BPS (r=0.646, n=200, P<0.001, two tailed) was found. A moderate significant correlation between Igbo-
WHODAS and Igbo-RMDQ ($r_s=0.537$, $n=200$, $P<0.001$, two tailed) was found, while correlation between Igbo-WHODAS and BPS was comparatively weaker but still significant ($r_s=0.343$, $n=200$, $P<0.001$, two tailed).
<table>
<thead>
<tr>
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<th>16</th>
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<tbody>
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<td>1 Igbo-RMDQ</td>
<td>.646**</td>
<td>.537**</td>
<td>.608**</td>
<td>.570**</td>
<td>.300**</td>
<td>-.108</td>
<td>-.037</td>
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<td>.302**</td>
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<td>.333**</td>
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<td>.124</td>
<td>-.145*</td>
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<td>.560**</td>
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<td>2 Igbo-BPS</td>
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<td>.417**</td>
<td>.345**</td>
<td>.328**</td>
<td>-.216**</td>
<td>-.043</td>
<td>.369**</td>
<td>.150*</td>
<td>.302**</td>
<td>.071</td>
<td>.297**</td>
<td>.303**</td>
<td>.297**</td>
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<td>-.058</td>
<td>.537**</td>
<td>.426**</td>
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<td>3 Igbo-WHODAS</td>
<td>-</td>
<td>-</td>
<td>.556**</td>
<td>.713**</td>
<td>.504**</td>
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<td>.391**</td>
<td>.459**</td>
<td>.589**</td>
<td>.371**</td>
<td>.265**</td>
<td>.237**</td>
<td>.324**</td>
<td>-.230**</td>
<td>-.383**</td>
<td>.227**</td>
<td>.568**</td>
</tr>
<tr>
<td>4 Igbo-BS-11 (Pain intensity)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>.484**</td>
<td>.373**</td>
<td>-.027</td>
<td>-.030</td>
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<tr>
<td>5 Igbo-HADS A</td>
<td>-</td>
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<td>-</td>
<td>.491**</td>
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<td>.079</td>
<td>.413**</td>
<td>.353**</td>
<td>.669**</td>
<td>.312**</td>
<td>.220**</td>
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<td>.366**</td>
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<td>-.204**</td>
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<td>6 Igbo-HADS D</td>
<td>-</td>
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<td>.011</td>
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<td>.275**</td>
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<td>.307**</td>
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<td>13 Igbo-CSQ PH</td>
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<td>14 Igbo-CSQ CSS</td>
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<td>-.007</td>
<td>.039</td>
<td>.309**</td>
<td>.565**</td>
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<td>16 Igbo-MSPSS</td>
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<td>-.215</td>
<td>.226**</td>
<td>.002**</td>
<td>.047</td>
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<td>17 Igbo-ORFQ</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-.022</td>
<td>-.050</td>
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</tr>
<tr>
<td>18 Igbo-BIQ</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>.375**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19 Igbo-FABQ</td>
<td>-</td>
<td>-</td>
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<td>-</td>
<td>-</td>
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<td>-</td>
<td>-</td>
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</tr>
</tbody>
</table>

** Significant at Bonferroni 0.0028 level (2-tailed); *Significant at p<0.05 level (2-tailed); RMDQ: Roland Morris Disability Questionnaire; BPS: Back Performance Scale; WHODAS: World Health Organisation Disability Assessment Schedule; BS-11: 11-point box scale; HADS A: Anxiety; HADS D: Depression; CSQ: Coping strategies questionnaire; CSQ C: control pain; CSQ D: decrease pain; CSQ DA: diverting attention; CSQ RPS: reinterpreting pain sensations; CSQ CAT: catastrophizing; CSQ IPS: ignoring pain sensations; CSQ PH: Praying/hoping; CSQ CSS: coping self-statements; CSQ IBA: increased behavioural activities. MSPSS: Multidimensional Scale of Perceived Social Support; ORFQ: Occupational Risk Factor Questionnaire; BIPQ: Brief Illness Perception Questionnaire; FABQ: Fear Avoidance Beliefs Questionnaire. Pearson correlation was used for all variables except for WHODAS, CSQ, ORFQ and FABQ.
Igbo-RMDQ had significant moderate positive correlations with pain intensity, anxiety, depression, illness perceptions, fear avoidance beliefs, and coping strategies: diverting attention, reinterpreting pain sensation, catastrophising, ignoring pain sensations, praying and hoping, coping self-statements and increased behavioural activities.

Igbo-RMDQ had significant low negative correlation with occupational biomechanical factors at p<0.05 but not with Bonferroni correction p<0.0028.

BPS had significant moderate positive correlations with pain intensity, anxiety, depression, social support, illness perceptions, fear avoidance beliefs and coping strategies: diverting attention, catastrophising, praying and hoping, coping self-statements and increased behavioural activities. The coping strategy: reinterpreting pain sensation had a low correlation with BPS which was significant at p<0.05 but not with Bonferroni correction p<0.0028.

BPS had a significant low negative correlation with the Igbo-CSQ pain self-efficacy scale: ability to control pain.

Igbo-WHODAS 2.0 had significant moderate positive correlations with pain intensity, anxiety, depression, fear avoidance beliefs and coping strategies: diverting attention, reinterpreting pain sensations, catastrophising, ignoring pain sensations, praying or hoping and increased behavioural activities. Illness perceptions and coping strategy: coping self-statements, had significant low positive correlations with Igbo-WHODAS. Igbo-CSQ item: ability to control pain had a low positive correlation with Igbo-WHODAS 2.0, significant at p<0.05 but not with Bonferroni correction p<0.0028.

Igbo-WHODAS had a significant moderate negative correlation with occupational biomechanical factors but had a significant low negative correlation with social support.

Predictor biopsychosocial variables entered into the regression models for Igbo-RMDQ and BPS, based on the a priori set correlation coefficients are pain intensity (Igbo-BS11), anxiety and depression (Igbo-HADS), social support (Igbo-MSPSS), biomechanical factors (Igbo-ORFQ), illness perceptions (Igbo-BIPQ), fear avoidance beliefs (Igbo-FABQ) and coping strategies (subscales of the Igbo-CSQ).
There were no strong correlations between the possible predictor variables except the Igbo-CSQ subscales, none of which had a significant negative association with disability. As the Igbo-CSQ subscales were strongly associated with each other, only catastrophising was included in multiple regression analyses to avoid multicollinearity. The choice of catastrophising was informed by the studies in Chapters two and four (Studies 1 and 3). These studies suggested that catastrophising was the most defined of the Igbo-CSQ subscales, and was associated with the experience of CLBP in this population. Moreover, catastrophising had comparatively stronger association with Igbo-RMDQ and BPS than most of the other Igbo-CSQ subscales (Table 5.4).
Table 5.5: Influence of demographic variables on Igbo-RMDQ and BPS

<table>
<thead>
<tr>
<th>Variables (n=200)</th>
<th>RMDQ</th>
<th>BPS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>t (p-value)</td>
<td>B (p-value)</td>
</tr>
<tr>
<td>Gender (female)</td>
<td>3.0**</td>
<td>2.7**</td>
</tr>
<tr>
<td></td>
<td>r (p-value)</td>
<td>B (p-value)</td>
</tr>
<tr>
<td>Age (years)</td>
<td>0.3**</td>
<td>0.1**</td>
</tr>
<tr>
<td></td>
<td>-0.3**</td>
<td>-0.3**</td>
</tr>
<tr>
<td>Education (years)</td>
<td>F (p-value)</td>
<td>B (p-value)</td>
</tr>
<tr>
<td>Marital status</td>
<td>2.7*</td>
<td>4.4**</td>
</tr>
<tr>
<td></td>
<td>df=4, 195</td>
<td>df=4, 195</td>
</tr>
<tr>
<td>Work Status</td>
<td>4.0**</td>
<td>2.5*</td>
</tr>
<tr>
<td></td>
<td>df=7, 192</td>
<td>df=7, 192</td>
</tr>
</tbody>
</table>

** Significant at p<0.01 level (2-tailed); *Significant at p<0.05 level (2-tailed); r, r; Spearman’s/Pearson’s correlation Sex, marital status and occupation are categorical variables; t= t test; r= correlation; B= correlation coefficient; F= ANOVA

Table 5.5 shows the univariate analyses done to explore the influence of demographic variables, in order to identify and control their influence in multiple regression analyses. All demographic variables except marital status were significantly associated with Igbo-
RMDQ. A further analysis of marital status showed that being ‘widowed’ reached statistical significance and was included in the multiple regression analysis with Igbo-RMDQ as the criterion variable. Similarly, work status as a whole was significantly associated with Igbo-RMDQ, however, only ‘unemployed for health reasons’ accounted for the significance. This was included in the multiple regression analyses.

All demographic variables were significantly associated with BPS. On further analyses, none of the marital status categories was significantly associated with BPS, hence marital status was excluded from the multiple regression analysis with BPS. Similarly, work status as a whole had a statistically significant association with BPS. On further analyses, none of the work status categories had a statistically significant association with BPS, and were consequently excluded from the multiple regression analyses with BPS (Table 5.5).

**Table 5.6: Binary coding of categorical demographic variables**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>1 female</td>
</tr>
<tr>
<td></td>
<td>0 Male</td>
</tr>
<tr>
<td>Marital status</td>
<td>1 widowed</td>
</tr>
<tr>
<td></td>
<td>0 others</td>
</tr>
<tr>
<td>Work status</td>
<td>1 unemployed for health reasons</td>
</tr>
<tr>
<td></td>
<td>0 others</td>
</tr>
</tbody>
</table>

Table 5.6 shows the binary variables (dummy codes) created for gender, marital status and work status, to enable their inclusion in multiple regression analyses.
5.4.5 Predictors of chronic low back pain disability

Table 5.7: Sequential multiple regression analysis predicting self-reported disability (Igbo-RMDQ)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th></th>
<th></th>
<th>Model 2</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>n=200</td>
<td>B (95% CI)</td>
<td>SEB</td>
<td>β</td>
<td>B (95% CI)</td>
<td>SEB</td>
<td>β</td>
</tr>
<tr>
<td>Gender (female)</td>
<td>1.732</td>
<td>(0.907)</td>
<td>0.133∞</td>
<td>1.343</td>
<td>(0.662)</td>
<td>0.103*</td>
</tr>
<tr>
<td>(male= reference)</td>
<td>(-0.6, 3.5)</td>
<td></td>
<td></td>
<td>(0.04, 2.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.050</td>
<td>(0.042)</td>
<td>0.093</td>
<td>0.015</td>
<td>(0.029)</td>
<td>0.028</td>
</tr>
<tr>
<td>(95% CI)</td>
<td></td>
<td></td>
<td></td>
<td>(0.04, 0.07)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>-0.244</td>
<td>(0.079)</td>
<td>-0.241**</td>
<td>-0.039</td>
<td>(0.057)</td>
<td>-0.039</td>
</tr>
<tr>
<td>(95% CI)</td>
<td></td>
<td></td>
<td></td>
<td>(-0.15, 0.07)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marital Status (widowed) (Other marital status= reference)</td>
<td>2.016</td>
<td>(1.302)</td>
<td>0.024</td>
<td>0.903</td>
<td>0.001</td>
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<tr>
<td>Work status (unemployed-health reasons)</td>
<td>10.448</td>
<td>(3.029)</td>
<td>0.226**</td>
<td>3.717</td>
<td>(2.154)</td>
<td>0.080</td>
</tr>
<tr>
<td>(95% CI)</td>
<td></td>
<td></td>
<td></td>
<td>(-0.53, 7.97)</td>
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<td></td>
</tr>
<tr>
<td>Pain (Igbo-BS-11)</td>
<td></td>
<td></td>
<td></td>
<td>0.718</td>
<td>0.177</td>
<td>0.230**</td>
</tr>
<tr>
<td>(95% CI)</td>
<td></td>
<td></td>
<td></td>
<td>(0.37, 1.07)</td>
<td></td>
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</tr>
<tr>
<td>Anxiety (Igbo-HADS)</td>
<td>0.224</td>
<td>(0.098)</td>
<td>0.154*</td>
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</tr>
<tr>
<td>(95% CI)</td>
<td></td>
<td></td>
<td></td>
<td>(0.03, 0.42)</td>
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</tr>
<tr>
<td>Depression (Igbo-HADS)</td>
<td>-0.200</td>
<td>(0.099)</td>
<td>-0.107*</td>
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<tr>
<td>(95% CI)</td>
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<td></td>
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<td>(-0.40, -0.01)</td>
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<tr>
<td>Catastrophizing (Igbo-CSQ)</td>
<td>0.167</td>
<td>(0.049)</td>
<td>0.210**</td>
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<td></td>
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<tr>
<td>(95% CI)</td>
<td></td>
<td></td>
<td></td>
<td>(0.07, 0.26)</td>
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<tr>
<td>Illness perceptions (Igbo-BIPQ)</td>
<td>0.215</td>
<td>(0.038)</td>
<td>0.289**</td>
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<tr>
<td>(95% CI)</td>
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<td>(0.14, 0.29)</td>
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<td>Fear avoidance beliefs (Igbo-FABQ)</td>
<td>0.081</td>
<td>(0.024)</td>
<td>0.198**</td>
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</tr>
<tr>
<td>(95% CI)</td>
<td></td>
<td></td>
<td></td>
<td>(0.03, 0.13)</td>
<td></td>
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<tr>
<td>Occupational biomechanical factors (Igbo-ORFQ)</td>
<td>0.017</td>
<td>(0.068)</td>
<td>0.013</td>
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</tr>
<tr>
<td>(95% CI)</td>
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<td></td>
<td></td>
<td>(-0.12, 0.15)</td>
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<tr>
<td>R²</td>
<td>0.202</td>
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<td></td>
<td>0.647</td>
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<tr>
<td>R² change</td>
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<td></td>
<td>0.645</td>
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<tr>
<td>F for change in R²</td>
<td>F (5, 194) =9.824**</td>
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<td></td>
<td>F (7, 187) =33.745**</td>
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<tr>
<td>Adjusted R²</td>
<td>0.181</td>
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<td></td>
<td>0.625</td>
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</tbody>
</table>

B=Unstandardised, β =Standardised, SEB= standard error of Beta, *p<0.05, **p<0.01, ∞p=0.058

Table 5.7 shows the sequential multiple regression analysis predicting Igbo-RMDQ. In model 1, all demographic variables significantly associated with Igbo-RMDQ (Table 5.5) were entered into the first block of a sequential multiple regression to control their
effects. This model explained 18.1% of the variance in Igbo-RMDQ (Adjusted $R^2= 0.181$), and was significant ($F (5,194) = 9.824, P<0.0005$). Model 2, in which other significant correlates (Table 5.4) were added, explained significantly more variance ($R^2$ change$=0.45$, $F (7, 187) =33.75, p<0.0005$) with the model explaining 62.5% of the variance in Igbo-RMDQ (Adjusted $R^2=0.625$). The significant predictors of Igbo-RMDQ were illness perceptions ($\beta=0.289; p<0.0005$), pain intensity ($\beta=0.230; p<0.0005$), catastrophising ($\beta=0.210; p=0.001$), fear avoidance beliefs ($\beta=.198; p=0.001$) and anxiety ($\beta=0.154; p=0.023$). Female gender ($\beta= 0.103; p=0.044$) and depression ($\beta= -0.107; p=0.044$) barely reached statistical significance. Gender was the only demographic variable that remained significant at $p<0.05$. Notably, depression which had a positive correlation with disability (Table 5.4), had a negative association with disability when other predictors were included (Table 5.7).
Table 5.8: Sequential multiple regression analysis predicting performance-based disability (BPS)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th></th>
<th>Model 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$n=200$</td>
<td>$B$ (95% CI)</td>
<td>SEB</td>
<td>$\beta$</td>
</tr>
<tr>
<td>Gender (female) (Male=reference)</td>
<td></td>
<td>1.829 (0.85, 2.81)</td>
<td>0.495</td>
<td>0.248**</td>
</tr>
<tr>
<td>Age</td>
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<td>0.076 (0.03, 0.12)</td>
<td>0.024</td>
<td>0.250**</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td>-0.033 (-0.12, 0.06)</td>
<td>0.045</td>
<td>-0.058</td>
</tr>
<tr>
<td>Pain (Igbo-11-BS)</td>
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<td>0.155 (-0.07, 0.38)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety (Igbo-HADS)</td>
<td></td>
<td>0.051 (-0.08, 0.18)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression (Igbo-HADS)</td>
<td></td>
<td>0.091 (-0.04, 0.22)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catastrophising (Igbo-CSQ)</td>
<td></td>
<td>-0.018 (-0.08, 0.05)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social support (Igbo-MSPSS)</td>
<td></td>
<td>0.08 (0.05, 0.11)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illness perceptions (Igbo-BIPQ)</td>
<td></td>
<td>0.154 (0.11, 0.20)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fear avoidance beliefs (Igbo-FABQ)</td>
<td></td>
<td>0.044 (0.01, 0.07)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td></td>
<td>0.149</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$ change</td>
<td></td>
<td>0.149</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F for change in $R^2$</td>
<td></td>
<td>F (3, 196) =11.418**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td></td>
<td>0.136</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*B=Unstandardised, $\beta$=Standardised, SEB= standard error of Beta, *p<0.05, **p<0.01

Table 5.8 shows that all demographic variables significantly associated with BPS (Table 5.5) were entered into the first block of a sequential multiple regression to control their effects (Model 1). This model explained 13.6% of the variance in BPS and was significant (F (3,196) =11.418, P<0.0005). Model 2, in which other significant correlates (Table 5.4) were added, explained significantly more variance ($R^2$ change=0.37, F (7, 189) =20.507, p<0.0005), with the model explaining 49.1% of the variance in BPS (Adjusted $R^2$=0.491). The significant predictors of BPS were illness perceptions ($\beta$=0.366; p<0.0005), social support ($\beta$=0.290; p<0.0005), fear avoidance beliefs ($\beta$=0.189; p<0.01) and female
gender (β=0.184; p<0.01). Gender was the only demographic variable that remained significant at p<0.01.

As BIPQ was the strongest predictor of both RMDQ and BPS, it was further analysed to understand the contribution of each item of the BIPQ (eight dimensions of illness perceptions). The ninth BIPQ (causal) item was analysed categorically.

Table 5.9: Bivariate correlations of Igbo-BIPQ items

<table>
<thead>
<tr>
<th></th>
<th>n=200</th>
<th>BIPQ2</th>
<th>BIPQ3</th>
<th>BIPQ4</th>
<th>BIPQ5</th>
<th>BIPQ6</th>
<th>BIPQ7</th>
<th>BIPQ8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Igbo-BIPQ1</td>
<td></td>
<td>.106</td>
<td>.011</td>
<td>.390**</td>
<td>.520**</td>
<td>.690**</td>
<td>.377**</td>
<td>.671**</td>
</tr>
<tr>
<td>Igbo-BIPQ2</td>
<td>-</td>
<td>-136</td>
<td>-106</td>
<td>-035</td>
<td>.126</td>
<td>-.029</td>
<td>-.026</td>
<td></td>
</tr>
<tr>
<td>Igbo-BIPQ3</td>
<td>-</td>
<td>-</td>
<td>.479**</td>
<td>.201**</td>
<td>-.025</td>
<td>.238**</td>
<td>.074</td>
<td></td>
</tr>
<tr>
<td>Igbo-BIPQ4</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>.377**</td>
<td>.250**</td>
<td>.333**</td>
<td>.326**</td>
<td></td>
</tr>
<tr>
<td>Igbo-BIPQ5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>.373**</td>
<td>.450**</td>
<td>.522**</td>
<td></td>
</tr>
<tr>
<td>Igbo-BIPQ6</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>.336**</td>
<td>.680**</td>
<td></td>
</tr>
<tr>
<td>Igbo-BIPQ7</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>.397**</td>
<td></td>
</tr>
<tr>
<td>Igbo-BIPQ8</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

*P<0.05; **p<0.01 (2-tailed); BIPQ: Brief Illness Perception Questionnaire; BIPQ1: Consequences; BIPQ2: Timeline; BIPQ3: Personal Control; BIPQ4: Treatment control; BIPQ5: Identity; BIPQ6: Illness concern; BIPQ7: Coherence; BIPQ8: Emotional representation

Table 5.9 shows the Pearson’s correlation coefficients of eight items of the Igbo-BIPQ. There were no strong correlations between any of the items in the Igbo-BIPQ. Collinearity of Igbo-BIPQ items was also assessed with tolerance and Variance Inflation Factor (VIF), and none was significant (Appendix 26).
Table 5.10: Sequential multiple regression analyses of BIPQ items predicting Igbo-RMDQ.

<table>
<thead>
<tr>
<th>Variable</th>
<th>B (95% CI)</th>
<th>SEB</th>
<th>β</th>
<th>R²</th>
<th>Adjusted R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Igbo-BIPQ total score</td>
<td>0.215 (0.14, 0.29)</td>
<td>0.038</td>
<td>0.289**</td>
<td>0.647</td>
<td>0.625</td>
</tr>
<tr>
<td>Consequences</td>
<td>0.713 (0.432, 0.994)</td>
<td>0.142</td>
<td>0.287**</td>
<td>0.635</td>
<td>0.612</td>
</tr>
<tr>
<td>Timeline</td>
<td>0.447 (0.162, 0.732)</td>
<td>0.144</td>
<td>0.157**</td>
<td>0.606</td>
<td>0.581</td>
</tr>
<tr>
<td>Personal Control</td>
<td>-0.034 (-0.310, 0.241)</td>
<td>0.140</td>
<td>-0.012</td>
<td>0.586</td>
<td>0.560</td>
</tr>
<tr>
<td>Treatment Control</td>
<td>0.384 (0.091, 0.676)</td>
<td>0.148</td>
<td>0.133*</td>
<td>0.601</td>
<td>0.575</td>
</tr>
<tr>
<td>Identity</td>
<td>0.527 (0.227, 0.827)</td>
<td>0.152</td>
<td>0.202**</td>
<td>0.611</td>
<td>0.586</td>
</tr>
<tr>
<td>Illness concern</td>
<td>0.830 (0.558, 1.102)</td>
<td>0.138</td>
<td>0.316**</td>
<td>0.653</td>
<td>0.631</td>
</tr>
<tr>
<td>Coherence</td>
<td>0.101 (-0.181, 0.383)</td>
<td>0.143</td>
<td>0.038</td>
<td>0.587</td>
<td>0.561</td>
</tr>
<tr>
<td>Emotional representation</td>
<td>0.634 (0.396, 0.872)</td>
<td>0.121</td>
<td>0.299**</td>
<td>0.639</td>
<td>0.616</td>
</tr>
</tbody>
</table>

**Significant at Bonferroni 0.0063 level (2-tailed); *Significant at 0.05 RMDQ; Roland Morris Disability Questionnaire; BIPQ: Brief Illness Perception Questionnaire; BIPQ1: Consequences; BIPQ2: Timeline; BIPQ3: Personal control; BIPQ4: Treatment control; BIPQ5: Identity; BIPQ6: Illness concern; BIPQ7: Coherence; BIPQ8: Emotional representation.

In Table 5.10, each of the eight items of the Igbo-BIPQ were entered as predictors into the sequential multiple regression analysis that predicted Igbo-RMDQ for model 2 (Table 5.7), in place of total Igbo-BIPQ score. The total Igbo-BIPQ score is copied from Table 5.7 for comparison with the Igbo-BIPQ items while the other variables from Table 5.7 are not shown in Table 5.10 for brevity. A Bonferroni-adjusted significance level of 0.0063 (8 analyses with each analysis including one Igbo-BIPQ item) was used to account for the increased possibility of type I error. Illness concern (β=0.316; p<0.0005), emotional representation (β=0.299; p<0.0005), consequences (β=0.287; p<0.0005), identity (β=0.202; p=0.001) and timeline (β=0.157; p=0.002) were significant. Illness concern produced the strongest model (adjusted R²= 0.631), compared with the other Igbo-BIPQ items, and explained more variance in Igbo-RMDQ than the model with total Igbo-BIPQ (adjusted R²=0.625). Other Igbo-BIPQ items produced weaker models than illness concern and the total Igbo-BIPQ score.
Table 5.11: Sequential multiple regression analysis of BIPQ items predicting BPS

<table>
<thead>
<tr>
<th>Variable</th>
<th>B (95% CI)</th>
<th>SEB</th>
<th>β</th>
<th>R²</th>
<th>Adjusted R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Igbo-BIPQ total score</td>
<td>0.154 (0.110, 0.200)</td>
<td>0.024</td>
<td>0.366**</td>
<td>0.516</td>
<td>0.491</td>
</tr>
<tr>
<td>Consequences</td>
<td>0.314 (0.125, 0.502)</td>
<td>0.095</td>
<td>0.223**</td>
<td>0.444</td>
<td>0.414</td>
</tr>
<tr>
<td>Timeline</td>
<td>0.410 (0.221, 0.600)</td>
<td>0.096</td>
<td>0.255**</td>
<td>0.464</td>
<td>0.435</td>
</tr>
<tr>
<td>Personal Control</td>
<td>-0.322 (-0.500, -0.143)</td>
<td>0.09</td>
<td>-0.205**</td>
<td>0.449</td>
<td>0.420</td>
</tr>
<tr>
<td>Treatment Control</td>
<td>-0.173 (-0.376, 0.030)</td>
<td>0.103</td>
<td>-0.106</td>
<td>0.420</td>
<td>0.390</td>
</tr>
<tr>
<td>Identity</td>
<td>0.222 (0.020, 0.424)</td>
<td>0.103</td>
<td>0.150*</td>
<td>0.426</td>
<td>0.396</td>
</tr>
<tr>
<td>Illness concern</td>
<td>0.437 (0.250, 0.623)</td>
<td>0.095</td>
<td>0.294**</td>
<td>0.471</td>
<td>0.443</td>
</tr>
<tr>
<td>Coherence</td>
<td>0.024 (-0.165, 0.214)</td>
<td>0.096</td>
<td>0.016</td>
<td>0.412</td>
<td>0.381</td>
</tr>
<tr>
<td>Emotional representation</td>
<td>0.220 (0.055, 0.385)</td>
<td>0.084</td>
<td>0.183*</td>
<td>0.433</td>
<td>0.402</td>
</tr>
</tbody>
</table>

**Significant at Bonferroni 0.0063 level (2-tailed); *Significant at 0.05; BPS: Back Performance Scale; BIPQ: Brief Illness Perception Questionnaire; BIPQ1: Consequences; BIPQ2: Timeline; BIPQ3: Personal control; BIPQ4: Treatment control; BIPQ5: Identity; BIPQ6: Illness concern; BIPQ7: Coherence; BIPQ8: Emotional representation

In Table 5.11, each of the eight items of the Igbo-BIPQ were entered as predictors into the sequential multiple regression analysis that predicted BPS for model 2 (Table 5.8), in place of total Igbo-BIPQ score. The total Igbo-BIPQ score is copied from Table 5.8 for comparison with the Igbo-BIPQ items while the other variables from Table 5.8 are not shown in Table 5.11 for brevity. A Bonferroni-adjusted significance level of 0.0063 (8 analyses with each analysis including one Igbo-BIPQ item) was used to account for the increased possibility of type I error. The total Igbo-BIPQ score explained more variance in BPS than any individual item of the Igbo-BIPQ. Illness concern (β=0.294; p<0.0005), timeline (β=0.255; p<0.0005), consequences (β=0.223; p=0.001) and personal control (β = -0.205; p<0.0005) were the significant Igbo-BIPQ items.

Notably, illness concern consistently remained the strongest Igbo-BIPQ item predicting both self-reported (Igbo-RMDQ) and performance-based (BPS) disability.

The ninth Igbo-BIPQ item is open and is not included in the Igbo-BIPQ total scoring. Categorical analysis of the ninth Igbo-BIPQ item was therefore required.
Figure 5.4 shows that most participants attributed CLBP to biomechanical factors, followed by medical factors (e.g. infection). The least attributed factor was spiritual.

Table 5.12: Influence of perceived causal factors (Igbo-BIPQ 9) on self-reported (Igbo-RMDQ) and performance-based (BPS) disability

<table>
<thead>
<tr>
<th>Perceived causal factors</th>
<th>Igbo-RMDQ U (p value)</th>
<th>BPS U (p value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biomechanical</td>
<td>4026.500 (0.571)</td>
<td>4054.500 (0.622)</td>
</tr>
<tr>
<td>Medical</td>
<td>2099.000 (0.186)</td>
<td>2455.000 (0.932)</td>
</tr>
<tr>
<td>Spiritual</td>
<td>294.000 (0.039)</td>
<td>470.500 (0.423)</td>
</tr>
<tr>
<td>Natural/gender</td>
<td>1267.500 (0.869)</td>
<td>688.500 (0.003)</td>
</tr>
<tr>
<td>Don’t know</td>
<td>707.000 (0.030)</td>
<td>612.500 (0.008)</td>
</tr>
</tbody>
</table>

U: Mann Whitney U

Table 5.12 shows a further analysis of Igbo-BIPQ item 9. Having no attributed cause (don’t know) was significantly associated with both self-reported (Igbo-RMDQ) and performance-based (BPS) disability. Spiritual causal understanding was significantly associated with Igbo-RMDQ while natural/gender factors (belief that back pain was due to inheritance from participant’s family or gender) were significantly associated with BPS.

1= biomechanical factors; 2= medical factors; 3= spiritual factors; 4= natural or gender related factors; 5= do not know
Table 5.13: Influence of main job tasks and job control (Igbo-ORFQ) on self-reported (Igbo-RMDQ) and performance-based (BPS) disability

<table>
<thead>
<tr>
<th></th>
<th>RMDQ (p value)</th>
<th>BPS (p value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main job tasks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Manual or non-</td>
<td>U= 4448.000</td>
<td>U= 4233.500</td>
</tr>
<tr>
<td>manual)</td>
<td>(0.323)</td>
<td>(0.127)</td>
</tr>
<tr>
<td>Job control</td>
<td>r_s= 0.042</td>
<td>r_s= -0.071</td>
</tr>
<tr>
<td></td>
<td>(0.557)</td>
<td>(0.320)</td>
</tr>
</tbody>
</table>

U = Mann Whitney U; r_s = Spearman correlation

Table 5.13 shows that main job tasks and job control were not associated with both Igbo-RMDQ and BPS.

5.4.6 Interaction results

The addition of specific interaction terms was informed by the results of this study. Interaction terms were added for depression as it had a positive univariate association with Igbo-RMDQ (Table 5.4), which changed to a negative association in the regression model (Table 5.7). Therefore, Igbo-HADS (depression subscale) was combined with each independent significant predictor of Igbo-RMDQ. Similarly, interaction terms were added for occupational biomechanical factors which people associated with back pain in the qualitative studies in Chapters two and three (Studies 1 and 2), but which had a negative correlation with Igbo-RMDQ (Table 5.4), and was not a predictor of Igbo-RMDQ (Table 5.7). Furthermore, the male participants who had more biomechanical exposure had greater fear avoidance beliefs (Table 5.3). Therefore, Igbo-ORFQ was combined with each of the significant predictors of Igbo-RMDQ. The only significant interactions in relation to Igbo-RMDQ were between biomechanical factors (Igbo-ORFQ) and social support (Igbo-MSPSS) (p=0.002); and between biomechanical factors (Igbo-ORFQ) and depression (Igbo-HADS) (p=0.031). However, none of the interaction terms were significant in the regression model that predicted Igbo-RMDQ (Appendix 27).
5.4.7 Results of post-hoc diagnostic tests

Graphical and statistical analyses of residuals showed that the regression models that predicted self-reported disability (Igbo-RMDQ) and performance based disability (BPS) were accurate.

RMDQ had Durbin-Watson score of 2.11 which falls within the acceptable range of 1.50 to 2.50 satisfying assumption of independence of residuals. All cook’s distance of points were less than one. All points were from 0.00 to 0.03 except one point that was 0.13. Five cases had standardised residuals greater than 1.96, equivalent to 2.5% of cases. One case had a standardised residual greater than 2.58 which is 0.5% of cases. There was no case with a standardised residual up to 3.29.

Figure 5.5a shows a fairly strong positive linear relationship between observed RMDQ and predicted RMDQ. Figure 5.5b shows a random relationship between RMDQ mean residuals and RMDQ predicted values. Figure 5.5c shows that overall variability of RMDQ standardised residuals is approximately zero. Figure 5.5d shows RMDQ residuals are approximately normal.

Figure 5.5e shows a fairly strong positive linear relationship between observed BPS and predicted BPS. Figure 5.5f shows a random relationship between BPS mean residuals and predicted BPS. Figure 5.5g shows overall variability of BPS standardised residuals is approximately zero. Figure 5.5h shows BPS residuals are approximately normal. Figures 5.5i and 5.5j show good leverage for RMDQ and BPS respectively.
Figure 5.5: Post-hoc diagnostic tests

5.4.8 Post-hoc power estimation

A sample size of 200 at the largest regression effect size found in this study ($f^2 = 0.366$) at $\alpha$ of 0.05 with 12 predictors showed that this study had a 99.9% power to detect predictors of disability.
5.5 Discussion

5.5.1 Summary and interpretation of findings

The most important predictors of CLBP disability in rural Nigeria were illness perceptions and fear avoidance beliefs since they predicted both self-reported and performance based disability. Pain intensity, catastrophising and anxiety were the other predictors of self-reported disability. Social support and female gender were the other factors that predicted performance-based disability. Occupational biomechanical factors did not predict CLBP disability in this study in rural Nigeria.

The results of this study support previous evidence in western developed countries suggesting that illness perceptions are one of the key determinants of self-reported CLBP disability; the second strongest factor being pain self-efficacy (164). Stronger illness perceptions in this study reflected a more threatening view of CLBP (499). Whereas illness concern was the most important dimension of illness perceptions predicting disability in this study; perceived illness timeline, identity and personal control were more important in a UK study (164). Another UK based prospective cohort study found that baseline consequences, timeline, personal and treatment control were associated with CLBP disability in patients receiving treatment in primary care (173). Pooled evidence from 36 countries in North America, Central and South America, Europe, Australasia, and Asia showed that the core cognitive dimensions of illness perceptions: consequences, identity, timeline and control, were the most predictive of clinical outcomes, consistent with the self-regulatory model (SRM) of illness cognitions (170).

The disparities in the dimensions of illness perceptions that were most important in the two populations may be because different illness perception questionnaires and analyses were utilised. For instance, the brief version of the illness perception questionnaire was used in this study whereas the comprehensive version was used in the other studies (164, 173). Additionally, the causal dimension of illness perceptions was analysed categorically and was not involved in the regression analyses in this study but was included in the other studies.
Differences in illness perceptions may also be due to different population characteristics, as none of these studies involved African patients (164, 170, 173). As suggested in the studies in Chapters two (376) and three (Studies 1 and 2), participants in this population may have less clinical information about CLBP; and may have received several specific diagnoses and more promises of cure than their western counterparts. This may have increased illness concern when a resolution of their symptoms was not achieved. In contrast, Western patients are often given non-specific diagnosis, educated about the chronic nature of CLBP and the need for self-management, which in turn may influence illness identity, perceived timeline and personal control respectively.

Importantly, the perceived cause of CLBP is significantly associated with disability, supporting the study by Foster et al. (164). Not knowing the cause of CLBP was associated with increased self-reported and performance based disability in this study. Attributing spiritual factors to CLBP was significantly associated with self-reported but not performance-based disability. Attributing CLBP to hereditary/gender factors was significantly associated with performance-based but not self-reported disability. The causal associations must be interpreted with caution however, due to the pronounced unequal sizes of the causal categories of CLBP (Table 5.12).

As implied in the SRM (169, 179, 181), illness perceptions may have facilitated coping strategies that increased both self-reported and performance-based disability. One such coping strategy is catastrophising, a cognitive coping approach that predicted self-reported but not performance-based disability. The exact mechanisms through which illness perceptions predicted both self-reported and performance-based CLBP disability may therefore require further investigation in future studies.

Foster et al. (164) findings contradict the results of this study with regards to fear avoidance beliefs. When all independent factors associated with disability were included in that study, fear avoidance beliefs, depression and catastrophising became non-significant (164). In that prospective cohort study of over 1000 patients, six tools were used to provide data on 20 psychological constructs, which included twelve constructs of illness perceptions, two constructs (anxiety and depression) of emotional distress, one construct of pain self-efficacy, one construct of fear avoidance, and four constructs of coping strategies (164). One reason for different fear avoidance outcomes could be
because of a lack of pain self-efficacy assessment in this study, although both concepts are believed to overlap to some extent (662).

Pain self-efficacy is the level of confidence a patient has in performing normal tasks in spite of pain (164), and has been shown to be a better determinant of pain related disability than fear avoidance beliefs in primary care patients (164, 662, 663). Increased pain self-efficacy has also been reported to predict lower performance-based disability (664), and has been proposed to act as a mediator of the relationship between pain intensity and CLBP disability (19). Future studies could assess the impact of pain self-efficacy in people with CLBP in rural Nigeria.

Another reason for differences in fear avoidance beliefs outcomes could be different population characteristics. Other studies involved patients recruited from primary or occupational health care in western countries (164, 662, 663), whereas this study recruited rural Nigerian participants from the community. Bolstering the findings from this study, fear avoidance beliefs have been shown to predict pain related disability and activities of daily living in population based samples (154, 665). Similar to these findings among community dwelling adults in rural Nigeria, fear avoidance beliefs are reportedly higher in tertiary care patients (those receiving specialist care) in western developed countries because they are a highly selected group with worse general baseline outcomes than those in primary care patients (663). These patients often have high levels of psychological distress, since most of them have received several failed treatments for CLBP (393). The rural Nigerian community dwelling adults in this study, like other population-based samples (154, 665), are likely to be a mixture of typical primary and tertiary care patients, explaining the significance of fear avoidance beliefs.

Lethem et al. (666) developed the fear avoidance model to explain exaggerated pain experience, with discordance between pain sensation and pain behaviour. Studies have substantiated and refined the fear avoidance model which explains how the fear of pain leads to avoidance of movement and activities (147). Avoidance of anticipated pain provoking situations is followed by disuse and deconditioning, resulting in muscle strength deficits (667), pain and disability (69, 134, 147, 148). These mechanisms may therefore explain the prediction of both self-reported and performance-based CLBP disability by fear avoidance beliefs, similarly reported by other authors (544, 656).
Pain intensity, catastrophising, and anxiety were the other factors that predicted self-reported disability, with depression barely reaching statistical significance, whereas social support and female gender predicted performance-based disability. Pain intensity, catastrophising, anxiety and depression have been previously reported to be clearly associated with self-reported disability in western developed countries (20, 69, 79, 80, 133, 147, 148, 656, 668). The fact that pain intensity, catastrophising, anxiety and depression predicted self-reported disability but not performance-based disability may be due to the fact that performance-based disability assessed actual mobility-related functional capacity, while self-reported disability included life activities that may be more affected by negative emotions. Individuals’ perception of their functional ability is however important as it may reflect how CLBP impacts on quality of daily life (403).

Pain intensity (67, 655, 656), catastrophising (655), anxiety (664) and depression (543, 656) have been shown to have minimal or no association with performance-based disability. Pain intensity was not a significant predictor of performance-based disability probably because pain is a subjective experience, more in line with self-reported disability than with the more objective performance-based disability.

The nearly insignificant association of depression and weak association of anxiety with self-reported disability in this study could be related to poor or divergent understanding of these emotional concepts in this population, as suggested in the studies in Chapters two (376) and four (Studies 1 and 3). Moreover, distress may be better reflected in some of the illness perception dimensions, such as illness concern and emotional representations, shown to be strong predictors of CLBP disability in this study.

Catastrophising has been reported as a predictor (544) and precursor (147, 148) of fear avoidance beliefs, which may explain its stronger association with self-reported disability than fear avoidance beliefs, and lack of association with performance-based disability. Disuse and deconditioning, underlying performance-based disability (669), may be more directly linked to fear avoidance beliefs than catastrophising, pain intensity, anxiety and depression.

However, the evidence linking disuse and deconditioning to CLBP disability is ambiguous. Disuse and deconditioning have been explained in terms of reduced muscle strength, muscle coordination and aerobic fitness (69, 147, 148). As opposed to muscle
strength and muscle coordination which may be masked by submaximal performance due to fear avoidance beliefs, aerobic fitness capacity is regarded as a better assessment of disuse and deconditioning (148). However, reduced muscle strength and muscle coordination but not aerobic fitness, have been clearly associated with CLBP disability (148, 669). This suggests that only some specific activities believed to aggravate pain may be reduced, while general physical activity levels and cardiovascular fitness remain unaffected in CLBP (148, 669). This corroborates the findings in this population suggesting that people with CLBP are physically active despite apparent disability (376).

Social support was associated with lower self-reported disability measured with the Igbo-WHODAS. Evidence suggests that qualitative aspects of perceived social support and quantitative aspects of the size of social networks affect long term functional limitations and pain in chronic pain conditions (670, 671). Increased social support has been associated with less limitation in daily life, less pain behaviours, greater activity levels, adaptive coping and better adjustment to chronic pain (670, 671). Conversely, the positive association of social support with performance-based disability may be because increased social support was a consequence of mobility limitation in this population, as social support often signifies coping assistance (672). It may also be that too much social support is detrimental to mobility. The social aspect of the biopsychosocial model of CLBP has received the least attention in other studies, which has adverse implications for low-income and socially deprived patients (673).

Education was negatively correlated with disability. Lower educational level has been associated with long term increases in pain intensity (670), and longer duration/higher recurrence of LBP (674). Possible reasons for the negative association between education and disability include variations in behavioural and environmental risk factors by educational status, such as occupational factors, health status, access to and utilisation of health services, and adaptation to stress (674).

Occupational biomechanical factors were negatively associated with self-reported disability, although this became non-significant with Bonferroni correction. This contradicts the reports in the qualitative studies (Studies 1 and 2) in Chapters two and three, suggesting that biomechanical factors such as heavy lifting and prolonged bending aggravated CLBP. As almost all participants were involved in manually driven
jobs including farming, it is possible that higher exposure to occupational biomechanical factors may have highlighted participants still at work despite their CLBP, whereas low exposure to biomechanical factors may represent participants who were no longer at work or left their jobs due to CLBP. This supports the findings in Chapter two suggesting that some individuals left or changed their jobs due to CLBP. This finding may be related to the “healthy worker” effect where healthy workers were more likely to remain in heavy jobs and less healthy workers more likely to leave heavy jobs (96). This may mask the association between biomechanical factors and CLBP disability. Alternatively, participants may have perceived biomechanical factors to be more important than they actually are. Greater exposure to biomechanical factors such as lifting, bending, twisting, digging or shovelling, has been associated with poor return to work outcomes in one prospective study (65). However, the disability measures used in the multiple regression analyses in this study did not capture work-related outcomes. Although being at work may be associated with less disability (9, 675-678), it may not always reflect true disability levels due to variability of work status (679, 680).

Biomechanical factors have been linked to fear avoidance beliefs (147, 570). Occupational biomechanical exposure and fear avoidance beliefs were higher in the males. Studies have also reported higher fear avoidance beliefs in men (544). High physical work load combined with fear avoidance beliefs may be associated with hypervigilance, and anticipation of pain during work-related activities (147, 570, 571), which may in turn lead to muscle guarding and co-contraction, increasing pain and CLBP disability (147, 285). This may explain some of the qualitative reports of the adverse effects of occupational biomechanical factors in this population (376). Occupational organisational factors such as work pressure and stress were not associated with self-reported and performance-based disability in this study in rural Nigeria, in accord with the literature (138, 140, 141).

There were clear gender differences in outcomes, as females had higher scores with regard to disability and most biopsychosocial factors. Gender differences in nociceptive pain sensitivity have been reported (221). Women may have lower pain thresholds and tolerance, experience greater pain unpleasantness, have different analgesic sensitivity and are over-represented among people seeking pain treatment (681). Female gender
has been associated with more pain of sensory-affective nature (682), alleged to be due to age-related hormonal changes of puberty and menopause involving oestrogen (681).

A greater variance in self-reported disability compared to performance-based disability was explained by the included biopsychosocial factors. Biomedical anthropometric variables such as body composition (683), body mass index (546, 684), fat mass (655, 685) and muscle strength (686), are associated with performance based CLBP disability, also reported in a Nigerian population (26). These factors were not measured in this study, and have been more associated with females (655, 685). This may explain why female gender was a significant predictor of performance-based disability, and why females had higher performance-based disability in this study in rural Nigeria.

The self-reported disability in this population is comparable with RMDQ scores in western countries (65, 163, 210, 564, 656, 687, 688). Performance-based disability in this population is similar to the BPS scores in Norwegian (545) and urban Nigerian (508) populations with CLBP. However, the self-reported disability in this study was higher than the RMDQ scores in urban Nigerian populations (67, 508), suggesting a significantly higher burden in rural Nigeria.

### 5.5.2 Strengths and limitations

This is the first cross-sectional study of the biopsychosocial factors associated with CLBP disability in rural Nigeria. One strength of this study is the recruitment of inaccessible rural populations with CLBP. The simultaneous investigation of the association of psychosocial and biomechanical factors with both self-reported and performance-based disability is another strength of this study. The impact of multiple testing was ameliorated via Bonferroni corrections. Rigorous sampling and data collection methods ensured a sample that is representative of rural populations in Enugu State.

However, the extent to which this sample is representative of the wider rural populations in Nigeria is uncertain. The cross-sectional design of this study constrains the establishment of temporal relationships between the investigated biopsychosocial factors and CLBP disability. There may be some problem due to recall or self-
presentation bias with some self-report measures that may have influenced results. However, self-report measures have been validated for CLBP research. The total scoring of the Igbo-ORFQ rather than using individual items, and its use in a CLBP population rather than for predicting first onset LBP are potential limitations. However, the CLBP literature supports its use in this way (Chapter 4, section 4.3.3).

It is also possible that the involvement of ten different CHWs to collect data may have added some bias that was not detected, even though stringent efforts were made to counteract this via training and supervision. Nevertheless, the use of CHWs enabled the collection of a large data set that would have been impossible for the researcher to collect on her own. This facilitated the robust results presented in this chapter.

Relationships between variables are often more complex than simple bivariate relations between an independent and a dependent variable in the presence of three or more variables (689, 690). For instance, a confounding variable is associated with both the independent and dependent variables, and when ignored, leads to a wrong inference about the relationship between the dependent and independent variables (691, 692). Another relationship is the covariate variable, which is related to the independent and/or the dependent variable, and improves the prediction of the dependent variable by the independent variable, but does not significantly change the relationship between these variables when accounted for (691). In this study, attempts were made to account for possible confounding and covariate variables by including the socio-demographic variables in the first model of the sequential multiple regression analyses.

A moderator modifies the relationship between the dependent and independent variables such that their relationship differs at different values of the moderator (691, 692). Attempts were made to investigate moderation via interaction effects in this study. However, the sample size may have been too small to detect significant tests of interaction. Moreover, the cross-sectional design of this study implies that any interaction effects could not be confirmed as causal because causal interaction effect requires a causal theory and study design behind the data (693).

A fourth relationship occurs via mediating variables which transmit the effects of an independent variable on a dependent variable and whose influence aid in understanding psychological theories and mechanisms by which one variable affects another (691,
Mediation analyses was not investigated in this study and could have been used to test the theoretical underpinning of this study and determine if some biopsychosocial factors mediated the relationships between other biopsychosocial factors and disability. For instance, according to the self-regulatory model of illness cognitions, one of the theoretical underpinnings of this thesis, coping strategies would mediate the relationships between maladaptive back pain beliefs and disability. Mediation could be complete, in which case the total effect is completely explained by the mediator, such that there is no direct effect (691, 693), or partial, such that the relationship between the independent and the outcome variable is not completely accounted for by the mediating variable (692). Importantly, a mediator should be responsive to change theoretically and conceptually (693). Although detection of mediation could have been attempted with hierarchical multiple regression, this would have required repeated multiple regression analyses due to non-simultaneous estimation of parameters in multiple regression, which could bias mediated effects and their standard errors (694). Moreover, model misspecification is a limitation of multiple regression because there are no overall goodness of fit indices and the R² does not indicate the overall fit between data and theory (694). Detection of mediators using multiple regression does not account for inherent measurement error in independent variables, and there are no established guidelines for adding and deleting model variables (694).

In contrast to multiple regression analysis, structural equation modelling (SEM) is a combination of factor (often confirmatory) analysis and regression/path analysis, and is widely used for understanding theoretical constructs (695). SEM goes beyond ordinary regression models to incorporate multiple independent and dependent variables, integrating many regression equations concurrently (689). SEM investigates direct and indirect effects, as well as hypothetical latent constructs that clusters of observed variables might represent, thereby providing a way to test the specified set of relationships among observed and latent variables, and allowing theory testing even when experiments are not possible (696, 697). SEM can enable the investigation of the causal models of mediation and moderation effects from correlational data (693). Although both SEM and multiple regression analysis can be represented as a path model, a series of multiple regression analyses would be needed to create a path model, and cannot be tested (695). In contrast, SEM can estimate the fit of each construct and each
of its items, overall model fit, and explicitly account for measurement error in variables which can be modelled to improve parameter estimates (695-697).

Path diagrams are pictorial representations of associations whereas path analysis is a special type of SEM containing only observed variables denoted with path diagrams (696, 697). Path diagrams consist of boxes (signifying measured or observed variables) and circles (representing latent or unobserved variables) connected by arrows (695). Single headed arrows or ‘paths’ define causal relationships in the model with the variable at the tail of the arrow causing the variable at the point and are denoted by regression coefficients. In SEM, relationships between theoretical constructs are signified by regression or path coefficients between the factors (695). Double headed arrows signify covariances or correlations, without a causal interpretation (695). In path analysis, each variable only has one indicator and assumes that all measurements are done without error, whereas SEM uses latent variables to account for measurement error (694, 695). Modification indices can be used in SEM to add or delete paths to obtain the best model fit that can be theoretically meaningful (694, 695). When measurement error and multicollinearity are minimal, path analysis and multiple regression may produce identical results, although several regression analyses may be required (694). However, additional significant paths or previously significant paths in multiple regression analyses may become non-significant in path analysis when assumptions of multiple regression are not strictly met which impacts on theory testing. Including a measurement model for the key variables reduces the impact of unreliability of scales calculated for sets of items impacting on parameter estimates, and is a key advantage of SEM (694).

As mediation and moderation can exist together, another strength of SEM is that it can be used to concurrently investigate these, although SEM with longitudinal data provide the best causal inferences (691, 692). In moderation of a mediation effect, the mediated effect is different at different levels of the moderator, whereas mediation of a moderation effect occurs where the effect of an interaction on a dependent variable is mediated (692). However, identifying true moderating and mediating variables requires a programme of research with information from many sources and can be associated with considerable conceptual and statistical challenges (692). Mediation analysis assumes correct causal ordering of the variables and no reverse causality effects (692).
SEM is not without other limitations being a very complex analysis incorporating both latent factors and observed variables with either directed or undirected paths among them (695). SEM is a large sample technique (696). However, there are problems with sample sizes based on the rule of thumb which may grossly over-or underestimate sample size requirements (698). Model characteristics such as the level of communality across the variables and degree of factor determinacy all affect the accuracy of parameter estimates and model fit statistics, implying the tremendous variability of sample size requirements (698). Increased bias of parameter estimates (standard errors), large missing data, and small factor loadings (reduced reliability) increase sample size requirement (698).

Before SEM is started, a model is specified guided by theory and significant previous research (695). After specifying a model, factor loadings and covariances are then estimated using various statistical procedures some of which produce equivocal results (695). For instance, the Chi-square, statistically used to determine how well the hypothesized model fits the data, almost always rejects the model when large samples are used and accepts the model when sample sizes are small and lack statistical power to discriminate between good fitting models and poor fitting models (699). Additionally, the Chi-square test assumes multivariate normality and severe deviations from normality may result in model rejections even when the model is properly specified (699). Consequently, alternative indices for assessing model fit such as root mean square error of approximation (RMSEA), standardised root mean square residual (SRMR), comparative fit index (CFI) and a parsimony fit index would also need to be included (699).

Although fit indices are a useful guide, SEM should be underpinned by theory and significant research, therefore the model fit should not drive the research process to avoid moving away from the theory-testing function of SEM (699). Moreover, the corroboration of a SEM model by a data set means that the model has not been falsified but does not imply that the model has been proven true since there may be competing models (695). Consequently, comparison of several competing models is more convincing than testing and failing to reject only one model (695). However, how the model that best represents the data reflects underlying theory, and thresholds for determining model fit appears to be a matter of debate among researchers (699).
Another limitation of SEM is the causal interpretation of results (695) which may be true in few instances of non-experimental data. However, SEM of experimental data (due to randomisation) remains the best method of establishing causal relationships (695). Establishing causal relationships is possible with SEM of longitudinal data because the observation of the independent variable precedes the observation of the dependent variable (693).

SEM would have provided clear benefits over the multiple regression analyses used in this chapter. However, the cross-sectional design of this study would have limited the interpretation of any mediation and moderation analyses done with SEM due to equivalent models problem associated with cross-sectional data.

### 5.5.3 Implications for clinical practice and future research

There needs to be a paradigm shift in the management of CLBP in rural Nigeria to acknowledge psychosocial factors, particularly illness perceptions and fear avoidance beliefs. This could be achieved through training curriculums based on a biopsychosocial model. Longitudinal research is required in rural Nigeria to rule out the “healthy worker” effect and clarify the role of biomechanical factors on CLBP disability. Future studies employing superior designs such as prospective and experimental designs should clarify the mechanisms through which illness perceptions predict both self-reported and performance-based disability.

### 5.6 Conclusions

This is the first population-based survey that concurrently investigated the association of psychosocial and biomechanical factors, with both self-reported and performance-based CLBP disability. Findings suggest that psychosocial factors are more important than biomechanical factors in CLBP disability in rural Nigeria. This is at odds with current CLBP management in this context, which is based on a biomedical model (Study 2 – Chapter 3).
The next chapter will describe a systematic review conducted to identify any potential behaviour change intervention components that might improve physical activity (including exercises) in people with chronic non-communicable diseases in Africa. This will then be used when developing an exercise-based intervention designed to reduce CLBP-related disability in rural Nigeria.
6 Behaviour change intervention components for improving physical activity in people with chronic non-communicable diseases in Africa: A systematic mixed-studies review

6.1 Chapter summary

This chapter presents a systematic review with a published protocol, conducted to identify the behaviour change intervention components for improving physical activity in people with chronic non-communicable diseases (NCDs) in Africa. The background section (6.2) provides the justification for conducting this study, followed by the methods (section 6.3) that describes the search strategies, qualitative and quantitative data syntheses. This is followed by the results section (6.4), and then the discussion (section 6.5) that explores the implications of the results.

Moderate quality evidence suggests that behavioural rehearsal/practice, habit formation, and restructuring the physical and social environment may contribute to long term physical activity behaviour. Low quality evidence suggests that providing information about health consequences may support short-term physical activity behaviour in Africa. However, many identified intervention components have not been fully explored or tested. There was no study of any type on chronic pain in Africa.
6.2 Introduction

6.2.1 Background

African countries account for a significant proportion of the global mortality and morbidity from chronic non-communicable diseases (NCDs) (700, 701). The most common chronic NCDs include cardiovascular diseases, diabetes, cancers and chronic respiratory diseases (701). There are reports of a relationship between NCDs, and bone and joint disorders (702). Obesity is a common risk factor for NCDs, and a multifactorial link exists between obesity and chronic pain including genetic, metabolic, psychological and mechanical factors (703-705). Additionally, chronic pain and exercise incapacity are often associated with NCDs (706).

African patients are more likely to have more than one chronic condition such as chronic pain, hypertension and diabetes at a given time (62, 376, 707, 708). Moreover, people with back pain may have a greater risk of dying from cardiovascular diseases, and a greater overall mortality rate (2). These underscore the necessity of interventions that are effective across these conditions in Africa.

Evidence-based clinical practice guidelines for the treatment of NCDs recommend physical activity to improve physiological, cognitive, emotional, social and psychosocial functioning, alter health beliefs, increase acceptance of chronic disease (709-713), and reduce chronic pain and disability (259, 261). According to the World Health Organization (714), chronic health conditions require ongoing management over years or decades, and require a coordinated health care model centred on patients’ needs, values and preferences, to facilitate self-management skills and behaviour change.

Behaviour-change interventions are coordinated sets of activities designed to change particular behaviours (715). These interventions are often complex comprising many interacting components (356, 357). Behaviour patterns are deeply embedded in people’s cultural, social and economic characteristics (298), and are hence controlled by intrapsychic and external factors (715).
Given the predominant biomedical and acute infective healthcare model in Africa (453), as reported in rural Nigeria (376, 708), the acceptability and effectiveness of behaviour change interventions to facilitate the uptake of physical activity may be limited (376). In order to develop such behaviour-change interventions for chronic NCDs in Africa, there is a need to identify strategies and components that could optimise acceptability and enhance effectiveness in this context, as these may be influenced by contextual factors irrespective of the chronic condition (716). Moreover, the focus of behaviour change interventions should be on the targeted behaviour (715).

The components of a behaviour change intervention refer to the techniques which constitute the active ingredients of the intervention, and the procedures used to deliver those techniques (357). Behaviour change techniques (BCTs) are replicable components of an intervention designed to alter or redirect causal processes that regulate behaviour, with minimum delivery specifications that allow their identification (357). Procedures include: who delivers the intervention, to whom, how often, for how long, in what format, and in what context (357, 717). BCTs are useful both for identifying and standardising the reporting of complex interventions. They facilitate the secondary analyses of interventions in primary studies by synthesising heterogeneous interventions to determine which component techniques are effective to allow replication (357, 718). BCTs aid in the theoretical understanding of complex interventions enabling identification of the mechanisms of action through which effective outcomes are achieved (718, 719), by linking intervention techniques with theoretical constructs and theories of behaviour change (720).

Five self-regulation BCTs derived from the control theory were effective in improving physical activity, and reducing obesity and risk of cardiovascular disease in a meta-regression of clinical trials conducted in mostly developed countries (721). The BCTs included prompt intention or goal setting, specifying goals in relation to particular contextualized actions, self-monitoring of behaviour, feedback on performance, and review of previously set goals. Self-monitoring was the most important of these BCTs (721). However, only 26
BCTs were used to describe the interventions in the review (721). Therefore, the present systematic review utilised the comprehensive taxonomy of 93 BCTs (356) to specify the BCTs in the included primary studies, and is reported according to the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) statement (722). This review combined findings from experimental/quasi-experimental and qualitative studies, in line with the Medical Research Council’s guidance on the process evaluation of complex interventions (723).

6.2.2 Aims of the research

1. Assess the effectiveness of physical activity related interventions in enhancing (a) biomedical and psychosocial outcomes and (b) physical activity behaviour.
2. Explore the experiences and perspectives of individuals to these interventions in Africa.
3. Identify behaviour change intervention components for improving physical activity in adults with common chronic NCDs in Africa.

6.3 Methods

6.3.1 Search strategy and selection criteria

This systematic review was registered with the International Prospective Register of Systematic Reviews (PROSPERO 2015: CRD42015016084), and has a comprehensive published protocol (724), in line with best practice guidelines (725, 726). Following the PRISMA guidelines (722), relevant bibliographic databases were searched: MEDLINE, EMBASE, PsycINFO, CENTRAL, CINAHL, Web of Science, African Index Medicus (AIM), and AFROLIB (WHO’s regional office database for Africa), all from inception until 18 July 2015. A combination of Medical Subject Headings, free text terms and word variants
for hypertension, diabetes, obesity and all chronic musculoskeletal conditions, African search filter (727), word variants for physical activity related therapies, and the search filters for three study types - clinical trials, qualitative and observational studies, were used. Details of the search strategies are in the published protocol (724) (Appendix 28). For grey literature, trials registers, directory of open-access repository websites, Web of Science Conference Proceedings and WorldCat Dissertations and theses were searched. Experts in Africa were contacted for other potential sources of information.

There was no restriction by language or intervention settings. Studies were selected if they involved adult (≥18 years), African individuals living in Africa with NCDs, such as hypertension, diabetes, obesity or chronic musculoskeletal pain. Interventions included any physical activity management strategy. Interventions could be complex comprising other components such as medications, nutrition, health education, psychological interventions, social interventions, and any form of patient support to facilitate behaviour change. There were no restrictions on study design (experimental, observational and qualitative); comparators and timing. Experimental/quasi-experimental studies were included if they investigated the effectiveness of these interventions on biomedical, psychosocial and/or physical activity outcomes. Qualitative and observational studies were included if they explored the experiences and perspectives of individuals to these interventions. The primary outcome was physical activity related behaviour change. Other biomedical and psychological constructs were assessed as secondary outcomes. Studies of African patients not living in Africa, studies without a physical activity component or any primary data, and duplicate publications were excluded. Studies were selected in two stages. In the first stage, the researcher screened titles and abstracts using the inclusion and exclusion criteria to identify potentially relevant articles, cross-checked independently by supervisors (ELG, APK and IOS). In the second stage, screening of full articles was done independently by the researcher and supervisors (ELG and IOS). Disagreements were resolved by consultation with APK. Further details of the selection criteria are in the published review protocol (724). The flow chart outlining the study selection process is shown in Figure 6.1 below.
6.3.2 Data extraction and quality assessment

Data extraction and quality assessment was completed by the researcher, and cross-checked independently by supervisors (ELG and IOS). Disagreements were resolved by consultation with APK. Quantitative data were extracted from experimental/quasi-experimental studies using an adaptation of the Cochrane Consumers and Communication Review Group’s Data Extraction Template for Cochrane Reviews (728). Data from the qualitative studies were extracted using an adaptation of the Supplementary Guidance for Inclusion of Qualitative Research in Cochrane Systematic Reviews of Interventions (729). The data collected included the country where the study was conducted, year of publication, language of publication, participants’ characteristics, sample size, targeted chronic condition, study design, intervention description, follow-up period, the drop-out rate, outcome(s) measured, methods for ascertaining/measuring the outcome(s), funding sources, results, and components of the interventions as defined by experts (356). This included BCTs, and procedures such as the context within which the intervention was administered, who delivered the intervention, to whom, how often, the length of the intervention and the format. Intervention descriptions were recorded as described by primary authors, and subsequently coded with the taxonomy of 93 hierarchically clustered BCTs (356), using the definition of Michie et al. (357) and Whitlock et al. (717). Consensus agreement in coding was achieved via group discussion of the multidisciplinary review team as recommended by guidelines (718, 730, 731).

The quality of all included studies was assessed with the Mixed Methods Appraisal Tool (MMAT), allowing concurrent appraisal of experimental/quasi-experimental and qualitative research designs (732, 733), with good efficiency and reliability (734). The risk of bias in experimental/quasi-experimental studies was assessed with the Cochrane Collaboration’s risk of bias tool including sequence generation, allocation concealment, blinding, completeness of outcome data, possibility of selective outcome reporting and other potential threats to validity (735). Experimental/quasi-experimental studies were rated as ‘high risk’, ‘low risk’ or ‘unclear’ (736).
6.3.3 Data analyses

A four stage analyses were carried out using a mixed-studies synthesis design: the sequential explanatory synthesis (732). In the first stage, the effectiveness of physical activity related interventions in improving biomedical and/or psychosocial outcomes was determined by reviewing experimental/quasi-experimental studies that assessed these outcomes. The effectiveness of these interventions on biomedical/psychosocial outcomes would justify the need to target behaviour change to maintain these effects. During the second stage, experimental/quasi-experimental studies with interventions that specifically considered the primary outcome of this review - physical activity related behaviour changes, were reviewed to assess the effectiveness of the interventions for improving physical activity behaviour. The third stage of the review utilised qualitative studies to identify intervention components that enhanced the acceptability of these interventions by exploring the experiences/perspectives of individuals to these interventions in Africa. It was planned to analyse observational studies descriptively to add to the qualitative findings. Lastly, during the final stage, a comparative analysis of the findings from experimental/quasi-experimental and qualitative studies was completed to assess which acceptable behaviour change intervention components improved physical activity behaviour in Africa.

6.3.3.1 Quantitative analyses

There was clinical and methodological heterogeneity in the experimental/quasi-experimental studies which precluded meta-analysis. There was varied intervention content and objectives, study designs, study quality, chronic condition, sample size, gender, age, outcomes and contexts. Experimental/quasi-experimental studies’ results were therefore summarised using narrative synthesis in two stages as previously described. The overall quality and strength of the evidence from experimental/quasi-experimental studies was judged by the Grading of Recommendations Assessment,
Development and Evaluation (GRADE) approach, across the domains of risk of bias, consistency, directness, precision and publication bias (737).

6.3.3.2 Qualitative analysis

The third stage of this review involved thematic synthesis of findings from the qualitative studies and qualitative aspect of mixed-methods studies, using NVivo version 10 software (QSR international, Melbourne, Australia). Thematic synthesis is an epistemological position that fits with the aims of this review (738), because it answers questions relating to intervention need, appropriateness, acceptability and effectiveness without compromising on key principles of systematic reviews (739). Descriptive line-by-line coding was used to generate categories (740). Categories were then organised into related areas to construct descriptive themes. Finally, higher order analytical themes were developed through interpretation and abstraction of descriptive themes. Each stage of the qualitative synthesis was validated by the review team comparing generated categories/themes with primary results.

6.3.3.3 Comparative analysis of quantitative and qualitative results

The fourth stage of the review involved using the qualitative findings to interrogate the results from the experimental/quasi-experimental studies, as was done in two previous reviews with similar designs and aims (741, 742). It could not be determined a priori what the results of the qualitative synthesis would be, therefore interventions in the experimental/quasi-experimental studies were explored to locate the behaviour change intervention components found acceptable in the qualitative studies. Comparative analysis was guided by three questions: Did interventions contain acceptable behaviour change intervention components? Which acceptable behaviour change intervention components have not been evaluated in a clinical trial? Do interventions with acceptable behaviour change intervention components have better physical activity related behaviour change outcomes?
6.4 Results

6.4.1 Overview of the searches

The initial search yielded 32,497 articles (Figure 6.1). After duplicate removal, 2,003 titles and abstracts were screened. 1,893 studies involving African American patients and patients of African descent living in other developed countries were excluded. Full texts of the remaining 110 articles were assessed for eligibility. 85 articles which did not have interventions with a physical activity related component were excluded. Of the remaining 25 articles, 15 qualitative and quantitative observational studies that involved patients who did not receive physical activity related interventions were excluded. One additional clinical trial was identified from a researcher in Nigeria resulting in a total of 11 articles. There were 9 experimental/quasi-experimental studies (5 RCTs and 4 non-RCTs), and 2 qualitative studies (Figure 6.1). One quasi-experimental study used a mixed-methods design including a qualitative arm, and therefore contributed to the number of both experimental/quasi-experimental and qualitative studies (Tables 6.1 and 6.3).
Potential articles identified $n=32,497$
Medline = 4,939  
EMBASE = 12,504  
PsycINFO = 4,452  
CINAHLL (Ebsco) = 667  
Cochrane (CENTRAL) = 1,970  
Web of Science = 7,936  
African databases = 12  
Grey literature = 17

Duplicates excluded $n=30,494$

Abstracts screened $n=2,003$
Abstracts excluded $n=1,893$

Full text articles assessed $n=110$
Full text articles excluded $n=100$

Articles included $n=10$
Further clinical trial identified from a Nigerian based author $n=1$

Experimental/quasi-experimental studies
RCTs, $n=5$
Non-RCTs, $n=4$

Qualitative studies $n=2$

Reasons for exclusion:
1. Population: African Americans or African ethnic minority groups in developed countries
2. a. Intervention: No exercise or physical activity content
2. b. Qualitative and quantitative observational studies that did not directly assess experiences/perspectives to physical activity related interventions

Figure 6.1: Flow diagram of the selection process of studies
6.4.2 Overview of included studies

The methodological quality of studies, characteristics of experimental/quasi-experimental and qualitative studies, and intervention components are depicted in Tables 6.1 to 6.3. Intervention description given by primary authors is shown in Appendix 29. Identified studies were published between 2004 and 2014 from South Africa (7 studies), Nigeria (3 studies) and Reunion (1 study). The total number of participants across the included studies was 1,210 adults with common NCDs in Africa, and ranged between 13 to 398 participants in individual studies. The proportion of women ranged from 0% to 100%. Settings included rural (n=2), urban (n=8) and mixed rural and urban (n=1) African settings (Tables 6.1 and 6.3). Two RCTs were duplicate publications (743, 744), hence the most comprehensive RCT (743) was used incorporating the results of the duplicate publication (Appendix 29). Five RCTs (743, 745-748) were assessed as low risk for blinding of participants and personnel, incomplete outcome data and selective reporting. There was no risk of bias in all domains in two RCTs (747, 748). There was unclear blinding of outcome assessment in one RCT (746). Random sequence generation, allocation concealment and blinding of outcome assessment were unclear in the remaining two RCTs (743, 745). Four non-controlled before-and-after (B/A) studies (749-752) were assessed as high risk for random sequence generation, allocation concealment and blinding of outcome assessment, but low risk for incomplete outcome data and selective reporting.

6.4.3 Interventions and outcomes assessed in studies

Three experimental/quasi-experimental studies including one RCT and two B/A studies (746, 750, 752), assessed the primary outcome of this review. General physical activity related behaviour change was assessed by: a questionnaire that measured frequency of sitting, standing, walking, lifting heavy loads and sweating during activity (746); internationally validated diabetes self-care activities questionnaire (750); number of steps taken per day (752). Sports activity was assessed by combining intensity (MJ/h), time spent each week (h/week), and perseverance (months/year) (746). The latter was
also used to assess leisure physical activity including walking, cycling and gardening (746).

Eight experimental/quasi-experimental studies measured biomedical outcomes, with the majority focusing only on outcomes such as diastolic and systolic blood pressure, blood glucose, body mass index (BMI), glycated haemoglobin, aerobic capacity, waist and hip circumference, heart rate, cholesterol, serum uric acid, 6 minutes’ walk (6min) and rating of perceived exertion. One B/A study only assessed behavioural outcomes (750) (Table 6.1). One B/A study (752) and one RCT (746) assessed attendance rate for a physical activity intervention (Table 6.1). One RCT (746) only assessed long-term (≥1 year) outcomes; one RCT (747) assessed both short (< 1 year) and long-term outcomes, while the remaining seven studies only assessed short-term outcomes (Appendix 29).

Eight experimental/quasi-experimental studies compared physical activity related interventions with usual care, while the ninth study (RCT) (748) compared this intervention to education and relaxation. Three studies assessed the effects of physical activity alone, consisting of actual performance of aerobic exercises (743, 745, 749). Three studies investigated the effects of interventions just comprising interactive educational sessions about exercises/physical activity (746, 750, 751). One RCT combined educational sessions with pedometers and shoe insoles to facilitate walking (747). One study combined psychoeducational sessions about nutrition and physical activity, with mobile phone-based peer support (752). The intervention in the remaining RCT (748) combined educational sessions about exercises with the actual performance of aerobic exercises. Only two studies had interventions that were theory based: the skilled-helper model (747) and the power-to-prevent programme (752) (Appendix 29). Seven experimental/quasi-experimental studies had patients with diabetes mellitus, one RCT involved patients with hypertension (743) and one B/A study included individuals with obesity (749). There was no identified study on any type of chronic pain (Table 6.1).

Intervention components identified in the experimental/quasi-experimental studies are listed in Table 6.2. A total of 21 BCTs were identified. Intervention providers included peers (752), instructors (749), educators (746), health promoters (750), dieticians (746, 750), nurses (746), exercise physiologists (746), pharmacists (751), physiotherapists
(743, 745, 747, 748), and a medical doctor (750). The duration of interventions ranged between 4 weeks and 9 months. Intervention frequency ranged from once every 3 months to 3 times every week. Session duration was most commonly one hour, although this was not specified in most trials. Interventions were delivered in settings including primary health care centres (750-752), tertiary hospitals (743, 745-748) and the laboratory (749) (Table 6.2).

One qualitative study (753) and one mixed-methods quasi-experimental study with a qualitative arm (750) explored the experiences and perspectives of patients after participating in physical activity-related interventions in African settings (Table 6.3).
Table 6.1: Characteristics of the experimental/quasi-experimental studies

<table>
<thead>
<tr>
<th>Authors</th>
<th>Country</th>
<th>Study design</th>
<th>Chronic condition</th>
<th>Sample size</th>
<th>Gender</th>
<th>Age (years)</th>
<th>Socio-economic status</th>
<th>Outcomes measured</th>
<th>Scales and methods of measurement</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debussche et al. (746)</td>
<td>Reunion Island</td>
<td>RCT</td>
<td>T2DM</td>
<td>I=206</td>
<td>Female</td>
<td>Range: ≤ 18</td>
<td>Mixed</td>
<td>Primary: HbA1c (by HPLC). Secondary: BMI, Waist circumference, Fat mass, SBP, DBP, Current treatment, Diet, Physical activity, Fasting blood glucose, Lipid profile: plasma total, cholesterol, high density lipoprotein (HDL) cholesterol, triglycerides, attendance rate</td>
<td>Continuous (ratio, ordinal) and Physical measurement</td>
<td>Urban</td>
</tr>
<tr>
<td>van der Does and Mash (750)</td>
<td>South Africa</td>
<td>Mixed methods (Non-controllable B/A and QUAL)</td>
<td>T2DM</td>
<td>I=84</td>
<td>Female</td>
<td>Mean: 51.6</td>
<td>Low</td>
<td>Diet (general), diet (specific), physical activity, foot care, medication adherence, ability to teach others</td>
<td>Ordinal (analysed as continuous) and Binary</td>
<td>Rural</td>
</tr>
<tr>
<td>Rotheram-Borus et al. (752)</td>
<td>South Africa</td>
<td>Non-controllable B/A</td>
<td>T2DM*</td>
<td>I=22</td>
<td>Female</td>
<td>Range: 21-74</td>
<td>Low</td>
<td>Primary: uptake of text messaging, attendance at small group meetings, perceived quality of the intervention and acceptability of a mobile phone-based peer support intervention. Secondary: Average blood glucose level, BMI, SBP, DBP, Emotional distress, coping, weekly exercise and the number of steps taken daily</td>
<td>Continuous (ratio, ordinal) and frequencies and Physical measurement</td>
<td>Urban</td>
</tr>
<tr>
<td>Authors</td>
<td>Country</td>
<td>Study design</td>
<td>Study Quality MMAT</td>
<td>Chronic condition</td>
<td>Sample size</td>
<td>Gender</td>
<td>Age (years)</td>
<td>Socio-economic status</td>
<td>Outcomes measured</td>
<td>Scales and methods of measurement</td>
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</tr>
<tr>
<td>Mathunjwa et al.</td>
<td>South Africa</td>
<td>Non-controll ed B/A</td>
<td>**** Obesity</td>
<td>I= 60</td>
<td>Female = 100%</td>
<td>Mean: 25</td>
<td>Mixed</td>
<td>Weight, BMI, Waist circumference, Hip circumference, SS, (RHR), Glucose, Low density lipoproteins (LDL), High density lipoproteins (HDL), Triglyceride (TG), Total cholesterol (TC), Total cholesterol/high density lipoprotein, SBP, DBP</td>
<td>Continuous (ratio)</td>
<td>Urban</td>
</tr>
<tr>
<td>Ezema et al.</td>
<td>Nigeria</td>
<td>RCT</td>
<td>** T2DM</td>
<td>I= 30 C= 24</td>
<td>Female =50%</td>
<td>Range: 40 - 55; Mean I= 47.53 Mean C= 47.13.</td>
<td>Mixed</td>
<td>SBP, DBP, VO2 max, FBS</td>
<td>Continuous (ratio)</td>
<td>Physical measurements</td>
</tr>
<tr>
<td>Bello et al.</td>
<td>Nigeria</td>
<td>Non-controll ed B/A</td>
<td>*** T2DM</td>
<td>I= 170</td>
<td>Female = 46%</td>
<td>Range: 29-75; Mean: 56.7</td>
<td>Mixed</td>
<td>BMI, HbA1c, Fasting blood sugar (FBS), SBP, DBP</td>
<td>Continuous (ratio)</td>
<td>Physical measurements</td>
</tr>
<tr>
<td>Lamina and Okoye</td>
<td>Nigeria</td>
<td>RCT</td>
<td>*** HBP</td>
<td>I=112 C=105</td>
<td>Male=100%</td>
<td>Range: 50-70; Mean I= 58.6 Mean C= 58.3</td>
<td>Mixed</td>
<td>SBP, DBP, VO2 max, SUA, TC, Psychosocial status</td>
<td>Continuous (ratio, ordinal) Physical measurements</td>
<td>Questionnaire</td>
</tr>
<tr>
<td>Authors</td>
<td>Country</td>
<td>Study design</td>
<td>Study Quality MMAT</td>
<td>Chronic condition</td>
<td>Sample size</td>
<td>Gender</td>
<td>Age (years)</td>
<td>Socio-economic status</td>
<td>Outcomes measured</td>
<td>Scales and methods of measurement</td>
</tr>
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</tr>
<tr>
<td>Van Rooijen et al. (747)</td>
<td>South Africa</td>
<td>RCT</td>
<td>****</td>
<td>T2DM</td>
<td>I=23 C=20</td>
<td>Female = 62.8%</td>
<td>Range: 40-65</td>
<td>Mean I=53.7 Mean C=54.0</td>
<td>Low</td>
<td>Primary: HbA1c Secondary: Blood lipid values, BMI, Diabetes knowledge</td>
</tr>
<tr>
<td>van Rooijen et al. (748)</td>
<td>South Africa</td>
<td>RCT</td>
<td>****</td>
<td>T2DM</td>
<td>I=75 C=74</td>
<td>Female = 100%</td>
<td>Range: 40-65 years; Mean I: 54 Mean C: 55</td>
<td>Low</td>
<td>Primary: HbA1c Secondary: BMI, SBP, DBP, 6 min walk, RPE</td>
<td>Continuous (ratio, ordinal) physical measurement</td>
</tr>
</tbody>
</table>

MMAT=Mixed Methods Appraisal Tool (****=100%); I= Intervention/experimental group; C= Control group; RCT=Randomised Controlled Trial; B/A=Before and after; QUAL=Qualitative; T2DM=Type 2 diabetes Mellitus; T2DM*=Only one subject had Type 1 diabetes; HBP= Hypertension (high blood pressure); BMI=Body mass index; SS= Sum of skin fold; RHR= Resting heart rate; HbA1c=Fasting Glycated Haemoglobin; SBP=Systolic Blood Pressure; DBP=Diastolic Blood Pressure; SUA=Serum Uric Acid; TC= Total Cholesterol; RPE=Rating of Perceived Exertion; VO2 max= maximal oxygen uptake/aerobic capacity; FBS=Fasting blood sugar.
### Table 6.2: Intervention components in the experimental/quasi-experimental studies

<table>
<thead>
<tr>
<th>Authors</th>
<th>Intervention components</th>
<th>Format</th>
<th>Provider/Training</th>
<th>Intervention duration</th>
<th>Session duration/Frequency</th>
<th>Context within which intervention was delivered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debussche et al. (746)</td>
<td>Shaping knowledge (information provision), restructuring the physical and social environment, Behavioural rehearsal/practice, habit formation, self-monitoring of behaviour, goal setting (behaviour), feedback on behaviour, problem solving, action planning, health consequences, regulate negative emotions, prompts/cues and action planning (including implementation intentions)</td>
<td>Face-to-face, Group-based</td>
<td>Nurse, Dietician, Creole speaking educators, exercise physiologist/Not stated</td>
<td>9 months</td>
<td>Not stated/Once every 3 months</td>
<td>Hospital</td>
</tr>
<tr>
<td>van der Does and Mash (750)</td>
<td>Shaping knowledge (information provision), health consequences, Self-monitoring of behaviour and outcome of behaviour, action planning, problem solving, goal setting (behaviour), identification of self as role model, pharmacological support and action planning (including implementation intentions).</td>
<td>Face-to-face, Group-based</td>
<td>Dietician, Health promoter, a Doctor/Not stated</td>
<td>4 weeks</td>
<td>One hour/Once a week</td>
<td>Primary health care clinic</td>
</tr>
<tr>
<td>Rotheram-Borus et al. (752)</td>
<td>Shaping knowledge (information provision), Social support (practical), social support (general), social support (emotional), problem solving, regulating negative emotions, health consequences, feedback on behaviour, goal setting (behaviour), action planning, Instruction on how to perform a behaviour, self-monitoring of outcome of behaviour, prompts/cues</td>
<td>Face-to-face, Group-based, Telephone-based</td>
<td>Peers/role models (with diabetes)/Training provided</td>
<td>12 weeks</td>
<td>Not stated/Once a week</td>
<td>Local health clinic</td>
</tr>
<tr>
<td>Mathunjwa et al. (749)</td>
<td>None</td>
<td>Face-to-face</td>
<td>Experienced instructors/Not stated</td>
<td>10 weeks</td>
<td>One hour/Three times a week</td>
<td>Laboratory</td>
</tr>
<tr>
<td>Authors</td>
<td>Intervention components</td>
<td>Face-to-face, Individual</td>
<td>Physiotherapist/Not stated</td>
<td>8 weeks</td>
<td>One hour/Three times a week</td>
<td>Tertiary hospital</td>
</tr>
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<tr>
<td>Ezema et al. (745)</td>
<td>None</td>
<td>Face-to-face, Individual</td>
<td>Physiotherapist/Not stated</td>
<td>8 weeks</td>
<td>One hour/Three times a week</td>
<td>Tertiary hospital</td>
</tr>
<tr>
<td>Bello et al. (751)</td>
<td>Shaping knowledge (information provision), Health consequences, Pharmacological support information</td>
<td>Face-to-face, Individual</td>
<td>Pharmacists/Not stated</td>
<td>12 weeks</td>
<td>Not stated/Once in every month</td>
<td>Primary health care clinic</td>
</tr>
<tr>
<td>Lamina and Okoye (743)</td>
<td>None</td>
<td>Face-to-face, Individual</td>
<td>Physiotherapist/Not stated</td>
<td>8 weeks</td>
<td>One hour/Three times a week</td>
<td>Tertiary hospital</td>
</tr>
<tr>
<td>Van Rooijen et al. (747)</td>
<td>Shaping knowledge (information provision), habit formation, behavioural rehearsal/practice, goal setting (behaviour), action planning, problem solving, social support (practical), prompts/cues</td>
<td>Face-to-face, Group-based</td>
<td>Physiotherapists (assisted by Podiatrist)/Not stated</td>
<td>4 weeks</td>
<td>Not stated/Once a week</td>
<td>Tertiary hospital</td>
</tr>
<tr>
<td>van Rooijen et al. (748)</td>
<td>Shaping knowledge (information provision), behavioural rehearsal/practice, problem solving, action planning, social support (practical), graded tasks, self-monitoring of behaviour</td>
<td>Face-to-face, Group-based</td>
<td>Physiotherapists/Not stated</td>
<td>12 weeks</td>
<td>45 minutes/Once every 2 weeks</td>
<td>Home Tertiary hospital</td>
</tr>
</tbody>
</table>

∞ = Labelling was done by the reviewers; BCT = Behaviour Change Technique Taxonomy
### Table 6.3: Characteristics and results of qualitative and mixed-methods studies

<table>
<thead>
<tr>
<th>Authors</th>
<th>Country</th>
<th>Study designs</th>
<th>Study quality</th>
<th>Objectives</th>
<th>Chronic condition</th>
<th>Sample size</th>
<th>Gender</th>
<th>Age (years)</th>
<th>Socio-economic status</th>
<th>Setting</th>
<th>Data collection format/analyses</th>
<th>Themes</th>
<th>Authors’ conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serfontein and Mash (753)</td>
<td>South Africa</td>
<td>Qualitative description</td>
<td>****</td>
<td>To explore patients’ experience of an educational programme (MI) To explore change in self-care activities, including diet, medication, physical activity, and foot care.</td>
<td>Diabetes</td>
<td>13</td>
<td>Female=92.3%</td>
<td>Range: 41-68</td>
<td>Low</td>
<td>Urban</td>
<td>Indepth interviews / Framework method</td>
<td><strong>Experiences of the educational programme</strong> 1. Information on diabetes 2. Organisation of the educational sessions 3. Educational material 4. Communication style 5. Session structure 6. Competency of health promoters <strong>Changes in self-care activities</strong> Diet, Physical activity, Medication, Foot care, Other self-activities</td>
<td>Study supports wider implementation of this programme, following considerations of patient recommendations</td>
</tr>
<tr>
<td>Authors</td>
<td>Country</td>
<td>Study designs</td>
<td>Study quality</td>
<td>Objectives</td>
<td>Chronic condition</td>
<td>Sample size</td>
<td>Gender</td>
<td>Age (years)</td>
<td>Socio-economic status</td>
<td>Setting</td>
<td>Data collection format/analyses</td>
<td>Themes</td>
<td>Authors’ conclusions</td>
</tr>
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</tr>
<tr>
<td>van der Does and</td>
<td>South</td>
<td>Mixed methods (Non-controlled B/A with Qualitative description)</td>
<td>***</td>
<td>To evaluate the Take Five School (TFS) group education programme</td>
<td>T2DM</td>
<td>95</td>
<td>Female=81.0%</td>
<td>Mean: 51.6</td>
<td>Low</td>
<td>Rural</td>
<td>Focus group interviews, Individual interviews / Framework method</td>
<td>1. Strengths of the programme 2. Weaknesses of the programme 3. Opportunities 4. Threats</td>
<td>Study supports the effectiveness of group diabetes education in primary care context</td>
</tr>
</tbody>
</table>

B/A=Before and after clinical trial; MMAT=Mixed Methods Appraisal Tool (****=100%); HBP= High blood pressure/hypertension; DM=Diabetes Mellitus; T2DM=Type 2 Diabetes Mellitus; MI=Motivational interviewing
6.4.4 Effectiveness of physical activity-related interventions for improving biomedical and psychosocial outcomes in adult African patients with common NCDs in Africa

Short term improvements found in biomedical outcomes were often not sustained, while other research reported conflicting findings.

Statistically significant improvements in the short term (<1 year) were observed for systolic/diastolic blood pressure (2 RCTs (743, 745) and 1 B/A study (749); glycated haemoglobin (1 RCT and 1 B/A study (747, 751); fasting blood glucose (1 RCT (745) and 2 B/A studies (749, 751); cholesterol (1 RCT (743) and 1 B/A study (749); triglycerides (1 B/A study (749); BMI (2 B/A studies (749, 751); weight, waist and hip circumference (1 B/A study (749); aerobic capacity and serum uric acid (1 RCT (743); and walking distance (1 RCT study (748).

Statistically significant long term improvements (≥1 year) were reported for systolic/diastolic blood pressure (1 RCT (746); glycated haemoglobin (1 RCT (746); triglycerides (1 RCT (746); and cholesterol (1 RCT (747).

There were no improvements in the short term for systolic/diastolic blood pressure (1 B/A study (752) and fasting blood glucose (2 B/A studies (749, 751). No changes were seen in the long term for glycated haemoglobin (1 RCT (747); cholesterol (1 RCT (746) and waist circumference/fat mass (1 RCT (746). Lack of improvements in the short and long term were observed for fasting blood glucose (1 B/A study (752) and 1 RCT (746), and BMI (3 RCTs (746-748) and 1 B/A study (752) (Appendix 29).

Although blood pressure was improved in the long term in one RCT (746), there was no significant differences between intervention and control groups that both received an initial intervention of combined interactive educational sessions and physical activity performance. Glycated haemoglobin was more improved in the short term by relaxation than by aerobic exercise, which also had an impact (748). No significant difference in glycated haemoglobin was seen between intervention and control groups that received an initial intervention of combined interactive educational sessions and physical activity performance in one RCT (746). Although walking distance (6m) was better improved by aerobic exercise, it was also improved by relaxation in the short term in one RCT (748).
Psychosocial factors were investigated in only three studies (2 RCTs (743, 747), and 1 B/A study (752), and mostly improved in the short term but not in the long term. Only biomedical knowledge of chronic conditions was sustained in the long term (747). Outcomes that improved in the short term were psychosocial status (743); hours slept at night (752); social support and positive coping style (752); and spiritual hope (752). However, emotional distress and negative coping styles did not change significantly over time (752). Attendance rate for interventions was good (71.2%) (746), to excellent (100%) (752), in the two studies that assessed this.

6.4.5 Effectiveness of physical activity-related interventions for improving physical activity in adult African patients with common NCDs in Africa

There were mixed results for the effectiveness of interventions on physical activity behaviour. Sports activity increased significantly in the long term, but general physical activity did not differ from baseline at one-year follow-up in one RCT (746). In this trial, the difference between intervention and control patients who both received an initial intervention involving combined interactive educational sessions about the chronic condition and actual performance of physical activity was not significantly different. Physical activity levels were significantly improved immediately after a four-week intervention in one B/A study (750). However, weekly exercise and the number of steps taken daily did not change significantly over time in another B/A study (752) (Appendix 29).
6.4.6 Experiences and perspectives of adult African patients with common NCDs to physical activity related interventions in Africa

Three themes which highlighted intervention components that may be important to African patients emerged from the qualitative studies.

**Increasing biomedical understanding of chronic condition**

Structured educational programmes that provided biomedical information about a chronic condition were important to patients, although this was often not available through traditional health care (753). Patients wanted educational sessions that were organised, simple and ensured comprehensive information covering all aspects of the chronic condition (750), including management strategies (753). Recapping previous educational sessions enabled patients to remember what was taught and enhanced understanding (753). Communication styles incorporating motivational interviewing principles such as empathy, liveliness and inclusiveness (753), and collaborative learning via group sessions (753) enhanced understanding (“...it becomes a two-way conversation and they often taught me stuff and they taught the group stuff” (750). Self-help educational materials such as handouts, flip charts, booklets and posters also enhanced understanding and recall of educational sessions, and made the sessions more interesting (750, 753).

**Addressing environmental and social barriers**

Adverse environmental conditions and social stressors appeared to limit physical activity despite sufficient biomedical knowledge of a chronic condition. Examples included unsafe environments and poor timing of physical activity (“...so dangerous, I cannot walk in the evenings anymore” (753); family problems, work and patients’ chronic condition (750, 753). However, social support facilitated through both the health professional and other patients in the group sessions may mitigate such stressors (“...when I sit with other people, I feel better” (750, 753). Combined group and individual sessions may be
superior to group sessions alone, due to concerns about privacy which may potentially limit the social support sought and received (750).

**Stimulating/supporting physical activity behaviour change**

Physical activity behaviour may be influenced by motivational interviewing techniques. These included eliciting talk about change, using an enthusiastic communication style and encouraging solutions from a group, which has increased motivation and confidence to improve physical activity (750, 753). However, some research found increasing the focus on chronic disease complications may further increase the motivation to improve physical activity (“More about the complication...it will teach us more to look after yourself...” (750).

Actual performance of the prescribed physical activity, health professionals trained in behaviour change techniques and health facilities adapted for chronic disease management are other factors that may influence physical activity behaviour. Actual practice of physical activity may increase awareness, skills and self-efficacy, potentially facilitating long term physical activity behaviour change (750). Some patients reported that health professionals operating within a biomedical model, without additional training in behaviour change techniques, were more likely to be impatient and angry with patients. This worsens the patient-health professional relationship, and makes it unlikely that long term physical activity would be facilitated (“Sometimes the doctor is angry or impatient then you don’t feel free to ask questions” (750). Health professionals may not buy into behaviour change interventions due to undervaluing the skills needed for administering such interventions, lack of ownership, doubts about the effectiveness of such programmes and poor motivation, which might be alleviated by providing ongoing training and support (750).

Other factors potentially limiting behaviour change were inadequate venues or programmes that were not integrated into routine care, which made patients feel unwanted (“...the health worker was scrambling around to get a room for her own use...I think the head of the clinics, often saw it more as a liability” (753). Programmes that were not incorporated into routine care meant there were often conflicting opinions about who should lead interventions (750) and timing problems (“...communication
system was clearly not of the best, information didn’t always get to me…then the whole thing already happened…” (753).

Potentially helpful factors included: programmes that were integrated into routine care; ongoing programmes with the possibility of repeat sessions for patients; structured sessions with specific dates and times that aligned with patients’ other hospital appointments and daily activities; and interventions delivered by specifically trained health professionals (750). Linking such programmes to patient support groups may further contribute to maintaining long term physical activity behaviour (750).

6.4.7 Behaviour change intervention components for improving physical activity in Africa

Table 6.4 shows that five BCTs: shaping knowledge, behavioural rehearsal/practice, habit formation, and restructuring the physical and social environment identified in the qualitative findings were found in one good quality RCT (746) that improved sports activity in the long term. Two BCTs: shaping knowledge and health consequences, identified in the qualitative studies, were found in one B/A study (750) that improved physical activity in the short term (4 weeks). Five BCTs: shaping knowledge, regulating negative emotions, social support (practical), social support (general) and social support (emotional); obtained from the qualitative findings, were recorded in one B/A study (752). However, this study found no short term (3 and 6 months) improvements in weekly exercises or number of steps taken daily. Many studies did not assess physical activity at all. Four BCTs- shaping knowledge, instruction on how to perform a behaviour, behavioural rehearsal/practice and habit formation were found in one RCT (748). One BCT: shaping knowledge, identified in the qualitative studies, was found in six experimental/quasi-experimental studies (746-748, 750-752).
**Table 6.4: Comparative analysis of quantitative and qualitative results**

<table>
<thead>
<tr>
<th>BCTs: Corresponding themes</th>
<th>Format</th>
<th>Provider</th>
<th>Intervention duration</th>
<th>Session duration/Frequency</th>
<th>Context within which intervention was delivered</th>
<th>Clinical trials where found</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health professionals trained in behaviour change techniques</td>
<td>Health facility adapted for chronic disease management</td>
<td>None identified</td>
<td>Ongoing with possibility of repeat sessions</td>
<td>None identified</td>
<td>None identified</td>
<td></td>
</tr>
<tr>
<td>Combined group and individual face to face sessions</td>
<td>None identified</td>
<td>None identified</td>
<td>None identified</td>
<td>None identified</td>
<td>None identified</td>
<td></td>
</tr>
</tbody>
</table>

**Shaping knowledge: Increased biomedical knowledge of chronic condition**

- Debussche et al (746)
- van der Does and Mash (750)
- Rotheram-Borus et al (752)
- Bello et al (751)
- Van Rooijen et al (747)
- van Rooijen et al (748)

**Instruction on how to perform a behaviour: Used self-help materials**

- van Rooijen et al (748)
<table>
<thead>
<tr>
<th>Regulate negative emotions, Social support (practical), Social support (general) and Social support (emotional): Social support, coping and stress management</th>
<th>Rotheram-Borus et al (752)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health consequences: Emphasized complications of chronic condition to increase motivation to improve physical activity</td>
<td>van der Does and Mash (750)</td>
</tr>
<tr>
<td>Behavioural rehearsal/practice and habit formation: Actual performance of physical activity within sessions</td>
<td>van Rooijen et al. (748) Debussche et al (746)</td>
</tr>
<tr>
<td>Restructuring the physical environment and restructuring the social environment: addressed environmental factors that may pose as barriers</td>
<td>Debussche et al (746)</td>
</tr>
</tbody>
</table>

BCT = Behaviour change technique taxonomy
Three interventions (743, 745, 749) did not contain any behaviour change components at all. Four intervention components identified as important in the qualitative studies: training health professionals in behaviour change techniques, health facility adapted for chronic disease management, ongoing interventions with the possibility of repeat sessions for patients, and combined group and individual face to face sessions were not found in any of the studies (Table 6.4).

6.5 Discussion

This review sought to develop an understanding of the intervention components employed to improve physical activity behaviour in adult patients with common NCDs in Africa. Conclusions can only be very tentative based on the limited evidence available to this review. Low quality evidence suggests that sports activity was improved in the long term but general physical activity was only enhanced in the short term. There was inconclusive evidence about the effects of physical activity related interventions on biomedical and psychosocial outcomes in Africa. There was no available evidence on the effectiveness of physical activity related interventions for any type of chronic pain in Africa.

Increasing African patients’ biomedical knowledge of their chronic condition (BCT-shaping knowledge) may be insufficient to promote physical activity behaviour change, as was evident both in experimental/quasi-experimental studies that demonstrated improvements in physical activity and those that did not. Unfortunately, this BCT was the primary focus of many studies in Africa, even though it has proved to be an inadequate intervention in many western developed countries (721).

Some moderate quality evidence suggests that BCTs such as behavioural rehearsal/practice, habit formation, and restructuring the physical and social environment may contribute to long term maintenance of physical activity in Africa (746). Low quality evidence suggests that explaining health consequences may support short-term improvements in physical activity in Africa (750). The evidence supporting this assumption is severely limited since only three of the nine experimental/quasi-experimental studies assessed physical activity behavioural outcomes at all (746, 750,
Only one RCT (747) and one B/A study (752) were theoretically informed, one of which assessed behavioural outcomes including physical activity (752). Notably, three studies (743, 745, 749) did not target behaviour, and had none of the intervention components identified as potentially promising from the qualitative studies.

These results highlight the key emphasis on biomedical rather than behavioural outcomes in Africa which may prevent successful behaviour change. Furthermore, the four possible intervention components identified in the qualitative studies: training health professionals in behaviour change techniques, health facility adapted for chronic disease management, ongoing interventions with the possibility of repeat sessions for patients, and combined group and individual face to face sessions which might improve outcomes, were not found in all studies. Moreover, fidelity was not assessed in any of the studies, and lack of appropriate training may well have further limited the extent to which any identified BCTs were delivered with fidelity. The only trial that mentioned training health professionals in counselling skills maintained sports activity in the long term. However, there were no details recorded about this training and there was no assessment of intervention fidelity (746).

This systematic review has demonstrated the applicability of the BCT taxonomy (356) to Africa which may contribute to the development of better interventions in Africa in the future. Twenty one BCTs were identified from the experimental/quasi-experimental studies, despite evidence suggesting that increasing the number of BCTs within an intervention does not improve physical activity behaviour (721). Fifteen intervention components comprising eleven BCTs and four procedure-related components that may improve acceptability, were identified from the qualitative studies. Most identified BCTs are represented in the exercise related techniques of behaviour change (716), and the refined taxonomy of behaviour change techniques for improving physical activity and healthy eating behaviours (720). However, many relevant intervention components for improving physical activity may not have been identified because of the small number of clinical and qualitative studies retrieved, and because this field of research is novel in Africa.

In contrast, in western developed countries, interventions that combined self-monitoring with at least one other self-regulatory technique derived from control theory were significantly more effective than other interventions in improving physical activity.
and healthy eating (721). However, that meta-regression (721) concentrated only on self-regulation techniques derived from control theory, used a taxonomy of 26 BCTs which lacked many techniques found in the expanded taxonomy of 93 BCTs (356), and did not thoroughly investigate the impact of procedure-related intervention components (721).

Control theory deals with peoples’ behaviour with input and how behaviours are modified by feedback. It provides a way of construing existing biological systems and provides a theoretical approach to self-regulation (754). Self-regulation involves stopping harmful/maladaptive behaviour and creating positive behaviour, and is typically needed when there is conflicting motivation. It comprises four components: standards of desirable behaviour, motivation to meet standards, monitoring of situations and thoughts that precede breaking standards, and willpower/internal strength to control urges (755, 756).

Of the BCTs identified as being associated with physical activity behaviour changes in the present review, only health consequences were represented in the previous review (721). However, restructuring the physical and social environment, and behavioural rehearsal/practice in the 93 BCTs, used in this review, may have been described as barrier identification and model/demonstrate behaviour respectively, in the 26 BCTs, used in the other review (721). As suggested by observational studies in Africa, contextual factors such as culture and family dynamics (757), unrealistic expectations of cure (758, 759), alternative health care utilisation (760, 761), and gender differences in physical activity and health care utilisation (762) may influence physical activity behaviour. These need investigating in future trials in Africa.

The generalisability of the findings in this review is limited by both the quality of evidence and paucity of studies conducted in just a few countries. A few interventions were very complex, containing dietary and pharmacological elements, which may have influenced outcomes. The intervention components identified in the qualitative studies that may increase the acceptability of physical activity behaviour change interventions, may not be comprehensive as they were derived from a few qualitative studies, all of which were conducted with people with diabetes. This limits generalisability to other chronic conditions. In addition, identification of intervention components could have been affected by inaccurate intervention description by the primary authors.
6.6 Conclusions

Some potentially promising behaviour change intervention components for improving physical activity behaviour in Africa have been identified. However, results must be treated with caution as high quality evidence is lacking and much more work in this area is required. Future interventions in Africa need to focus on targeting behaviours that are amenable to change, such as physical activity, and linking this to biomedical and psychosocial outcomes in Africa. Hence, short and long term behavioural, biomedical and psychosocial outcomes will need to be assessed to improve the evidence-base for such interventions in Africa. High quality trials are required to test the utility of the identified promising behaviour change intervention components in improving physical activity in Africa.

The development of an exercise-related behaviour change intervention for people with CLBP in rural Nigeria is the focus of the next chapter.
Development of ‘Ukwu Oma’ (Good Back) Programme: an intervention mapping approach

7.1 Chapter summary

This chapter presents the application of the intervention mapping (IM) approach in the development of a complex behaviour change intervention aimed at reducing non-specific chronic low back pain (CLBP) disability in rural Nigeria. The chapter begins with the rationale for using the IM approach (section 7.2), followed by the methods (section 7.3) which shows the application of the first four steps of the approach. The developed intervention is described subsequently (section 7.4). The practicalities of applying the approach is explored in the discussion (section 7.5).

IM appears to be a suitable framework for designing behaviour change interventions in rural Nigeria.

7.2 Introduction

7.2.1 Rationale for using intervention mapping

Frameworks for developing complex interventions often have limitations in terms of their applicability to any model or theory of behaviour, acknowledgement of contextual factors, and translation of these into actual programme materials and activities. Although, the behaviour change wheel acknowledges contextual factors (environmental restructuring), it is specifically linked to theories of motivation (715). The MINDSPACE (Messenger, Incentives, Norms, Defaults, Salience, Priming, Affect, Commitment and...
Ego) framework focuses on providing a ‘toolkit’ for policy-makers designing policies for behaviour change, and emphasizes the influence of contextual factors on behaviour (763). However, the framework does not specify the need for theory in intervention development (763). None of these frameworks provided concrete steps to follow in the translation of theory and environmental factors into programme content. The Intervention Mapping (IM) approach (764-767) does not appear to have these limitations.

IM is compatible with any theory, and provides strategies for identifying the determinants of the desired behaviour, and matching them with appropriate theory-based methods for change (249, 766). Furthermore, the IM approach was selected to develop the self-management programme because it is also consistent with the Medical Research Council (MRC) guidance (377), by acknowledging the importance of evidence, theory, process and outcomes in developing and evaluating complex interventions. Although both the MRC guidance and IM emphasize evidence and theory in developing behaviour change interventions, IM also focuses on contextual factors such as personal and environmental determinants of the desired behaviour change (768, 769). Moreover, the MRC guidance does not specify how to select and apply theory (715), which is provided by the IM approach (249).

As suggested in the systematic review in Chapter six (Study 5), contextual factors (restructuring the physical and social environment) may be important in influencing exercise-related behaviour in Africa. IM may be useful in developing complex behaviour change interventions in Africa since its social ecological paradigm acknowledges both personal and environmental factors as determinants of health (770, 771).

The IM approach was useful in developing a community-based intervention that aimed to increase consumption of a healthy balanced diet, increase physical activity, reduce sedentary behaviour and promote reproductive health in adolescents in a rural South African community, while acknowledging multiple domains of influence: community, family and individual (770). Although the effectiveness of this intervention has not been evaluated, IM enabled the tailoring of a western intervention to suit a rural African context (770). The evaluation of an intervention developed using IM to target sexual and reproductive health in early adolescents in Tanzania and South Africa, enabled the
modification of social cognitive models to fit an African context (771). For instance, the intervention acknowledged that the influence of cognitions on behaviour may be limited by contextual and social barriers to the desired behaviour in Africa, e.g. availability of condoms for safe sexual practices (771). Furthermore, the IM approach facilitated collaboration between European and African researchers, health promoters, and communities in this study (771).

The IM approach iteratively moves from problem identification to problem solving. It has 6 steps:

i. Needs assessment
ii. Detailed mapping of programme objectives and their behavioural and environmental determinants
iii. Selecting theory and techniques/strategies to modify the determinants of behaviour and the environment
iv. Producing intervention components and materials
v. Implementation
vi. Evaluation (766).

The completion of each step serves as a guide for the subsequent step. The first step is used to identify what needs to be changed and for whom. The second step involves the development of matrices of change objectives. The third step contains theory-based intervention methods for targeting the performance objectives and their determinants. Methods, materials and practical applications are integrated into an organised programme in step four. Step five includes planning for intervention adoption, implementation and sustainability in real-life contexts. In the final step, plans for conducting efficacy and process evaluations are drawn up (766).

This chapter will focus on the first four steps of the IM approach, as was done in a similar study in rural South Africa (770), while acknowledging the MRC guidance on developing and evaluating complex interventions (377). Steps five and six of the IM approach will be addressed in the next chapter. This chapter acknowledges the items in the template for intervention description and replication (TIDieR) checklist and guide (772).
7.2.2 Aims of the chapter

1. Develop a self-management (‘ukwu oma’: good back) programme aiming to reduce CLBP disability in rural Nigeria, using the IM approach.
2. Describe the self-management programme.

7.3 Methods

7.3.1 Step one: Needs Assessment

This involved analysing the problem of CLBP in rural Nigeria, its associated behavioural and environmental conditions, and the determinants of these conditions. This was done through a thorough literature review (Chapter 1), two qualitative studies in Chapters two and three (Studies 1 and 2), and two quantitative studies in Chapters four and five (Studies 3 and 4). The literature review showed that a combination of physical, psychological and social factors may be implicated in CLBP disability. However, most of the evidence cited was from western developed countries and none was available from rural Nigeria or any other rural African context.

As qualitative research is the best way to begin to study an area with little previous research, two qualitative studies, of people living with CLBP in a rural Nigerian community (Study 1), and the practitioners they consulted (Study 2), were conducted. The findings highlighted maladaptive beliefs and coping strategies such as drug dependence and cure seeking resulting in high levels of emotional distress and disability. The consulted practitioners’ beliefs and practices appeared to reinforce maladaptive beliefs and coping strategies. The perceived biopsychosocial factors associated with the experience of CLBP from the qualitative findings were work-related biomechanical factors, illness perceptions, fear avoidance beliefs, pain intensity, anxiety, depression, catastrophising, coping and social support (376, 708).

The generalisability of these findings and the individual contribution of the perceived biopsychosocial factors to CLBP disability remained unknown. Consequently, a population-based exploratory cross-sectional survey of a representative sample of
people living with CLBP was conducted (Study 4). The survey showed that illness perceptions, fear avoidance beliefs, female gender, pain intensity, catastrophising, anxiety and depression were associated with CLBP disability in rural Nigeria (773). Notably, illness perceptions had the strongest associations with both self-reported and performance based disability. Fear avoidance beliefs were also associated with both self-reported and performance-based disability (Study 4). The comparatively weaker association of anxiety and depression with CLBP disability may be due to unclear understanding of emotional concepts in rural Nigeria, as suggested in the cross-cultural adaptation of the outcome measures (Study 3).

The literature review in Chapter one (section 1.6) suggested that comprehensive programmes that combined psychological strategies with exercises and postural training may be relevant for reducing CLBP disability in rural Nigeria. Therefore, the overall aim of the ‘ukwu oma’ programme is to reduce CLBP disability by achieving two key programme objectives:

1. Reduce the impact of illness perceptions, fear avoidance beliefs, catastrophising, anxiety and depression by targeting maladaptive illness perceptions about CLBP.
2. Facilitate the adoption of specific exercises and correct posture to limit disability.

7.3.2 Step two: Detailed mapping of performance objectives with their personal and environmental determinants to form a matrix for each programme objective

Tables 7.1 and 7.2 below illustrate the two matrices developed for the two programme objectives identified in step one.

In this step, each key programme objective identified in the needs assessment is broken down into performance objectives. Behavioural determinants are generic aggregates of beliefs, that are specific to a behaviour, population, and context (249). Personal determinants were as defined by Kok et al. (249), as the generic modifiable psychological variables that are assumed to be causal antecedents of behaviour. External determinants are factors external to the individual that may influence behaviour. Personal and external determinants of behaviour were identified from the results of the
needs assessment studies, and a systematic review in Chapter six (Study 5). The determinants were specified for each of the performance objectives to form a matrix for each programme objective.

The results of the qualitative studies (Studies 1 and 2) showed that people in rural Nigeria did not have appropriate information about CLBP. This appeared to foster various maladaptive beliefs such as unhelpful CLBP beliefs, fear avoidance beliefs, catastrophising about CLBP, anxiety and depression, and coping strategies such as cure seeking and drug dependence. It was therefore necessary that health literacy should be targeted as a personal determinant of maladaptive beliefs and coping strategies. Self-awareness, self-efficacy and personal preference were included as personal determinants as they are self-regulation constructs, which may bridge the intention-behaviour gap (313). These self-regulation constructs have been found to be useful as part of behaviour change interventions in rural Africa (770). Health professional’s skills, and accessible and adequate health facilities were identified as relevant environmental determinants of behaviour based on the findings of the systematic review (Study 5), and the qualitative study (Study 1). These studies suggested that these factors may be important for physical activity related behaviour.
Table 7.1: Matrix of change for programme objective 1 - Reduce the impact of illness perceptions, fear avoidance beliefs, catastrophising, anxiety and depression by targeting maladaptive illness perceptions about CLBP

<table>
<thead>
<tr>
<th>Personal determinants</th>
<th>Performance objective</th>
<th>Health literacy</th>
<th>Self-awareness</th>
<th>Self-efficacy</th>
<th>Personal preference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formulate alternative adaptive illness perceptions about CLBP</td>
<td>Increase knowledge about CLBP and its causes</td>
<td>Awareness of existing maladaptive illness perceptions that result in maladaptive coping strategies (drug dependence and cure seeking)</td>
<td>Ability to challenge maladaptive illness perceptions and adopt adaptive ones</td>
<td>Ability to choose adaptive illness perceptions that will reduce maladaptive coping strategies (drug dependence and cure seeking)</td>
<td></td>
</tr>
</tbody>
</table>

**External/environmental determinants**
- Health professional skills
- Health facility structure

| Health professional has the skills to facilitate participants’ formulation of alternative adaptive illness perceptions about CLBP by taking them through the required steps: provide information, create awareness of maladaptive illness perceptions and support the challenge of these perceptions. This means providing alternative explanations where appropriate which may include challenging pessimistic illness cognitions, and using problem-focussed coping behaviours to manage stressors and improve any distress. |
| Health facility is accessible and adequate to support free discussion by participants and health professional |

Table 7.2: Matrix of change for programme objective 2 - Facilitate adoption of specific exercises and correct posture

<table>
<thead>
<tr>
<th>Personal determinants</th>
<th>Performance objective</th>
<th>Health literacy</th>
<th>Self-awareness</th>
<th>Self-efficacy</th>
<th>Personal preference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Take up exercises and correct posture as self-management strategies for CLBP</td>
<td>Increase knowledge of exercises and correct posture as effective long term management options for CLBP</td>
<td>Awareness of current negative beliefs about exercises and correct posture</td>
<td>Learn specific exercises and correct posture, and have the ability to incorporate them into daily life</td>
<td>Ability to decide which exercises to perform at different times in daily life</td>
<td></td>
</tr>
</tbody>
</table>

**External/environmental determinants**
- Health professional skills
- Health facility structure
- Family support

| Health professional has the skills to teach participants specific exercises and correct posture, and support their adoption in daily life |
| Health facility structure is accessible and supports performance of group exercise and postural training sessions |
| Family members support adoption of exercises and correct posture in daily life |
Based on this evidence, the personal determinants for the performance objective - formulating adaptive alternative illness perceptions about CLBP were: increasing knowledge about CLBP, self-awareness about existing maladaptive illness perceptions about CLBP, self-efficacy to challenge maladaptive illness perceptions about CLBP and personal preference to choose more adaptive illness perceptions about CLBP. External determinants for formulating adaptive alternative illness perceptions about CLBP were: health professionals’ skills in facilitating participants’ formulation of adaptive illness perceptions about CLBP, and a health facility structure that is accessible and supports adequate delivery (Table 7.1).

The determinants for exercise and correct posture are based on the findings in Chapter two (Study 1) which suggested that exercise was not viewed as a legitimate treatment in rural Nigeria. The personal determinants for exercising and correct posture for self-managing CLBP were: increasing knowledge about exercises and correct posture as effective management strategies for CLBP, self-awareness of current negative beliefs about exercises and correct posture, self-efficacy to learn specific exercises and correct posture, and personal preference to choose specific exercises to perform at different times. The external determinants for exercising and adopting better posture for self-managing CLBP were health professional’s skills in teaching specific exercises and correct posture, health facility structure that is accessible and supports group exercise and postural training sessions. Family support was added as an external determinant of exercises and correct posture. This was because the systematic review in Chapter six (Study 5) suggested that restructuring the social environment may be important for physical activity related behaviour change in Africa (Table 7.2).

These matrices of change provide a map that facilitated the identification of specific intervention components, methods, strategies and materials.

7.3.3 Step three: Selecting theory, techniques and strategies to modify the determinants of behaviour and the environment

The literature review in Chapter one suggested that the Leventhal’s SRM of illness cognitions (179, 181) may be relevant in understanding health behaviour in Nigeria, and
have also explained CLBP outcomes in western developed countries (164, 173, 176). Furthermore, the results of the qualitative and quantitative studies (Chapters 2 to 5) appeared to support the use of this theory. For instance, illness perceptions, were the strongest predictors of self-reported and performance-based CLBP disability in rural Nigeria (Study 4).

Consequently, theory-based methods aligned with the SRM were identified from the taxonomy of behaviour change methods when using the intervention mapping approach (249). The behaviour change techniques used to deliver these methods were labelled according to the behaviour change taxonomy of 93 hierarchically clustered techniques (356).

As suggested in Chapter one, CBT may be an appropriate theory-based method for challenging illness perceptions, consistent with the SRM (205, 207, 774). CBT explains that the way in which a person thinks about their problem will produce emotions, including associated physical sensations, which then drive behaviour. The behaviour can subsequently maintain the thoughts/beliefs, thus retaining the impact of the health condition in a vicious cycle (775). CBT provides a toolkit of interventions to target cognitions/beliefs, emotions and behaviours interactively, and embodies a range of interventions that aim to change behaviour directly using models of learning, and indirectly by changing beliefs (775). CBT has been useful in group-based (774, 776-778) and individual-based (779, 780) interventions. However, CBT alone has been reported to be ill equipped for managing individuals with compromised cognitive function, or low motivation for behaviour change in western settings (781, 782). In rural Nigeria, high illiteracy rates and a biomedical model of CLBP may create ambivalence to behaviour change.

Exercise and correct posture adoption are behavioural targets of the self-management programme. However, the results of the qualitative study in Chapter two (Study 1) suggested that exercises and correct posture would not align with the community dwellers’ beliefs about CLBP (708). It was therefore necessary to explore the factors that might improve the acceptability of exercises for managing CLBP. A systematic review as part of this PhD (Study 5), was used to identify relevant intervention components that may increase acceptability and facilitate physical activity behaviour change in Africa. Techniques from motivational interviewing were found useful for communicating health
information and facilitating physical activity related behaviour change in people with chronic non-communicable conditions in Africa. However, no study on chronic pain or CBT was identified.

Motivational interviewing is defined as a collaborative, goal-oriented style of communication that pays particular attention to the language of change to strengthen patients’ motivation and commitment to changing a particular behaviour by exploring their reasons for change within an atmosphere of acceptance and compassion (335, 783). Motivational interviewing has four fundamental processes: engaging, guiding, evoking and planning (783). Similar to the CBT, it is a behaviour change method that also aligns with the SRM (249). However, unlike CBT, it may also be useful in individuals with compromised cognitive function or low motivation for behaviour change such as people with bipolar disorder and substance abuse (781, 782).

Therefore, integrating techniques from CBT and motivational interviewing to equip individuals with practical steps to enable behaviour change (781) appears to be a logical approach in rural Nigeria. Separating treatment phases so that the essential principles of each approach are not compromised (781), may be one way of responding to the call for research improving CBT participation and efficacy in individuals with low literacy levels (784).

7.3.4 Step four: producing intervention components and materials for practical application

Detailed programme components and materials are illustrated in Table 7.3 below. Intervention components chosen to achieve programme objectives specified in the matrices (step 2) were informed by the results of previous studies. These studies helped identify the relevant themes to explore in the programme. The programme themes addressed relevant biopsychosocial factors including illness perceptions, fear avoidance beliefs, catastrophising, anxiety, depression, occupational biomechanical factors and coping strategies.

Intervention components are the behaviour change techniques (BCTs) used to facilitate behaviour change, and the procedures for the delivery of those BCTs, as defined by
Michie et al. (357). The adopted techniques were as defined in the taxonomy of 93 BCTs (356). The procedures include intervention format, intervention provider, intervention duration, intervention frequency and the context within which the intervention was delivered. The materials include the physiotherapist and patient booklets (Table 7.3).
### Table 7.3: Intervention components

<table>
<thead>
<tr>
<th>Intervention phases/materials</th>
<th>Theory-based behaviour change methods</th>
<th>Delivery informed by</th>
<th>Behaviour Change Techniques (BCTs)-labelled from the 93 BCT taxonomy (356)</th>
<th>Intervention format</th>
<th>Intervention provider</th>
<th>Duration of intervention</th>
<th>Frequency of intervention</th>
<th>Context within which intervention was delivered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education/ Patient and Physiotherapist booklets</td>
<td>MI</td>
<td>MI</td>
<td>Shape knowledge, Emphasize health consequences, Instruction on how to perform a behaviour</td>
<td>Face to face, group exercise sessions, group + individual discussion sessions</td>
<td>Physiotherapist trained in behaviour change techniques</td>
<td>6 weeks</td>
<td>One per week</td>
<td>Rural primary health care centre</td>
</tr>
<tr>
<td>Mapping of existing illness perceptions/ Physiotherapist booklet</td>
<td>Improving physical and emotional states</td>
<td>CBT</td>
<td>Self-assessment of affective consequences, Self-assessment of functional consequences*</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Challenging maladaptive illness perceptions/ Physiotherapist booklet</td>
<td>Improving physical and emotional states</td>
<td>CBT</td>
<td>Regulate negative emotions</td>
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</table>
### Intervention components: BCTs and procedures

<table>
<thead>
<tr>
<th>Intervention Components</th>
<th>BCTs and Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Regulate negative functional consequences</strong></td>
<td></td>
</tr>
<tr>
<td>Formulation of alternative illness perceptions and associated behaviours/ Patient and Physiotherapist booklets</td>
<td>Improving physical and emotional states</td>
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<tr>
<td>Practising the alternative (desired) behaviour (exercises and correct posture) in a supervised session/ Patient and Physiotherapist booklets</td>
<td>Guided practice, Goal setting</td>
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<tr>
<td>Testing of alternative illness perceptions and associated behaviours/ Patient booklet</td>
<td>Guided practice, Self-monitoring of behaviour,</td>
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</table>

MI = Motivational interviewing; CBT = Cognitive behavioural therapy; * = absent in the 93 BCTs
The intervention format selected was face-to-face based on the socio-cultural and socio-economic context of rural Nigeria. The researcher’s field experience from the completed studies, and previous public health projects in this context, suggests that rural dwellers in Nigeria are unlikely to regard programmes that are not face to face as legitimate. Moreover, some of the rural dwellers especially the elderly, may lack access to internet and telephone. Therefore, internet and phone-based self-management programmes may not be feasible for everyone in rural Nigeria.

It is important that the physiotherapist delivering the intervention is trained in behaviour change methods, as evidenced in the systematic review (Study 5), which suggested that a biomedically oriented health practitioner may damage the patient-health professional relationship, and inhibit behaviour change in Africa.

The programme is designed to align with the Stanford self-management support approach: six weeks’ intervention, use of self-regulatory approaches, group-based (ten to fifteen participants per group), peer influence (Chapter 1, section 1.8.3). Individual discussion sessions and delivering the intervention in primary health care were additional programme procedures aimed at overcoming the problems of confidentiality and accessibility reported with the Stanford model (331). Moreover, the literature review (Chapter 1, section 1.8.4) suggested that a programme duration of six weeks delivered once per week is a consistent self-management programme format (Table 7.3).

7.4 Description of the self-management programme

7.4.1 Brief name

The ‘Ukwu Oma’ programme means ‘Good Back’ programme. The researcher chose this name to emphasize the goal of the intervention, and promote the ownership of the programme by the rural dwellers. The ‘Ukwu Oma’ programme is thus a theory-informed, community-based self-management programme for people with non-specific chronic low back pain (CLBP) in rural Nigeria.
7.4.2 Elements essential to the intervention

The ‘Ukwu Oma’ programme is informed by CBT and motivational interviewing, and designed to challenge maladaptive CLBP cognitions and associated behaviours, and facilitate the adoption of exercises and better posture in daily life.

The exercises adopted in this programme were derived from Guy’s and St Thomas’ Physiotherapy back rehabilitation programme (785) and the Nigerian urban back school model (73). The exercises were adapted to suit the rural Nigerian context by including simple exercises that do not require the use of equipment, and making the picture models look similar to rural Nigerian dwellers of all ages and genders, as illustrated in Figures 7.1 and 7.2 below. Correct posture was demonstrated with some culturally relevant functional activities identified from the Nigeria urban back school (73), as illustrated in Figure 7.3 below.
Figure 7.1: warm-up and cool-down exercises
Half lying on elbows

Modified press-up

Back extension with shoulder lift

Alternate leg and arm stretch

Alternate hip and knee flexion; cycling

Single knee to chest

Double knees to chest

Trunk rotation
Back extension in standing

Back arching on all fours

Back extension with leg lift

Bridging

Balance training on wobble board

**Figure 7.2:** Back exercises
Correct and wrong sitting postures

Correct lifting techniques

Sweeping

Working from a table

Having a bath
Getting water from the well

Mopping the floor

Working on a computer or writing

Brushing the teeth

Farming

**Figure 7.3:** correct posture during functional activities
The programme exercises include aerobic, strengthening, neuromuscular, flexibility, and relaxation exercises (Figures 7.1 and 7.2 above; Appendix 30 for patient booklet; Appendix 31 for physiotherapist booklet). The exercise programme incorporates both the principles of exercise physiology and behaviour change principles (786, 787). Exercise prescription is underpinned by dose, type and progression of exercise, the so-called FITT principle (786, 787). Exercise dose is the amount of exercises performed by a participant which includes three components: frequency (F), intensity (I) and duration (T). Frequency means how often an exercise is performed such as the number of sessions, times or days per week. Intensity is the rate of energy expenditure, effort or load associated with the specific exercise aimed at achieving a particular health-related purpose such as cardiovascular endurance, muscular strength and endurance, or flexibility (786, 787). Duration is the length of time for the exercise, and type (T) is the mode or kind of exercise. Exercise progression may involve the systematic increase in the demand of an exercise in the FITT domains (786, 787). However, no evidence supports any specific exercise progression for the self-management of CLBP. Participants will therefore be encouraged to progressively increase their daily exercises based on their tolerance levels.

Each programme session includes warm up exercises, back specific exercises, and cool down exercises (Figures 7.1 and 7.2 above). Warm up exercises are a group of exercises performed immediately before an activity that enables the body to adjust from rest to activity. It allows more delivery of oxygen to the exercising muscles; improves mechanical efficiency and power; increases speed of nerve impulses; increases blood flow to the muscles; prevents injuries to the soft tissues; improves cardiovascular response; and reduces the risk of high body temperature during exercising due to earlier sweating (786, 787). Conversely, cool down aims to slowly decrease the heart rate and lower body temperature which were elevated by exercise. It promotes faster recovery from fatigue by rapidly decreasing blood and muscle lactic acid levels; reduces muscle soreness by preventing the pooling of blood in the legs; and reduces catecholamine levels in the blood which prevents cardiac events (786, 787). People participating in the ‘ukwu oma’ programme will be educated about pain secondary to delayed muscle soreness during the educational sessions to avoid fears about reinjury which undermines exercise programmes (265).
7.4.3 Procedures, activities, and processes used in the intervention

The ‘Ukwu Oma’ programme is a six-week group self-management programme that incorporates individual discussion sessions. The programme is administered once per week.

The intervention is not designed to be read out to participants, rather the delivering Physiotherapist or health professional is expected to read and prepare for each session before delivering the session. The programme is designed to be adapted to suit people within their socio-cultural contexts, as participants are encouraged to discuss their life’s goals, and the barriers and facilitators to achieving them.

The six sessions of the programme are based on six different themes as illustrated in Table 7.4 below.
**Table 7.4: The six themes of the six programme sessions**

<table>
<thead>
<tr>
<th>Theme</th>
<th>(Session)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(Session 1)</td>
<td>Challenging the biomechanical understanding of non-specific chronic low back pain (CLBP). Exercises and postural training are noted as important tools in managing CLBP. The educational aspect of the session covers spinal anatomy and physiology, epidemiology of nonspecific low back pain, exercises, and postural education. The theme is related to participants’ understanding of CLBP as a disease of hard labour, deprivation and rural habitation, specific environmental factors and rural health care facilities. Discussion involves explanation of CLBP as ubiquitous regardless of the level of exposure to biomechanical factors; exploration of good attributes of rural habitation and identifying participants’ ability to influence their own environment, example working from a table rather than the ground.</td>
</tr>
<tr>
<td>2</td>
<td>(Session 2)</td>
<td>Challenging the infective-degenerative explanation of CLBP. The educational aspect of the session covers the epidemiology of specific back pain. This is related to participants’ infective-degenerative understanding of CLBP with explanation that most cases of CLBP are not due to infection. The differences between the symptoms and treatment of specific back pain and non-specific back pain are explored with the application of analogies.</td>
</tr>
<tr>
<td>3</td>
<td>(Session 3)</td>
<td>Challenging negative beliefs and thoughts about back pain including sexuality, fertility, occupational activities and spiritual explanations of CLBP. The educational aspect of the session covers challenging thoughts about back pain. Participants are educated and empowered to challenge and control their thoughts/beliefs and the impact they have on their back pain. Occupational activities and the spiritual understanding of CLBP are explored in group sessions. The utility of spiritual causal explanations of CLBP is compared with spirituality leading to pain acceptance, relinquishment of the sick role and social support. The effect of CLBP on occupational activities and the impact on gender roles are explored with participants. For participants who have questions about the role of CLBP on sexuality and fertility, individual sessions may be used to explore gender roles in terms of sexuality and fertility due to the sensitive nature of this topic. The importance of communication for sexuality should be discussed, and the lack of association between CLBP and fertility in women can be explained. People with fertility problems should be encouraged to visit the hospital and seek medical advice.</td>
</tr>
<tr>
<td>4</td>
<td>(Session 4)</td>
<td>Managing exercise, pacing, goal setting and relaxation, the use of exercise both as a preventive and therapeutic tool in CLBP, and the role of drugs in CLBP. The educational aspect of the session covers managing exercise, pacing, goal setting and relaxation. Participants’ understanding of exercise either as a preventive or therapeutic strategy is explored. The explanation emphasizes how exercise fulfils both roles and the different types of exercises are discussed. This is related to the use of drugs in CLBP with an explanation that drugs are only meant to be used temporarily for short-term relief of</td>
</tr>
</tbody>
</table>
Each of the six programme sessions is divided into six phases as illustrated in Table 7.5 below. The procedures for targeting illness perceptions was informed by a randomised controlled trial of the cognitive treatment of illness perceptions in patients with CLBP (176).
Table 7.5: The six phases of each programme session

| Phase 1 | Education that is collaborative using motivational interviewing principles- obtaining permission from participants and ‘chunk-check-chunk’, that is give a little information at a time, check that this information is understood before giving another bit of information. This is followed by motivation building through engaging participants to describe their concerns and important life goals. Finally, there is agenda setting for the rest of the session. |
| Phase 2 | Mapping of existing illness perceptions using CBT principles of assessment. Participants are stimulated to identify their illness beliefs and link the beliefs into CBT vicious cycle of beliefs/thoughts, mood, physical sensations, and behaviour. |
| Phase 3 | Challenging maladaptive illness perceptions using CBT principles. Participants are encouraged to question their illness perceptions associated with maladaptive behaviour to explore if there is any utility (discovered by participants themselves) in having these perceptions. |
| Phase 4 | Formulation of alternative illness perceptions and associated behaviours using CBT principles of guided discovery. Guided discovery involves participants being encouraged during group sessions to discover by themselves more positive ways of thinking and behaving in relation to their CLBP. Physiotherapist shows an understanding of participants’ point of view and encourages them to discover alternative ways of thinking about their concerns. Socratic dialogue is used to change maladaptive illness perceptions into alternative perceptions conducive to achieving life goals stated in phase 1. |
| Phase 5 | Practising the alternative (desired) behaviour in a supervised session by completing the exercise and postural training sessions. During each session, all the warm-up and cool-down exercises (Figure 7.1) are performed; whereas not all of the main back exercises (Figure 7.2) have to be performed (see Appendix 30 for patient booklet; Appendix 31 for physiotherapist booklet). After the cool down session, correct posture in daily functional activities are practised (Figure 7.3). Participants are encouraged to explore alternative illness perceptions that may support performing exercises and adopting correct posture in daily life. Subsequently, a plan for change is developed with the participants by exploring the incorporation of these activities into their daily lives. Motivational interviewing principles of ‘Elicit-provide-elicit’ are used. Physiotherapist facilitates the change talk by identifying and strengthening comments that show the desire to change, ability to change, reasons for change, need to change, commitment to change and taking steps towards behaviour change. Physiotherapist focuses at an individual level, on the most relevant area for each participant and stimulates the motivation to change by discussing outcome expectancies associated with exercises and correct posture. For |
instance, participants can be told how exercising just before going to bed can improve pain and sleep, and how working from a table instead of the ground can reduce the number of pain episodes. There is exploration of participants’ risk awareness and self-efficacy. Goals to achieve the required behaviour change are set with the participants before the next session. Physiotherapist plans with the participants, the steps required for the exercises and correct posture. Participants are encouraged to remember/record their activities. Social support is used to facilitate behaviour change by allowing each participant to identify a family member or significant other to support the exercises and correct posture.

Phase 6  
Testing of alternative illness perceptions and associated behaviours. Physiotherapist stimulates participants to test alternative illness perceptions and associated behaviours (exercises and correct posture) by using CBT principles of behavioural experiments. Participants practise the behaviour (exercises and correct posture), and appraise their efficacy in their lives. The desired behaviour is strengthened by participants confirming their utility in their daily life. This appears to correspond with the appraisal stage of the SRM (179-181). There is exploration of personal and social/environmental factors that may constitute barriers and facilitators to engaging in the exercises and correct posture. Strategies to utilise the facilitators and reduce barriers to the desired change are explored with the participants. Culturally tailored goals are then set for personalised strategies to overcome the identified barriers. For instance, some participants who may not want to exercise on Sundays for spiritual reasons may be encouraged to exercise in the morning and later in the evening during the previous Saturday.

7.4.4 Physical and informational materials used in the intervention, and training of intervention provider

Patient booklet: This is an illustration-only booklet (Appendix 30). Text is not included in the booklet due to low literacy rates in this rural population. Illustrations include culturally tailored exercise and correct posture during functional activities. Cultural tailoring involved adjusting the appearance of the models to resemble the community members, and including functional activities performed in the rural community, and only exercises that did not require equipment as previously illustrated in Figures 7.1 to 7.3. Farming is a relevant functional activity that was not found in the Nigeria urban back
school model (73) which was included in this programme. Two illustrations for emotional control were also added to the booklet (Appendix 30).

Physiotherapist booklet: This contains the content, detailed procedure for delivering the programme and the rationale. The booklet is designed not only to serve as a manual for delivering the programme but also for training the delivering physiotherapist or health professional. The educational phase of the programme is followed by mapping of existing illness perceptions, challenging maladaptive illness perceptions, formulating alternative illness perceptions and associated behaviours, practicing the exercises and correct posture, and then assessing the utility of these exercises and posture in daily life (Appendix 31).

Mats, chairs, tables, brooms, weights and hoes are used for performing exercises and demonstrating correct posture during functional activities as these are readily available in the locality.

7.4.5 Intervention provider, expertise, background and specific training

The researcher, a physiotherapist, with twelve years of clinical and research experience in physiotherapy, developed and delivered the programme for this thesis. She had received a two-day certified training on CBT and another two-day certified training about motivational interviewing.

The ‘ukwu oma’ programme is only informed by CBT and motivational interviewing, and therefore does not need to be delivered by clinicians with intensive specialist training or by a psychologist. Due to the structured format of the programme, it should be possible for any health professional working in Nigeria (physiotherapists, community health workers, nurses and doctors) to deliver it after minimal training. However, this has yet to be tested. The physiotherapist’s booklet (Appendix 31) could be used in training the health professional that will deliver the intervention.
7.4.6 Intervention adherence and fidelity assessment

Programme fidelity needs to be assured by training the delivering physiotherapist or health professional with the physiotherapist booklet (Appendix 31). To assess programme and implementation fidelity, video recordings of each programme session may need to be assessed independently by members of a multidisciplinary team. Assessments of health professional training and competence, adherence to intervention manual during delivery, intervention receipt, and the extent to which participants apply the skills learnt, will need to be quantified based on a scoring system that will need to be developed (788). The participants’ adherence may need to be assessed in three domains: (1) number of programme sessions attended, and to what extent participants adhered to (2) recommended exercises and (3) correct posture during functional activities.

7.4.7 Modes of delivery

The programme involves face-to-face interactive sessions that combines group exercise and postural training sessions with group and individual discussion sessions supported by instruction manuals and graphic illustrations.

7.4.8 Location, necessary infrastructure or relevant features for intervention delivery

The programme is designed to be delivered in a rural primary health care centre in Nigeria. One room could be used for the discussion sessions and a bigger room for the group exercise sessions. No specific equipment and infrastructure are required for intervention delivery.
7.4.9 Number of times for intervention delivery and period of time required: number of sessions, schedule, duration, intensity or dose

Six sessions are to be delivered once weekly over a period of six weeks. Each session lasts for two hours with an additional thirty-minute break period for refreshment. Each session consists of the educational component (phase 1) that lasts for thirty minutes. This is followed by a break period of fifteen minutes. Then, phases two, three and four last for forty-five minutes. Phase five lasts for twenty-five minutes, followed by another fifteen-minute break. Phase six is the final stage and lasts for 20 minutes.

7.4.10 Tailoring and adapting the intervention: what, why, when and how

Although the ‘ukwu oma’ programme is a group-based self-management programme, behavioural experiments, behaviour-change goals and action plans can be individualised and tailored to suit individual participants. Tailoring will be based on individual life goals and identified barriers and facilitators to behaviour change, highlighted during the interactive group discussions. Regardless of whether CBT is group-based or individual-based, an individualised component has been reported to be an integral component that determines its effectiveness by bridging the intention-behaviour gap (789, 790).

7.5 Discussion

The IM approach has proven useful in the development of a complex behaviour change intervention in rural Nigeria, as in other African contexts such as rural South Africa, urban South Africa and Tanzania (770, 771). The approach enabled the use of theory-based methods and BCTs in intervention development. Self-monitoring, one of the BCTs in the ‘ukwu oma’ programme, which will be encouraged by asking participants to keep a record of their exercises and functional activities, has been found to be very influential in improving physical activity in mostly western developed countries (721). However,
two BCTs labelled as self-assessment of functional consequences (participants asked to explore how their beliefs, thoughts and behaviour influenced their daily functional activities), and regulating negative functional consequences (strategies used to improve daily functional activities) are not in the current taxonomy of 93 BCTs which included emotional consequences and no functional consequences (356). The lack of representation of functional consequences could be because this taxonomy has been developed predominantly from a psychological point of view. This has important implications for the future development of the taxonomy.

Although IM appears very useful in developing evidence-based theory-informed interventions suitable for rural African contexts, the approach is complex, and requires that considerable research is carried out before developing a new intervention. However, the approach may make it easier to adapt developed interventions to other rural African contexts.

7.6 Conclusions

IM has proven useful in bringing together evidence, theory and context in the development of ‘ukwu oma’ programme, aimed at reducing CLBP disability in rural Nigeria.

The next chapter will evaluate the feasibility of this programme in rural Nigeria, which completes the implementation and evaluation steps of the IM approach.
8 Feasibility of ‘Ukwu Oma’ (Good Back) programme for people living with chronic low back pain in rural Nigeria

8.1 Chapter summary

This chapter describes a study conducted to ascertain the feasibility and acceptability of a physiotherapist-led self-management programme for people living with chronic low back pain (CLBP) in a rural Nigerian community (‘ukwu oma’: good back programme). The background section of this chapter (8.2.1) provides the rationale for conducting the study. This is followed by the methods section (8.3) that explains participant recruitment, and quantitative and qualitative data collection and analyses. The results are presented next (section 8.4), and are considered in the discussion section (8.5). Changes that could be made to improve the programme are presented in section 8.6.

The ‘ukwu oma’ programme appeared feasible and acceptable in rural Nigeria, and now merits being tested in a randomised controlled trial (RCT), after acknowledging the recommendations for programme improvement.

8.2 Introduction

8.2.1 Background

There is a lack of effective treatment for CLBP despite the significant burden of CLBP in rural Nigeria (231-235, 245).

Evidence suggests psychosocial factors are important in CLBP disability (79, 138, 140, 141, 152, 156). In rural Nigeria, psychosocial factors, such as illness perceptions and fear
avoidance beliefs, are the most important factors associated with CLBP disability (Study 4) (773). In contrast, CLBP management both in urban-based hospitals and from rural-based alternative health care practitioners is predominantly biomedical with no acknowledgment of psychosocial factors (Study 2) (708).

Evidence suggests that self-management is an effective strategy for managing CLBP (296, 338), and may be particularly useful in rural Nigeria because of its cost effectiveness (246, 287), and ease of access through community-based programmes (287-289). Evidence-based guidelines recommend providing advice and education to promote self-management, combined with physical and psychosocial management which includes cognitive behavioural therapy (CBT) and physical exercise, for people who have substantial disability (9). A systematic review found that integrating psychosocial treatment and physiotherapy improved disability outcomes more than either of these treatments alone (210).

Small to moderate short term effects on pain, disability, mood and catastrophising; and small longer term effects on disability, mood and catastrophising, were reported for CBT when compared with treatment as usual or waiting list controls in a systematic review (207). However, the lack of a coherent theory underpinning most of the interventions in the trials included in this review limits the understanding of the mechanisms through which CBT influenced outcomes. Moreover, no trial in this review was done in a rural African context, which limits the generalisability of these findings to rural Nigeria.

Low literacy and motivation pose barriers to participation in CBT interventions (784), which may be addressed using Motivational Interviewing (MI) (781, 782, 791, 792). MI was found to enhance exercise-related behaviour change in African contexts with mixed literacy levels (750, 753). The addition of MI to exercise-based physiotherapy interventions for CLBP improved motivation and exercise adherence, resulting in long term improvements in disability and pain (793, 794). As suggested in Chapter seven, integrating CBT approaches with MI appears necessary in rural Nigeria, where the effectiveness of CBT informed treatment may be hampered by low literacy rates and the predominantly biomedical model of health care, creating ambivalence to behaviour change.
The ‘ukwu oma’ programme is a physiotherapist-led theory-informed community-based self-management programme developed to challenge maladaptive illness perceptions and coping strategies, and promote more adaptive behaviour (exercises and correct posture) in people living with CLBP in rural Nigeria. The programme has a clear theoretical underpinning (the Leventhal’s self-regulatory model of illness cognitions (179-181)), and has directly targeted predictors of CLBP disability in rural Nigeria (Study 4), as recommended by experts (209). It is the first theoretically underpinned biopsychosocial intervention for CLBP in rural Africa.

As this is a novel intervention, there is a need to assess its acceptability and feasibility in the rural Nigerian community for which it was developed. Feasibility assessment is usually the starting point for such novel programmes to inform future RCTs assessing efficacy (795-797). This chapter follows the recommendations of the conceptual framework for defining feasibility and pilot studies in preparation for randomised controlled trials (797), and extended guidelines for pilot and feasibility studies (795, 798, 799).

8.2.2 Aims of the research

1. Assess the feasibility of ‘ukwu oma’ programme in terms of:
   i. Recruitment rate of eligible participants
   ii. Delivery of the intervention
   iii. Proportion of planned treatment attended
   iv. Retention/dropout rate
   v. Adherence to recommended self-management strategies
   vi. Variability of effect size of the outcome measures: self-reported disability measured with the Roland Morris Disability Questionnaire (Igbo-RMDQ) and secondary outcomes: performance-based disability (BPS), illness perceptions (Igbo-BIPQ), fear avoidance beliefs (Igbo-FABQ), pain intensity (Igbo-11-BS), pain medication use, systolic and diastolic blood pressure.
2. Investigate the acceptability of the programme to people living with CLBP in rural Nigeria.

8.3 Methods

8.3.1 Study design

A small pragmatic non-randomised controlled feasibility study including qualitative individual exit feedback interviews, was designed to test the feasibility and acceptability of ‘ukwu oma’ programme. The plan was to conduct a feasibility study with a randomly selected sample. However, the participants that came to the health centre following the village announcements were mostly the elderly and women. Therefore, random sampling and allocation would not have produced a representative sample of rural Enugu State. Purposive sampling was therefore used to recruit the few available men and younger (18-30 years) participants, who were then assigned into the appropriate study arms.

8.3.2 Ethical considerations

This study was approved by the research ethics committee of King’s College London (Ref: HR-14/15-1565) and the University of Nigeria Teaching Hospital (Ref: UNTH/CSA/329/Vol.5) which is the institutional review board directly in charge of the study setting (Appendix 32).

8.3.3 Study setting

This study took place in a rural primary health care centre in Ozalla in Nkanu West local government area of Enugu State. This setting is a typical rural village that is
predominantly agrarian with most of the population practising peasant or subsistence farming, and is easily accessible from Enugu city.

8.3.4 Participant recruitment

The officers in charge of a rural primary health care centre in Ozalla, Enugu State, South Eastern Nigeria (suggested by the researcher’s Nigerian-based supervisor – Professor Chika Onwasigwe), were approached and the details of the study explained to them. The officers together with the researcher approached the traditional head of the village where the health centre was located and explained the study to him. The traditional head facilitated two village-wide announcements to inform people about the study. The announcements emphasized that only interested people who had chronic back pain would be involved and that there was no obligation to participate in the research. Interested participants were told to meet with the researcher at the village community health centre on a particular day and time.

On the chosen day, the researcher provided information sheets about the study (Appendix 33) to the potential participants at the community centre. A detailed oral explanation of the study was also presented to participants. Explanation about both study arms and the study requirements were provided, and participants were given opportunities to ask questions. It was explained that participation in the study was entirely voluntary and that those who decided not to participate would not be compromised in any way. Potential participants were then advised to take home the information sheets and consent forms (Appendix 34) and to discuss them with their family and friends for two days to decide whether or not to participate in the study. It was emphasized that only those willing to be assigned to either study arm and capable of committing to the entire intervention should return to the health centre on the third day. Participants were informed that they could withdraw from the study at any time and did not have to answer any of the questionnaires. However, for treatment adherence, the importance of attending all sessions was emphasized.
The researcher assessed the potential participants’ eligibility for the study using the screening questions to rule out red flags and specific causes of back pain. Informed consent was subsequently obtained on the third day at the health centre.

### 8.3.5 Screening

Body charts were used to identify the areas of pain (Appendix 8). The screening questions (Appendix 5) were interviewer-administered by the researcher to rule out the ‘red flags’ for CLBP by excluding CLBP associated with underlying serious pathology, radiculopathy or spinal stenosis (32, 33). Diagnosing CLBP in this way is in line with the diagnostic triage recommended by evidence-based guidelines for the management of CLBP (9, 11, 12, 32).

The baseline characteristics of the purposively selected eligible participants were then collected. After this, they were conveniently assigned to either of the two study arms. Convenient assignment involved assigning the participants who indicated that they were available to attend the programme sessions while ensuring that enough male and young (18-30 years) participants were equally represented in both study arms.

#### Inclusion criteria

- Participants aged 18 years and above, with nonspecific CLBP lasting for more than 12 weeks (34).
- Those who were resident in the rural community (Ozalla, Enugu State).

#### Exclusion criteria

- Those who were positive to a simple red flag check list to rule out malignancy, progressive paresis, ankylosing spondylitis, spinal fracture, infection, rheumatoid arthritis and other inflammatory diseases, or cauda equina syndrome.
- Pregnant women as back pain due to pregnancy is not regarded as non-specific.
• People with impaired capacity to give informed consent or participate in the interview. Capacity to give informed consent or participate in the interviews was confirmed by the subjective assessment of speech coherence by the researcher.

8.3.6 Interventions

There were two study arms: the ‘ukwu oma’ self-management programme and usual care (waiting list).

The ‘ukwu oma’ self-management group

This was a physiotherapist-led theory-informed community-based self-management programme for people with CLBP in rural Nigeria. It was designed to challenge maladaptive illness perceptions and behaviours associated with CLBP, and facilitate the adoption of exercise and correct posture to reduce CLBP disability.

The delivery of the programme was informed by an integration of techniques from CBT and MI to challenge maladaptive illness perceptions and communicate/facilitate behaviour change respectively. MI techniques were used to: (1) promote educational aspects of the programme and aid collaborative learning and (2) increase motivation to adopt new behaviour, namely – exercises and correct posture during functional activities. CBT techniques were used to challenge maladaptive CLBP beliefs and behaviour to: (1) reduce maladaptive beliefs and emotions associated with CLBP, and (2) enable the relinquishment of maladaptive behaviours – drug dependence and cure seeking.

The programme was a once weekly self-management programme that combined group and individual sessions that lasted for six weeks. The programme was mainly group-based, with the inclusion of some individual discussion sessions based on participants’ demands, for more intimate topics. There were six different themes, and each weekly session was based on a different theme including: (1) challenging a biomechanical model of CLBP; (2) challenging an infective-degenerative understanding of CLBP; (3) challenging other negative thoughts about back pain; (4) managing exercise, pacing, goal setting and
relaxation; (5) chronic disease and chronic pain; and (6) managing/coping with flare ups, relaxation, help seeking and self-management.

Each programme session has six phases: (1) education about back pain and health care, (2) mapping of existing illness perceptions, (3) challenging maladaptive illness perceptions, (4) formulation of alternative illness perceptions and associated behaviours, (5) practising more adaptive behaviour, like exercise and better posture, in a supervised session, and exploring the incorporation of these into daily lives, and (5) testing and strengthening any alternative illness perceptions by confirming their utility in daily life.

As many of the participants were not literate and would therefore not be able to record their exercises and functional activities in a diary, the Exercise Adherence Rating Scale (EARS) was used. The EARS, a new brief validated measure was administered to assess exercise adherence for a past week at the beginning of each session of the self-management programme (see section 8.3.7). Further details about the programme including the rationale, materials, components and procedures are described in Chapter seven.

The usual care (waiting list) group

No intervention was given to this group until after the feasibility study. This study aimed to compare the feasibility and outcome of the ‘ukwu oma’ programme when compared with usual care, therefore it was necessary that participants in this group were free to take up treatments they would normally use without interference. However, they were given a brief version of the self-management programme after the study had finished so that they would not be too disadvantaged. They were given the same self-help educational materials as those in the self-management programme group but they received no exercise and postural training sessions due to limited field work time. At the end of the feasibility study, all the participants in the self-management and usual care (waiting list) groups were given nutritional supplements and travel expenses. Nutritional supplements were given due to participants’ reports in the study in Chapter two (Study 1) that they lacked access to adequate nutrition. Moreover, the use of nutritional supplements may be more adaptive than prolonged pain medication use.
8.3.7 Outcome assessment

Primary outcomes
The main outcomes for this study were the feasibility and acceptability of the self-management programme. Feasibility was assessed in terms of recruitment rate, delivery of the intervention, proportion of planned treatment attended, retention/dropout rate, adherence to recommended self-management strategies, clinical outcome of disability measured with the Igbo Roland Morris Disability Questionnaire (Igbo-RMDQ). The Igbo-RMDQ is a 24-item self-reported disability measure with a total maximum score of 24 signifying the highest possible disability level and 0 means that there is no disability. Adherence to recommended home exercises was assessed with the exercise adherence rating scale (EARS), a 6-item Likert scale with each item having possible scores of 0 to 4 (800). A maximum score of 24 signifies perfect adherence and lower values reflect poorer adherence.

The acceptability of the self-management programme was ascertained using structured qualitative exit feedback interviews (Appendix 35). Interviews were conducted in Igbo. The questions explored participants’ experiences of the programme, adherence behaviour, understanding of the recommended behaviours and suggestions for improving the programme. The qualitative interview questions were supplemented with questions from the Prescribed Exercise Questionnaire, the 10-item section of the EARS that indicates reasons for adherence/non-adherence (800). Participants’ responses were recorded in English in the paper forms.

Secondary outcomes
The secondary outcomes included: performance-based disability (BPS), illness perceptions (Igbo-BIPQ), fear avoidance beliefs (Igbo-FABQ), pain intensity (Igbo-11-BS), pain medication use, systolic and diastolic blood pressures (see Chapter 4 for detailed description of the outcome measures). Pain medication use was ascertained by simply asking participants to state the number of pain tablets they had ingested in the past two weeks to reduce their back pain. Blood pressure was measured using a mercury
sphygmomanometer as an exercise precaution, and to investigate the influence of the programme on this more objective outcome.

All self-report measures were interviewer-administered.

**Timing of outcome assessment**

Recruitment rate, reflection on the delivery of the intervention, proportion of planned treatment attended and retention/dropout rate were assessed while the self-management programme was ongoing. Almost all primary and secondary outcome measures were administered at baseline and immediately after the programme (on the fifth day after the programme). Exercise adherence for the previous week was assessed at the end of each weekly session of the programme. Acceptability of the programme was assessed immediately after the six weeks’ self-management programme (on the fifth day after the programme).

### 8.3.8 Sample size

Sample size estimation was not required because this was a feasibility study using a purposively selected convenience sample consisting of one group only. Ten was seen as an adequate size for one group of the self-management programme, in line with the Stanford self-management support approach (331, 801) (Chapter 1, section 1.7.3; Chapter 7, section 7.3.4), and the NICE guideline recommendations (9). Thirteen participants were conveniently assigned to the self-management programme group and nine participants to the usual care/waiting list group. This study was not designed to assess effectiveness. Therefore, unequal assignment was done in order to account for an expected higher attrition rate in the self-management group, so at least ten participants would be retained for feasibility and acceptability assessment.
8.3.9 A priori feasibility criteria

To demonstrate proof of principle of the self-management programme, an acceptable effect was set at a low effect size (0.2) (802) in the primary outcome (self-reported disability: Igbo-RMDQ). Scores could then be used to calculate an appropriate sample size for a RCT if favourable. Secondary outcomes, including illness perceptions (Igbo-BIPQ), which were the strongest predictors of CLBP disability in rural Nigeria (Chapter 5), specifically targeted by the programme (Chapter 7), were also expected to have at least a low effect size. RCTs of self-management programmes for painful musculoskeletal conditions have typically recorded effect sizes ranging between 0.2 and 0.7 for pain, disability and psychosocial outcomes (295, 803-806).

An acceptable recruitment rate set at recruiting at least half (50%) of the participants that met the eligibility criteria was chosen as lower values would mean that recruiting an adequate sample size for a future RCT in rural Nigeria might be difficult.

An acceptable level of treatment uptake was set at least 60% of the participants in the self-management group completing all the sessions, and 85% attending at least one session of the self-management programme. Loss of data for analysis was set at not exceeding 35% (10% due to non-compliance and 25% loss to follow-up). These levels were based on established feasibility criteria of a CBT intervention (208, 209).

8.3.10 Intervention delivery

The researcher used the video recordings of all six sessions of the programme to reflect on the delivery of the intervention by determining if the content of each delivered programme session matched the content of the session in the physiotherapist and patient booklets.
8.3.11 Statistical and qualitative data analyses

Data analyses were mainly descriptive focussing on means and 95% confidence interval (CI) estimation, to provide estimates of important parameters to assess in a RCT. Descriptive statistic were performed with SPSS version 22. Participants whose data were analysed completed the study without any major variation in terms of outcome measurements and programme attendance. Data from participants who had deviations from the programme, such as attending only one session out of the six sessions of the programme, were reported separately but included in data analysis. Proportions, percentages, means and standard deviations of pre- and post-test outcome assessments (within-group data) and change scores (between-group data) were presented in tables, figures, and charts. Effect sizes (between-group) were calculated with Hedges’ g and Glass's Δ. Hedges’ g was used because it is a corrected effect size appropriate for small sample sizes, while Glass's Δ was included because it is appropriate where standard deviations are substantially different in the study arms (807).

Qualitative inductive content analysis reflecting a quantitative analysis of meaning (number of people reporting a theme) was performed with NVivo version 10. The qualitative data were analysed using a manifest rather than interpreted content of the interview transcripts (808). This was due to the structured format of the interviews which directly aimed at answering specific questions for programme improvement.
8.4 Results

8.4.1 Participant flow

41 participants came to the health centre following village announcements

33 participants were eligible after screening and all were willing to participate in the study

22 participants were purposively selected to reflect diverse socio-demographic characteristics

13 participants conveniently assigned to the self-management group

9 participants conveniently assigned to the control (waiting list) group

11 participants received nutritional supplements

Not eligible: n=8
2 pregnant women
2 men with congenital deaf/mute mutism
1 woman with febrile illness
2 women with back pain of less than 3 months
1 woman involved in a recent (1 week) road traffic accident

12 analysed
1 dropped out: too busy

8 analysed
1 dropped out: could not afford transport cost

Figure 8.1: Participants’ recruitment process

The flow of participants through each stage is presented in Figure 8.1 above. 41 potential participants came to the village community health centre following the village wide announcements. 33 out of the 41 participants (80%) were eligible after screening using the simple red flag checklist (Appendix 5). All 33 eligible participants (100%) were interested in participating in the study. Among the eligible participants, only six were males. The majority were women, elderly people and farmers. As a small sample size
was needed to assess the feasibility of the self-management programme in one group, 22 participants were selected purposively to reflect diverse socio-demographic characteristics typical of a rural Nigerian community. A random selection was not appropriate as purposive sampling and assignment was needed to ensure that the selection included the few available younger adults, males, traders and civil servants. The 22 selected participants were conveniently assigned to the self-management or control/waiting list group based on their socio-demographic characteristics and availability to attend the weekly programme. Those who wished to attend the weekly sessions were assigned to the self-management group and the rest were assigned to the control/waiting list group.

8.4.2 Baseline data

The baseline characteristics of the participants assigned to the two study arms are presented in Table 8.1 below. Variables such as self-reported disability (Igbo-RMDQ), fear avoidance beliefs (Igbo-FABQ), systolic blood pressure and diastolic blood pressure were balanced in the two groups. Participants were younger in the self-management group, were taking fewer pain tablets, had slightly more years of education, less duration of back pain, higher pain intensity, and lower scores of illness perceptions (Igbo-BIPQ) and performance based disability (BPS). There was no student, Anglican, Methodist or single person in the control group. Co-morbidity was similar in the two groups except that there was a participant with diabetes in the self-management group but none in the control group (Table 8.1).
Table 8.1: Socio-demographic and clinical baseline characteristics by study arm

<table>
<thead>
<tr>
<th>Variables</th>
<th>‘Ukwu oma’ (Good back) programme n=13</th>
<th>Usual care (waiting list) n=9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender: frequency (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>10 (76.9)</td>
<td>6 (66.7)</td>
</tr>
<tr>
<td>Male</td>
<td>3 (23.1)</td>
<td>3 (33.3)</td>
</tr>
<tr>
<td>Age (years): mean (SD)</td>
<td>53.9 (14.1)</td>
<td>60.3 (13.6)</td>
</tr>
<tr>
<td>Education (years): mean (SD)</td>
<td>5.3 (5.4)</td>
<td>4.4 (4.7)</td>
</tr>
<tr>
<td>Marital status: frequency (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>7 (53.8)</td>
<td>5 (55.6)</td>
</tr>
<tr>
<td>Widowed</td>
<td>5 (38.5)</td>
<td>4 (44.4)</td>
</tr>
<tr>
<td>Single</td>
<td>1 (7.7)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Occupation: frequency (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-employed trading/farming</td>
<td>8 (61.5)</td>
<td>6 (66.7)</td>
</tr>
<tr>
<td>Unemployed (health reasons)</td>
<td>3 (23.1)</td>
<td>2 (22.2)</td>
</tr>
<tr>
<td>Student</td>
<td>1 (7.7)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Retired</td>
<td>1 (7.7)</td>
<td>1 (11.1)</td>
</tr>
<tr>
<td>Religion: frequency (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catholic</td>
<td>7 (53.8)</td>
<td>6 (66.7)</td>
</tr>
<tr>
<td>Anglican</td>
<td>3 (23.1)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Methodist</td>
<td>2 (15.4)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Pentecostal</td>
<td>1 (7.7)</td>
<td>3 (33.3)</td>
</tr>
<tr>
<td>Co-morbidity: frequency (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>5 (38.5)</td>
<td>1 (11.1)</td>
</tr>
<tr>
<td>HBP</td>
<td>5 (38.5)</td>
<td>6 (66.7)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>1 (7.7)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Headache+toothache</td>
<td>1 (7.7)</td>
<td>1 (11.1)</td>
</tr>
<tr>
<td>Eye problems</td>
<td>1 (7.7)</td>
<td>1 (11.1)</td>
</tr>
<tr>
<td>CLBP duration (years): mean (SD)</td>
<td>6.8 (4.1)</td>
<td>9.3 (15.4)</td>
</tr>
<tr>
<td>Systolic blood pressure (mmHg): mean (SD)</td>
<td>130.5 (23.5)</td>
<td>130.0 (32.2)</td>
</tr>
<tr>
<td>Diastolic blood pressure (mmHg): mean (SD)</td>
<td>80.7 (9.5)</td>
<td>75.0 (10.5)</td>
</tr>
<tr>
<td>Pain tablets: mean (SD)</td>
<td>17.3 (14.0)</td>
<td>28.2 (34.2)</td>
</tr>
<tr>
<td>Igbo-RMDQ: mean (SD)</td>
<td>17.0 (5.8)</td>
<td>17.8 (4.6)</td>
</tr>
<tr>
<td>Pain intensity (Igbo-11-BS): mean (SD)</td>
<td>6.8 (1.7)</td>
<td>5.3 (1.6)</td>
</tr>
<tr>
<td>Igbo-BIPQ: mean (SD)</td>
<td>34.9 (10.7)</td>
<td>41.1 (9.7)</td>
</tr>
<tr>
<td>Igbo-FABQ: mean (SD)</td>
<td>64.0 (21.9)</td>
<td>65.3 (15.8)</td>
</tr>
<tr>
<td>BPS: mean (SD)</td>
<td>3.2 (2.1)</td>
<td>4.6 (2.7)</td>
</tr>
</tbody>
</table>

SD: standard deviation
8.4.3 Reflections on the delivery of the self-management programme

The programme was delivered at a rural primary health care centre (Figure 8.2) by the researcher – a physiotherapist with twelve years of clinical experience who had received four days training in CBT and MI prior to the study. Each programme session lasted approximately two hours with additional 30 minutes of break periods as was planned a-priori (Chapter 7, sections 7.4.3 and 7.4.9). Reflections on delivery by the researcher and viewings of the recordings indicated that the content of each programme session matched the content of the corresponding session in the physiotherapist’s and patient’s booklets. Further details of the principles, procedures, activities, and processes used in the programme are described in Chapter seven.

Figure 8.2: Participants during the group self-management programme in the rural primary health care centre
8.4.4 Proportion of planned treatment attended

The proportion of planned treatment attended is presented in Table 8.2 below. Attendance rate for the programme was 83% (65/78). The proportion of participants that attended all sessions of the programme (100% attendance) was 10/13 (77%). 92% (12/13) attended at least one session of the programme. One female participant did not come to any of the six sessions of the programme because she was too busy (Figure 8.1). Of the three males in the self-management group, one attended only half (before phase five) of one session out of the six sessions. Another male participant came late for two sessions (after phase four and during phase one). The third male left after phase four in one session, was late during phase four in one session, and came late during phase one of another session.

Table 8.2: Attendance at the programme sessions

<table>
<thead>
<tr>
<th>Participants' S/N</th>
<th>Session 1</th>
<th>Session 2</th>
<th>Session 3</th>
<th>Session 4</th>
<th>Session 5</th>
<th>Session 6</th>
<th>Total number of sessions attended by each participant</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>x</td>
<td>✓</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<td>✓</td>
<td>✓</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>6</td>
</tr>
<tr>
<td>9</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>6</td>
</tr>
<tr>
<td>10</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>6</td>
</tr>
<tr>
<td>11</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>6</td>
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<td>12</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>6</td>
</tr>
<tr>
<td>13</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>6</td>
</tr>
<tr>
<td>Total number of participants at each session</td>
<td>11</td>
<td>12</td>
<td>11</td>
<td>10</td>
<td>10</td>
<td>11</td>
<td>65/78 (83%)</td>
</tr>
</tbody>
</table>
8.4.5 Retention/dropout rate

Retention rate for the self-management programme was 92% (12/13) while dropout rate (loss to follow-up) was 8% in the self-management group and 11% in the usual care/waiting list group as one participant was lost from each group (Figure 8.1). Questionnaire and objective assessment completion time appeared acceptable to the participants as none complained of long completion time.

8.4.6 Adherence to recommended self-management strategies

There was some cross over between groups as one control group participant had a wife in the self-management group. He reported doing the exercises with his wife at home.

The means and standard deviations of the EARS following each of the six sessions of the self-management programme were: 15.9 (5.2); 17.9 (4.5); 18.4 (4.9); 16.6 (6.0); 20.6 (3.7) and 20.5 (2.9). There was a trend for exercise adherence to increase with the first few sessions of the programme, reduce back to the starting values in the mid sessions and then increase beyond the starting values with subsequent sessions of the programme (Figure 8.3).

Figure 8.3: Time series plot of the mean exercise adherence for each week against each of the six sessions of the programme
The predominant reasons for not adhering to the exercises according to the Prescribed Exercise Questionnaire, the 10-item section of the EARS were item 1 (6 sessions)- *I don’t have time to do my exercises*; item 2 (6 sessions)- *Other commitments prevent me from doing my exercises*; item 10 (3 sessions)- *I’m not sure how to do my exercises*. Item 7 (1 session)- *I do my exercises because I enjoy them*, was given as a reason for performing the exercises.

8.4.7 Proof of principle, outcomes and estimation (effect sizes)

Table 8.3 below shows that there were improvements in all outcomes with the most marked changes seen in illness perceptions (Igbo-BIPQ), self-reported disability (Igbo-RMDQ), fear avoidance beliefs (Igbo-FABQ) and pain intensity (Igbo-11-BS). The least improvements were seen in diastolic and systolic blood pressure. There were large (≥0.8) effect sizes observed for self-reported disability, performance-based disability (BPS), illness perceptions, fear avoidance beliefs, pain intensity and the number of pain tablets ingested. Medium (0.5) and small (0.2) effect sizes were observed for systolic blood pressure (SBP) and diastolic blood pressure (DBP) respectively.
Table 8.3: Means and Effect sizes in the self-management and usual care/waiting list groups

<table>
<thead>
<tr>
<th>Variables</th>
<th>Post-test mean values (SD)</th>
<th>Within-group/Pre- and post-test mean differences (SD)</th>
<th>95% Confidence intervals of within-group mean differences</th>
<th>Between-group mean differences</th>
<th>95% Confidence intervals of between-group differences</th>
<th>Between-group effect sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Hedges’ g (Glass’s Δ)</td>
</tr>
<tr>
<td></td>
<td>'Ukwu oma' (Good back) programme n=12</td>
<td>Usual care (waiting list) n=8</td>
<td>'Ukwu oma' (Good back) programme n=12</td>
<td>'Ukwu oma' (Good back) programme n=12</td>
<td>Usual care (waiting list) n=8</td>
<td></td>
</tr>
<tr>
<td>Igbo-RMDQ</td>
<td>7.0 (4.2)</td>
<td>19.6 (5.6)</td>
<td>-9.8 (4.8)</td>
<td>1.5 (3.9)</td>
<td>-12.8, -6.7</td>
<td>-18.4, -10.6</td>
</tr>
<tr>
<td>BPS</td>
<td>2.1 (1.6)</td>
<td>4.6 (2.7)</td>
<td>-0.8 (1.3)</td>
<td>0.3 (2.8)</td>
<td>-1.6, -0.03</td>
<td>-3.3, -0.8</td>
</tr>
<tr>
<td>Igbo-BIPQ</td>
<td>13.5 (9.5)</td>
<td>45.6 (15.1)</td>
<td>-21.6 (15.2)</td>
<td>3.8 (7.5)</td>
<td>-31.3, -11.9</td>
<td>-41.7, -0.6</td>
</tr>
<tr>
<td>Igbo-FABQ</td>
<td>20.3 (15.9)</td>
<td>73.5 (28.5)</td>
<td>-41.7 (27.6)</td>
<td>7.8 (35.8)</td>
<td>-59.2, -24.1</td>
<td>-71.8, -10.7</td>
</tr>
<tr>
<td>Igbo-11-BS</td>
<td>2.8 (1.3)</td>
<td>7.0 (2.5)</td>
<td>-3.8 (2.1)</td>
<td>1.5 (3.1)</td>
<td>-5.2, -2.5</td>
<td>-7.7, -1.9</td>
</tr>
<tr>
<td>Number of Pain tablets</td>
<td>3.2 (5.0)</td>
<td>28.5 (37.8)</td>
<td>-14.6 (12.1)</td>
<td>-2.8 (20.3)</td>
<td>-22.3, -6.9</td>
<td>-30.9, -3.9</td>
</tr>
<tr>
<td>SBP (mmHg)</td>
<td>118.3 (11.6)</td>
<td>131.3 (30.0)</td>
<td>-12.5 (23.7)</td>
<td>2.0 (35.6)</td>
<td>-29.5, 4.5</td>
<td>-37.7, 0.9</td>
</tr>
<tr>
<td>DBP (mmHg)</td>
<td>70.8 (13.3)</td>
<td>75.6 (15.0)</td>
<td>-5.8 (14.4)</td>
<td>0.0 (10.0)</td>
<td>-16.1, 4.5</td>
<td>-24.7, 1.4</td>
</tr>
</tbody>
</table>

SBP = systolic blood pressure; DBP = diastolic blood pressure
Table 8.4: Baseline outcome scores and mean changes by gender in the self-management group

<table>
<thead>
<tr>
<th>Variables</th>
<th>Males</th>
<th>n=3</th>
<th>Females</th>
<th>n=9</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean baseline values (SD)</td>
<td>Pre-post-test mean changes (SD)</td>
<td>95% confidence intervals</td>
<td>Mean baseline values (SD)</td>
</tr>
<tr>
<td>Igbo-RMDQ</td>
<td>14.5 (5.5)</td>
<td>-1.8 (7.2)</td>
<td>-9.4, 5.7</td>
<td>18.4 (4.9)</td>
</tr>
<tr>
<td>BPS</td>
<td>3.3 (2.9)</td>
<td>0.7 (2.8)</td>
<td>-2.3, 3.6</td>
<td>3.9 (2.2)</td>
</tr>
<tr>
<td>Igbo-BIPQ</td>
<td>31.8 (8.9)</td>
<td>-3.7 (10.2)</td>
<td>-14.3, 7.0</td>
<td>39.5 (10.6)</td>
</tr>
<tr>
<td>Igbo-FABQ</td>
<td>52.7 (19.2)</td>
<td>-10.8 (34.7)</td>
<td>-47.3, 25.6</td>
<td>69.0 (17.8)</td>
</tr>
<tr>
<td>Igbo-11-BS</td>
<td>5.3 (1.2)</td>
<td>-0.5 (3.0)</td>
<td>-3.7, 2.7</td>
<td>6.5 (1.9)</td>
</tr>
<tr>
<td>Number of Pain tablets</td>
<td>27.3 (14.6)</td>
<td>-20.5 (16.4)</td>
<td>-37.7, -3.3</td>
<td>19.7 (27.1)</td>
</tr>
<tr>
<td>SBP (mmHg)</td>
<td>138.0 (24.9)</td>
<td>0.0 (35.4)</td>
<td>-43.9, 43.9</td>
<td>127.1 (26.7)</td>
</tr>
<tr>
<td>DBP (mmHg)</td>
<td>84.0 (5.5)</td>
<td>-4.0 (11.4)</td>
<td>-18.2, 10.2</td>
<td>76.5 (10.7)</td>
</tr>
<tr>
<td>Post-test mean score (SD)</td>
<td>21.4 (3.7)</td>
<td>17.0 (3.8)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SBP= systolic blood pressure; DBP= diastolic blood pressure

The male participants had poorer programme attendance than the females. Therefore, in Table 8.4 above, mean baseline and change scores were split by gender to assess if gender-related programme attendance influenced outcomes. The female participants had much greater improvements, with more precise estimates in all the assessed outcomes, except for the number of pain tablets taken and diastolic blood pressure. Mean change in self-reported disability was clinically important for the females but was not for the males. The number of pain tablets taken by the male participants was more reduced than for the female participants. Diastolic blood pressure was almost similarly improved in the male and female participants. Notably there was no change in systolic blood pressure, and performance-based disability slightly increased rather than reduced in the male participants. Female participants had slightly higher baseline scores in self-reported disability, performance-based disability, illness perceptions, fear avoidance beliefs, and pain intensity. The male participants had slightly higher baseline scores in the number of pain tablets ingested, systolic and diastolic blood pressure. Additionally,
the male participants had a higher exercise adherence score (EARS) than the females (Table 8.4).

### 8.4.8 Participants’ experiences and the acceptability of the ‘ukwoma’ programme

Four themes and thirteen subthemes were generated from the inductive content analysis of the interviews (Table 8.5 below).

**1. Positive perceptions of the self-management programme**

All respondents that participated in the self-management programme expressed positive views about the programme for different reasons.

**Group structure of the programme was valued**

All but one of the respondents that participated in the programme preferred a group-based programme incorporating the demonstration of exercises and correct posture for functional activities. They reported that these groups facilitated social support, collaborative learning and fun activities.

‘It is better group-based because it enables you to see other people having the condition and also learn from other people’ (P1, male, 67 years, retired teacher); ‘it makes it fun during the group exercise sessions’ (P13, male, 54 years, trader).

One participant understood group programmes as interventions with an increased level of importance.

*I prefer things that are done in a group because it shows that such things are important* (P6, female, 70 years, farmer).

The only participant who did not like a group format attended only half of one session (before phase 4) out of the six sessions of the programme. He was not aware of the individual discussion sessions in the programme. He was also by far the youngest participant.

*I didn’t like it being group-based because I am a shy person* (P2, male, 24 years, student).
Table 8.5: Themes from the qualitative feedback interviews

<table>
<thead>
<tr>
<th>Themes</th>
<th>Positive perceptions of the self-management programme</th>
<th>Good understanding of recommended self-management strategies</th>
<th>Adherence behaviour</th>
<th>Recommendations for improving the programme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subthemes</td>
<td>Group structure of the programme was valued</td>
<td>Behaviour change as an ongoing process</td>
<td>Improvement of symptoms may have the strongest influence on adherence behaviour</td>
<td>Changes in programme structure and delivery</td>
</tr>
<tr>
<td></td>
<td>Improvements in participants’ symptoms positively influenced their views of the programme</td>
<td>Exercises as part of daily life</td>
<td>Expecting improvement of symptoms may be important for adherence</td>
<td>Primary health care facility modification</td>
</tr>
<tr>
<td></td>
<td>Health professional-led intervention delivered in health centres was advocated</td>
<td></td>
<td>Adherence was facilitated by interesting practice sessions with self-help educational materials</td>
<td>Changes at the community level</td>
</tr>
<tr>
<td></td>
<td>Enhancing participants’ knowledge of chronic low back pain via a collaborative communication style was appreciated</td>
<td></td>
<td>Non-adherence was related to contextual personal factors</td>
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However, all participants reported being mocked and laughed at by community members, including people in the control group, because they were performing exercises which were not regarded as legitimate treatment in rural Nigeria (reflective diary, 02/11/2015; see also Chapter 2, section 2.4.2; Appendix 36). Some female participants became reluctant to wear shorts or trousers for the exercise sessions as they were trying to conceal that they were doing exercises for their back pain to avoid being mocked.

‘they were saying, where are the drugs you were given for your pain? then they said, you are just going to the health centre to play... ‘(P10, female, 35 years, trader).

**Improvements in participants’ symptoms positively influenced their views of the programme**

Eight participants reported that their main reasons for liking the programme was because it reduced their back pain, increased their functional ability and sense of well-being.

‘I liked the treatment because it made me get some relief from my back pain. I also learnt how to have hope that things will get better despite my pain’ (P3, female, 65 years, farmer); ‘...my pain has got better since I started the programme’ (P7, female, 40 years, unemployed for health reasons).

One of the eight participants reported that he no longer depended on drugs to perform his daily activities, and likened the effects of the programme to that obtained from analgesic drugs.

*The programme is good...in fact, it is like I am taking drugs because after the exercises I become fit to do my work (P13, male, 54 years, trader).*

**Health professional-led intervention delivered in health centres was advocated**

All the participants that attended the programme preferred the programme to be delivered by health professionals in the health centres. They believed that only health professionals had the pre-requisite knowledge, skills and experience to deliver the programme.
‘A health professional is the only person that we will believe what s/he says’ (P10, female, 35 years, trader); ‘I prefer a health professional because a health professional can tell us the right things to be doing’ (P2, male, 24 years, student).

Two of these participants were more specific in advocating for a health professional with expertise in exercise therapy or who has CLBP because they believed such people will be more competent in delivering the intervention.

‘A health professional trained in exercise treatment is better’ (P12, female, 61 years, unemployed for health reasons); ‘I prefer a health professional who also has back pain to deliver the programme’ (P6, female, 70 years, farmer).

All but one of the participants did not want a lay person delivering the intervention due to a perceived lack of expertise and experience.

‘A lay person will not be as knowledgeable and patient as a health professional and will not be respected by patients’ (P7, female, 40 years, unemployed for health reasons).

The only participant that did not mind a lay person delivering the intervention in the health centre believed that lay people may be useful due to the perceived time constraints of health professionals.

‘We may accept a trained lay person because a lay person may have more time than a health professional’ (P1, male, 67 years, retired teacher).

Programmes delivered in primary health care centres may be preferred for legitimacy and accessibility.

‘Health centre is best because it is a known place for managing health. Going to the field or community centre will make the programme not to be perceived as serious (P13, male, 54 years, trader); Health centre is best because it is in our village and close to us (P9, female, 65 years, farmer).

Enhancing participants’ knowledge of chronic low back pain via a collaborative communication style was appreciated

Three participants acknowledged and appreciated improvements in their knowledge of CLBP due to the collaborative communication style that provided the opportunity to converse with and question the health professional. This style of communication enabled participants to present and defend their ideas, exchange varied beliefs and be actively engaged during the sessions.
What I liked best about the treatment is how you asked us questions and we answered them which helped us understand things better (P6, female, 70 years, farmer).

This improvement in the knowledge about CLBP and the management strategies was reported as the underlying factor that reduced drug dependence in one participant.

‘This programme helped me a lot, I used to take drugs all the time...I didn’t know about exercises, but now I use exercises for my back pain and I no longer take pain killing drugs all the time’ (P5, female, 51 years, trader).

2. Good understanding of recommended self-management strategies
Exploring the participants understanding of the recommended self-management strategies in terms of duration and frequency using structured questions showed that they understood the recommendations.

Behavior change as an ongoing process
All the participants that attended the programme understood that the recommended self-management strategies were meant to be permanent in their lives.

Exercises as part of daily life
All but two participants understood that exercises should be a part of their daily life. One of these participants with a poor understanding was the one that attended only half of one session (before phase 4) out of the six sessions of the programme.

3. Adherence behaviour
Most of the participants reported adhering to the recommended self-management strategies. An exploration of the factors that improved or hindered adherence to the recommended self-management strategies revealed a multitude of reasons.
Improvement of symptoms may have the strongest influence on adherence behaviour

The participants’ most cited reason for good adherence was because they experienced a reduction in back pain symptoms as well as improvements in the symptoms they associated with their co-morbid chronic health conditions, such as hypertension and diabetes. They reported improved feelings of well-being, functional ability, hopefulness and sleep. Eight participants stated this as their main reason.

‘I sleep well at night since I started coming for this programme’ (P9, female, 65 years, farmer); ‘I did the exercises because things I could not do before, I can do them now’ (P11, female, 64 years, farmer).

Expecting improvement of symptoms may be important for adherence

Four participants reported that their reasons for carrying out the recommended self-management strategies were due to expectations that these strategies would be helpful for their chronic pain, co-morbid chronic conditions and general health in the long term.

‘I was doing my exercises because I believe they will help’ (P9, female, 65 years, farmer).

One out of these four participants had co-morbid hypertension which she reported reduced her exercise adherence.

Prior to participating in this programme, this participant resisted engaging in physical exercises which she perceived as dangerous for her health based on her understanding of her doctor’s instructions.

‘My doctor told me to rest always...to avoid stress...’ (P8, female, 60 years, unemployed for health reasons).

Another one of these four participants attended only half of one session out of the six sessions of the programme and still had expectations of being cured by the programme.

‘I was doing the exercises because I need to get healed’ (P2, male, 24 years, student).

Adherence was facilitated by interesting practice sessions with self-help educational materials

Three participants reported that they did the recommended self-management strategies due to the training and the self-help educational materials they received
during the practice sessions which increased their understanding of what was required. The engaging practice sessions made them enjoy the programme and increased their desire to maintain the recommended strategies.

‘I was doing the exercises because I have the pamphlet’ (P2, male, 24 years, student); ‘I did the exercises because I understood them and started enjoying them...the sessions were fun’ (P7, female, 40 years, unemployed for health reasons).

Non-adherence was related to contextual personal factors

Although most of the participants had adhered well to the recommended self-management strategies, a few had poor exercise adherence which appeared to be influenced mainly by the presence of chronic co-morbid conditions, such as hypertension and diabetes, younger age or poor attendance at the programme. One obese participant with hypertension and diabetes did not do many of the exercises because she believed that exercises were dangerous for her. This perception was in line with her understanding of her doctor’s recommendations. She believed that performing exercises would increase her symptoms of hypertension.

‘I do not do all my exercises because of my dizziness due to my hypertension’ (P8, female, 60 years, unemployed for health reasons)

The only participant that was a young student reported that his poor attendance was as a result of lack of time.

‘I did not do the exercises because of my studies at the National Open University’ (P2, male, 24 years, student).

Four participants had their adherence temporarily reduced by acute conditions including typhoid fever, malaria, domestic accident and increased pain. One participant’s adherence appeared to be influenced by the day of the week.

‘I don’t do my exercises on Sundays because I have to prepare for church but I do them on other days’ (P6, female, 70 years, farmer).
4. **Recommendations for improving the programme**

Most of the participants made some suggestions to improve the programme which included:

**Changes in programme structure and delivery**

All the participants recommended that the programme should be ongoing and permanent in the health centres and done on particular days. Three participants requested that the duration of each session of the programme should be shortened to allow it to be finished in time for them to collect their children from school.

> ‘I prefer that the duration of the SMP for each day is shortened so that it ends before school children finish from school’ (P6, female, 70 years, farmer).

One participant suggested the inclusion of videos demonstrating the recommended activities in the self-help educational materials. This could simulate the group practice sessions, improve understanding of the recommended self-management strategies and enhance long term adherence.

> ‘Including a video showing how to do the exercises which we can use at home ...so that we can continue using it when the programme is over’ (P10, female, 35 years, trader).

**Primary health care facility modification**

Two participants suggested that bigger rooms with equipment should be provided in the health centres to improve the group exercise sessions.

> ‘get a bigger place for the exercise sessions to allow more movements during the warm up exercises’ (P1, male, 67 years, retired teacher); ‘including some gym equipment will make the programme better’ (P13, male, 54 years, trader).

**Changes at the community level**

Participants felt that changes at the community level would enhance the impact of the programme. For instance, three participants felt that increasing awareness about the programme and the benefits of exercise would enhance the programme’s effectiveness.
One participant suggested that the mass media could be a potentially effective source of enlightenment about exercises.

‘Raising awareness about the programme so that more people know about the programme will improve its usefulness’ (P1, male, 67 years, retired teacher); ‘...broadcasting it (the programme) on specific days on the radio to give people education about exercises will be very good’ (P10, female, 35 years, trader).

Another participant suggested the provision of village community recreational centres for people with back pain to complement the self-management programme at the health centres.

8.5 Discussion

8.5.1 Summary and interpretation of findings

This is the first study to attempt to treat people with CLBP in rural Nigeria with a novel theory-informed biopsychosocial intervention involving exercise. The feasibility of ‘ukwu oma’ programme was demonstrated in the domains of recruitment, intervention delivery, treatment uptake, participants’ retention, adherence to self-management strategies, and effect sizes. The programme was found to be acceptable in this study in a village in rural Nigeria. It is also important to note that no direct comparisons can be made with other studies, due to the lack of previous research in this area.

Recruitment rate for the eligible participants was very high at 100% (all the eligible participants wanted to participate), compared to some studies in developed countries, such as the UK and USA, where recruitment rate ranged between 55-90% (209, 255, 809-811). However, this was a much smaller study and so results need to be interpreted with caution. This could also be because this population is understudied and lacked effective health care options which may have increased motivation to participate in the study. Another reason could be the direct community recruitment strategy in this study, as opposed to participant recruitment with the health care system acting as a ‘gate keeper’. However, direct community recruitment has not always increased recruitment in the United States (809). Although overall the recruitment rate was good in this study, male
and younger participants were difficult to recruit, as only a few came to the primary health centre in response to the village announcements. Future studies may improve this by using stratification based on gender and age, and recruit from different villages to ensure a more representative sample of rural Nigeria.

Convenient assignment to the study arms could have reduced the attrition rates by ensuring that the most motivated people participated in the self-management programme. Some evidence suggests that attrition rates are reduced by acknowledging patient preferences during group assignment, as observed in randomised consent designs and cohort randomised controlled trials (812). Future RCTs in rural Nigeria might incorporate patient preferences in terms of group allocation within randomisation to reduce attrition while maintaining the equality of both study arms. However, this is a more complex design, and may not make much difference. The short follow-up period immediately post-intervention could have minimised the attrition rates observed in this study. The attrition rates in rural Nigeria need to be clarified by future studies with longer follow-up periods.

Incentives (meals and travel expenses) combined with engaging group practice sessions and improved knowledge about CLBP, may have improved attendance rates in this study, as suggested by the qualitative results. The acceptability of the programme was high, as all the participants reported they preferred the programme over usual care. However, as the researcher collected this data herself, it is possible this was inflated by self-presentation bias or that participants felt unable to voice negative comments.

The overall attendance at the programme was 83%, comparable with the 83.8% and 81% attendance at a mindfulness-based meditation program for community dwelling older adults with CLBP in the USA (809), and exercise-based rehabilitation programme for chronic hip pain in the UK (811) respectively. However, male and younger participants seemed less interested in attending the sessions. The youngest male participant had the worst attendance and adherence. He was the only participant that did not like the group structure of the programme. This could be because the majority of the participants were older women. An equal representation based on gender and age in a self-management group may ameliorate this in future studies. The other two male participants were late or left before the end of many sessions suggesting that this
intervention may need to be tailored to improve attendance in these subgroups. Alternatively, a group could be run specifically for men.

Exercise adherence measured with the EARS in this study was higher than in patients with CLBP involved in the development of this measure in the UK (800). This could be due to one or more of the following reasons. The intervention in this study increased exercise adherence possibly due to the combination of a relevant theory, and it being informed by CBT and MI. Assessing adherence between sessions and immediately after the programme may have increased adherence scores, whereas a longer follow-up period may have reduced exercise adherence scores. Exercise as ‘treatment’ is new in this context, and this may have made it seem more appealing and increased motivation. However, participants’ interview responses suggested that the reverse may have been the case because the community’s lack of regard for exercises as legitimate treatment for CLBP may inhibit long term exercise-related behaviour change. Self-presentation bias may have inflated outcomes because exercise adherence was self-reported via interviewer-administration by the researcher. A lack of understanding of the concept of ‘exercise adherence’ may be another reason for positive outcomes, although this is unlikely based on the results of the qualitative interviews.

Longer follow-up periods and assessment by an independent blinded assessor will need to be investigated in future studies in rural Nigeria. These studies may need to ascertain the impact of targeting community beliefs and attitudes towards exercise on long term exercise-related behaviour in rural Nigeria. Findings from the qualitative study suggest that the improvements in participants’ symptoms may have been the strongest determinant of both attendance at the programme and exercise adherence. This implies that future trials in this context must deliver interventions at a dose and duration sufficient to improve participants’ symptoms as seemed to be achieved in the ‘ukwuma’ programme, before participants are followed up.

The qualitative finding that actual improvements in symptoms may be important in sustaining exercise-related behaviour change in rural Nigeria supports evidence suggesting that individuals with the best rehabilitation outcomes were more likely to maintain exercise (265). It is therefore unlikely that brief educational interventions without exercise demonstrations and practice will be effective in rural Nigeria. The improvement in symptoms may have stimulated the participants’ autonomous
motivation and self-belief in the benefits of exercises, as has been reported elsewhere (812). Additionally, the combined group and individual discussion sessions using techniques from CBT and MI may have further increased autonomous motivation. This may have occurred through a collaborative communication style and a more patient-centred social environment, where participants’ experiences and views were respected, while the researcher provided necessary information about CLBP, as suggested in the literature (812).

The male participants appeared to score more highly than the females on the exercise adherence rating scale, although numbers were very small so findings must be interpreted with care. In contrast, gender was not associated with home-based exercise adherence in a Nigerian based study that found that discomfort, physiotherapist dependency (for treatment) and participants’ personal barriers influenced home exercise adherence (474). However, the study was a cross-sectional survey of stroke patients attending outpatient physiotherapy in North-western Nigeria whereas the participants in this study had CLBP and were recruited from a rural community in South-eastern Nigeria. Moreover, participants’ personal barriers and physiotherapist dependency were targeted in the ‘ukwu oma’ programme.

The remarkable reduction in key outcomes, such as illness perceptions, self-reported disability, fear avoidance beliefs, pain intensity and pain medication use suggests that the programme’s mechanism of change may be in line with the Leventhal’s self-regulatory model (SRM) of illness cognitions. Thus, modification of illness perceptions may have modified coping strategies and emotions and so influenced disability (179, 181). However, effect sizes may have been moderated by the unequal baseline scores in the intervention and control groups due to a non-randomised design which could not be adjusted for due to a small sample size. However, the baseline values of self-reported disability and fear avoidance beliefs were balanced in the two groups. Due to the small sample size, there was no assessment of emotions and many coping strategies which may need to be addressed in a larger trial to clarify if the mechanisms of change seen here are in line with the SRM (179, 181). Therefore, large studies may need to isolate the effects of behavioural coping strategies (e.g.s exercise adherence, correct posture during functional activities, and drug dependence) and psychosocial factors (e.g.s illness perceptions, fear avoidance beliefs, catastrophising) on both self-reported and
performance based disability, while controlling for gender and baseline outcomes as covariates in analysis.

Self-reported disability reduced more than performance-based disability. This result could be because performance-based disability may be less prone to self-presentation bias than self-reported disability. Another reason could be that self-reported disability measured with the Igbo-RMDQ may have been better able to capture improvements made by the programme than the more impairment focused performance-based disability measure.

In contrast to the females, performance-based disability slightly increased rather than reduced in the male participants even though they reported they were more adherent to the exercises. This may be related to the fact that the male participants missed most of the group discussion sessions where psychosocial factors were specifically targeted. However, this finding may be tempered by their smaller baseline scores in the psychosocial factors. The very small sample size in this study means that this result must be interpreted with extreme caution. Moreover, exercises were the only behavioural outcomes that were assessed, and adopting correct posture during functional activities which was a target of the programme could not be assessed as there was no available measure for it (813). It is also possible that there were other coping strategies adopted or relinquished because of the programme which could not be captured, and may explain these results.

Despite having poorer exercise adherence than the male participants, the female participants had remarkably better outcomes with more precise estimates in all the assessed outcomes, except for pain medication use and blood pressure. The female participants had higher baseline scores in all the other variables except blood pressure and pain medication use. The male participants had higher baseline values for pain medication use, systolic and diastolic blood pressure, and reported greater reductions than the females in pain medication use and diastolic blood pressure only.

The programme’s reported reduction in pain medication use, most of which were opioids such as tramadol (reflective diary: 10/9/2013 and 02/11/2015), may be of public health importance. However, some direct evidence of this would also be helpful. The long-term use of opioids increases cardiovascular risk and has limited effectiveness for
CLBP (247). Depending on drugs to manage CLBP is a salient maladaptive coping strategy in this population with high prevalence of co-morbid chronic conditions such as hypertension and diabetes (376).

The unexpected improvements in systolic blood pressure, especially in the females, may be due to the positive effects of the group sessions and exercise on blood pressure (814-816). However, there was no change in systolic blood pressure in the males, who reported better exercise adherence but had worse attendance at the psychosocial sessions. Therefore, targeting psychosocial factors as well as exercise may have modified pain experience and reduced stress, which may have reduced blood pressure (19). In this study, females who had better attendance at the psychosocial sessions and more changes in psychosocial factors, had better reductions in systolic blood pressure. This finding also needs to be interpreted with caution due to the very small number of male participants. Evidence suggests that psychosocial stress, sometimes increased by pain (19), contributes to hypertension and cardiovascular disease, and that stress reduction reduces blood pressure (817). Improvements in blood pressure may have also occurred through participants’ better adherence to antihypertensive drugs. This may have been facilitated during the programme’s discussion sessions that explored medication use in the self-management of CLBP and common chronic conditions in rural Nigeria including hypertension and diabetes (Chapter 7, section 7.4.3).

### 8.5.2 Limitations

The inability to use a random sampling method to recruit participants combined with the small sample size, makes this sample unlikely to be representative of rural Nigeria. Non-randomisation led to imbalanced study arms possibly impacting on some effect sizes which need to be interpreted with caution. Lack of assessor blinding and the fact that many outcomes were self-reported via interviewer-administration by the researcher who conducted the programme may well have inflated effect sizes. Moreover, as suggested in Chapter four, high measurement errors may have been introduced by low literacy rates and interviewer-administration in place of self-administration. Effect sizes must therefore be interpreted with caution in the context of
the high measurement errors of these outcomes in rural Nigeria. The EARS was interviewer-administered without cross-cultural adaptation, which may have affected exercise adherence outcomes. A short follow up period is a limitation that may have inflated adherence and effect sizes. There was minimal contamination in one participant which could be reduced by cluster randomisation in a future trial. Another important limitation was that the researcher who developed the programme was also the clinician delivering it, so it is unclear from this study whether another clinician without training and experience in the UK would be able to deliver it. More exploration of the necessary training and supervision of clinicians in Nigeria would be essential before rolling it out. These potential limitations will therefore need to be addressed in any future study.

8.5.3 Conclusions and overall evidence of feasibility

The ‘ukwu oma’ self-management programme seemed feasible and acceptable, resulting in positive behaviour changes. The programme demonstrated promising preliminary results in rural Nigeria. The programme should be tested further in more studies after the requested modifications to the programme, in line with patient-centred care (9).

8.6 Refined ‘ukwu oma’ self-management programme

8.6.1 Modifications to the programme

The refined programme is presented in Table 8.7 below. In response to the participants’ recommendations, the following minor modifications (in bold) were made to the programme:

1. Programme structure and delivery: the programme may need to be ongoing or have booster sessions and be timed to end by one pm before primary school dismissal to allow individuals to collect their children from school. There should be inclusion of videos of the models practicing the exercises and correct posture
demonstrated during the programme sessions. Every participant in the self-management programme should be given a video and a patient booklet at the start of the programme.

2. Primary health care facility: a bigger room or an open space that will allow free movement during the exercise and postural training sessions is required to deliver the programme.

3. Changes at the community level: it may be important to try to influence the rural communities’ beliefs and attitudes towards exercises and correct posture as management strategies for CLBP in order to support exercise-related behaviour change, especially when the programme sessions are over. People were mocked for adopting exercises to manage their CLBP and these people suggested the use of mass media to create more awareness about exercise (section 8.4.8). Consequently, behavioural journalism, a social cognitive theory related method (249), is included in response to recommendations for using mass media to inform the community about the legitimacy of exercises for managing CLBP. This is expected to reduce the resistance participants may face from the community in response to the long term adoption of exercises for managing their CLBP.
### Table 8.6: Refined ‘ukwu oma’ programme

<table>
<thead>
<tr>
<th>Intervention phases/ materials</th>
<th>Theory-based behaviour change methods (SRM and SCT)</th>
<th>Delivery informed by</th>
<th>Intervention components: BCTs and procedures</th>
<th>Intervention format</th>
<th>Intervention provider</th>
<th>Duration of intervention</th>
<th>Frequency of intervention</th>
<th>Context within which intervention was delivered</th>
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<tbody>
<tr>
<td>Education/ Patient and Physiotherapist booklets</td>
<td>MI</td>
<td>MI</td>
<td>Shape knowledge, Emphasize health consequences, Instruction on how to perform a behaviour</td>
<td>Self-assessment of affective consequences, Self-assessment of functional consequences*</td>
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<tr>
<td>Mapping of existing illness perceptions/ Physiotherapist booklet</td>
<td>Improving physical and emotional states</td>
<td>CBT</td>
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<tr>
<td>Challenging maladaptive illness perceptions/ Physiotherapist booklet</td>
<td>Improving physical and emotional states</td>
<td>CBT</td>
<td>Regulate negative emotions Regulate negative functional consequences*</td>
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<td>Intervention components: BCTs and procedures</td>
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<tr>
<td><strong>Formulation of alternative illness perceptions and associated behaviours/ Patient and Physiotherapist booklets</strong></td>
<td>Improving physical and emotional states</td>
<td>CBT</td>
<td>Regulate negative emotions, Verbal persuasion to boost self-efficacy, Regulate negative functional consequences*</td>
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<tr>
<td><strong>Practising the alternative (desired) behaviour (exercises and correct posture in a supervised session/ Patient and Physiotherapist booklets</strong></td>
<td>Guided practice, Goal setting</td>
<td>MI</td>
<td>Instruction on how to perform a behaviour, Verbal persuasion to boost self-efficacy, Behavioural rehearsal/practice, Habit formation</td>
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<tr>
<td><strong>Testing of alternative illness perceptions and associated behaviours/ Patient booklet (Videos of exercises/correct posture)</strong></td>
<td>(Behavioural journalism) Guided practice, Self-monitoring of behaviour, Set graded tasks, Planning coping responses</td>
<td>CBT</td>
<td>Provide social support Restructure the social environment, Restructure the physical environment Self-monitor behaviour Self-monitor outcome of behaviour, Habit formation</td>
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SRM= Leventhal’s self-regulatory model of illness cognitions; SCT= Bandura’s Social Cognitive Theory; MI= Motivational interviewing; CBT= Cognitive behavioural therapy; *= absent in the 93 BCTs
8.6.2 Theoretical underpinning of refined ‘ukwu oma’ programme

The refined ‘ukwu oma’ programme is underpinned by the self-regulatory model (SRM) of illness cognitions (179-181) and social cognitive theory (SCT) (305, 306). The SRM proposes that symptoms generate both cognitive and emotional representations that influence coping behaviours. Coping then affects health outcomes, which are appraised to determine whether to continue with the behaviours (Chapter 1, sections 1.8.1 and 1.8.2). The theoretical modification of the ‘ukwu oma’ programme was the addition of the SCT, informed by the results of this study.

The SCT explains that learning is affected by cognitive, behavioural, and environmental factors in a reciprocal relationship (306, 818). The SCT specifies five core sets of determinants of health behaviour: knowledge, perceived self-efficacy, outcome expectations, goals and perceived facilitators/environmental impediments (818).

Knowledge is the starting point and a precondition for behaviour change and was acknowledged in developing the ‘ukwu oma’ programme (Chapter 7 sections 7.3.2 and 7.3.4). People will only want to change their behaviour if they have a knowledge about how their lifestyle affects their health. However, knowledge is insufficient for behaviour change, and personal beliefs about the ability to enact the behaviour (perceived self-efficacy) are required to overcome barriers associated with changing and maintaining behaviour (818). Whether an individual adopts a healthy behaviour is also determined by the outcomes they expect from the behaviour (outcome expectations). Outcome expectations include physical outcomes, including losses and benefits, social outcomes such as the approval or disapproval the behaviour brings about in relationships to others, and personal outcomes which concerns the positive or negative self-evaluative reactions to the health behaviour and associated health outcomes. Goals include personal aspirations that people value highly. Short term goals help people to change behaviour by guiding their actions in the here and now, and are more influential than long term goals which may be associated with competing interests. Perceived facilitators and barriers, which include personal and environmental factors, also determine health behaviour. Individuals are more likely to adopt a health behaviour when they perceive fewer personal and societal impediments to that behaviour (818).
Of the five core determinants of behaviour in the SCT, perceived self-efficacy is the most fundamental as it affects health behaviour both directly and indirectly through its effects on the other determinants. People with stronger perceived self-efficacy, set higher goals and are more committed to achieving them, expect more favourable outcomes, view barriers as surmountable by the improvement of self-management skills, and are more likely to persevere in the presence of obstacles (306, 318, 818). Self-efficacy was acknowledged in the development of the ‘ukwu oma’ programme by targeting people’s beliefs in their ability to formulate adaptive illness cognitions about CLBP, and practice exercises and better posture for managing it (Chapter 7, sections 7.3.2 and 7.3.4). Not knowing how to do the exercises had some influence on exercise adoption (Section 8.4.6), highlighting the importance of self-efficacy.

Communities’ beliefs and attitudes towards exercising and adopting better posture for managing CLBP, labelled as social outcomes (outcome expectations) in the SCT (818), were not targeted by the ‘ukwu oma’ programme. This is now included as this was suggested by participants to be a salient factor that may influence exercise adoption and maintenance in rural Nigeria (Chapter 8, section 8.4.8). The illustration in Figure 8.4 below summarises the theoretical underpinning of the refined programme.

**Figure 8.4**: Theoretical underpinning of refined ‘ukwu oma’ programme involving the Leventhal’s self-regulatory model of illness cognitions and aspects of the social cognitive theory
8.7 Conclusions

This is the first study that tested a complex theoretically informed biopsychosocial intervention aimed at reducing CLBP disability in any rural African context. Findings suggest that this intervention is feasible and acceptable in rural Nigeria. SRM and SCT are theories that may prove useful in explaining CLBP-related health behaviour in rural Nigeria.
9 General discussion

9.1 Chapter summary

This chapter presents the discussion of the results from the studies in this thesis. It starts with the objectives of the thesis (section 9.2), followed by the overview of the results of individual studies (section 9.3), which is then compared with findings in western settings (section 9.4). The researcher’s personal reflections on the PhD research process (section 9.5), and the strengths and limitations of this thesis are explored next (section 9.6), followed by the theoretical implications of the research (section 9.7). The implications of the findings of this thesis for future research (section 9.8), physiotherapy practice and training (section 9.9), and public health practice (section 9.10) in Nigeria, are then discussed. Finally, the conclusions of the thesis are presented (section 9.11).

9.2 Objectives of the thesis

Study 1: Explore the experiences of people living with CLBP in rural Nigeria.

Study 2: Explore the management of CLBP in rural Nigeria.

Study 3: Cross-culturally adapt and psychometrically test the measures for assessing the biopsychosocial factors implicated in the experience of CLBP in rural Nigeria.

Study 4: Investigate the biopsychosocial factors associated with CLBP disability in rural Nigeria.

Study 5: Systematically review the available literature and assess the intervention components most likely to improve the acceptability of exercises, and physical activity behaviour in people with chronic non-communicable diseases in Africa.
Study 6: Develop an exercise-based SMP to target the biopsychosocial factors associated with CLBP disability in rural Nigeria and promote exercise-related behaviour change; then assess the programme’s feasibility in rural Nigeria; and produce a refined SMP for use in rural Nigeria.

9.3 Overview of the results

Study 1

Qualitative interviews exploring the experiences of 30 people living with CLBP in rural Nigeria suggested that complex biopsychosocial factors influenced the impact of CLBP (Chapter 2). There is very limited research in this area with which to compare these findings but the psychosocial factors described included beliefs about CLBP being a disease of hard labour and deprivation, similarly reported in rural Botswana (229). Spiritual causal beliefs about CLBP originating from evil forces, were however different from the views of CLBP being a test or punishment from God, that have been reported in South Africa (410). Severe psychological distress (expressed mainly through bodily symptoms such as ‘tiredness’), due to the real and perceived impact of CLBP; maladaptive coping strategies such as drug dependence, cure seeking and overworking; and dissatisfaction with health care were also found.

Biomechanical factors were implicated in the reports of CLBP being aggravated by jobs involving heavy lifting and bending, similar to findings in rural Botswana (229), although this perception could also be related to fear avoidance beliefs (68, 148, 173, 174, 176, 462).
Study 2

Qualitative interviews with Practitioners’ and Pastors’ consulted by participants in Study one revealed beliefs such as linking CLBP to degeneration and infection, heavy lifting and bending, and spiritual factors. These led to unhelpful management practices such as recommending bedrest and focusing on diagnosing CLBP, unimodal biomechanical treatments such as manipulation, exercise therapy and traction, and spiritual healing attempts (Chapter 3). These may reinforce the maladaptive beliefs and coping strategies, and unrealistic treatment expectations of people with CLBP. This may have resulted in participants’ loss from mainstream health care, and dissatisfaction with health care overall. The Practitioners’ reports of people with CLBP describing ‘things moving about the body’, suggests that somatisation may be used to express psychological distress in rural Nigeria, as has been found in other non-western settings (124, 125). Although there is little literature to compare with these findings, they do support the biopsychosocial model of CLBP (43, 203, 204).

Study 3

The cross-cultural adaptation of self-report western-developed measures into Igbo and psychometric testing of the Igbo measures suggested good comprehensibility, acceptability, validity and reliability in Igbo speaking culture (Chapter 4). It was not possible to determine whether there were any differences between self-report and interviewer-administration due to the low literacy rates in rural Nigeria.

However, the difficulty in the cross-cultural adaptation of the Igbo-HADS suggests that the concept of anxiety, depression or emotional distress may be unclear in rural Nigeria or expressed differently in this context. One such example, may be the expression of emotional distress through somatisation, also suggested in Studies one and two. Similarly, psychometric testing of the Igbo-CSQ showed factor structures that differed from the original measure for all subscales except catastrophising. This suggests that pain coping strategies may be different in this population, as catastrophising is often not
regarded as a coping strategy (158, 178, 184, 193). Moreover, none of the coping strategies were associated with positive outcomes in this population.

**Study 4**

The results of this cross-sectional study involving 200 participants with CLBP suggested that participation, mobility, and life activities were the most important CLBP disability domains. CLBP disability in rural Nigeria is not impairment focused, in agreement with the literature (1, 2, 819).

Psychosocial factors, particularly illness perceptions and fear avoidance beliefs, may be the most important factors associated with CLBP disability in rural Nigeria, as they predicted both self-reported and performance-based disability (Chapter 5). Pain intensity, catastrophising and anxiety were also associated with self-reported disability. These findings concur with the literature in western developed countries (68, 69, 79, 111, 138, 147, 153, 820), but there is no literature in other rural African contexts with which to compare results.

However, the comparatively weaker relationship between anxiety, depression, and CLBP disability could be due to the unclear concept of these emotions, different ways of expressing them in rural Nigeria, as suggested in Studies one, two and three, or the fact that emotional representations contributed to the total score of illness perceptions. Anxiety had stronger associations with CLBP disability than depression, which could be related to the fact that the anxiety subscale of the Igbo-HADS had more items corresponding to the original subscale than the depression subscale, or that somatisation may be more related to anxiety than depression (619). However, somatic symptoms are excluded from the HADS, the measure used to assess anxiety and depression in this thesis, so it is difficult to draw conclusions.

Biomechanical factors were not associated with CLBP disability in rural Nigeria, concurring with reports in western developed countries (68, 223). This result was in contrast to: participants’ reports that heavy occupational activities such as heavy lifting and prolonged trunk flexion aggravated their back pain and affected work-related
activities (Study 1); the predominant biomechanical model of managing CLBP in rural Nigeria (Study 2); and some evidence (Literature review – Chapter 1) linking occupational biomechanical exposure (lifting, bending, twisting, digging or shovelling) to inability to return to work or perform normal duties, sustained remission from persistent pain, compensation claiming and transition to chronicity (65, 213-215). However, the disability measures used in the regression analyses in this study did not assess work-related disability, an important component of the ICF model of disability (42), or the other disability related constructs including compensation claiming and pain persistence.

Additionally, the “healthy worker” effect where healthy workers are more likely to remain in a manual job whereas less healthy workers may change or leave their jobs due to CLBP (96), was suggested in rural Nigeria in Study one, in which a few participants reported that they stopped working or changed their jobs due to CLBP. Therefore, a cross-sectional study design may not uncover true associations between any biomechanical factors and CLBP work related disability in rural Nigeria as people who may have left or changed their jobs due to CLBP may not be reflected in the results. A systematic review that found associations between work-related CLBP disability and biomechanical factors (‘heavy work’) included only longitudinal studies that followed people as they developed CLBP. This review was able to identify that people doing heavier jobs were more likely to leave or change their jobs due to persistent LBP (141). Longitudinal study designs may therefore eliminate the ‘healthy worker effect’ and clarify the true relationships between biomechanical factors and CLBP work-related disability in rural Nigeria.

However, psychosocial factors appear more important than biomechanical factors in CLBP disability in rural Nigeria as it appears to influence most participants. In contrast, only a few participants reported stopping or changing their manually demanding jobs due to CLBP (Study 1). Evidence from longitudinal studies that measured both functional and work-related CLBP disability suggests that psychosocial factors predict both functional and work-related CLBP disability, whereas biomechanical factors may only be associated with work-related CLBP disability (65, 110, 213, 214). Moreover, return to work status and compensation claiming, often associated with occupational biomechanical factors, are constructs that appear to be reflected in self-reported
disability (52, 53, 496, 609) and fear avoidance beliefs (149) respectively. This makes it unclear whether biomechanical factors are associated with disability, fear avoidance beliefs or both. This potential association is supported by the finding in this study that the males had higher scores in terms of biomechanical exposure, and also had higher fear avoidance beliefs.

**Study 5**

A systematic review was conducted in order to uncover the contextual factors that may influence physical activity-related behaviour change (including exercise), in line with recommendations (249). Limited evidence suggested that interventions containing BCTs: behavioural rehearsal/practice, habit formation, restructuring the physical and social environment, and providing information about health consequences may facilitate acceptability of physical activity, and physical activity behaviour change in Africa. Health professionals trained in behaviour change techniques, health facilities adapted for chronic disease management, ongoing interventions with possibility of repeat sessions for patients, combined group/individual programme sessions, and BCTs: shaping knowledge, instruction on how to perform a behaviour, regulating negative emotions, providing social support, may further improve acceptability of physical activity related interventions in this context. Lack of good quality evidence means results need to be treated with caution but nevertheless these intervention components may inform intervention development in Africa, although they require more rigorous investigations.

**Study 6**

This study described the development and feasibility testing of a SMP to promote exercise-related behaviour change. Acknowledging the biopsychosocial factors associated with CLBP disability in rural Nigeria (Studies 1 to 4; Literature review – Chapter 1), and the intervention components that may improve the acceptability of
exercise-related behaviour (Study 5), facilitated the development of the ‘ukwu oma’ programme (Chapter 7). The programme incorporated techniques from CBT, MI, and exercise therapy (including postural training), in line with self-management guidelines for CLBP (9, 298).

The programme appeared feasible and acceptable in rural Nigeria (Chapter 8). Feasibility was demonstrated in terms of excellent recruitment (100%), very good programme attendance (83%), very good exercise adherence (EARS: 15.9 to 20.6), and very low dropout rates in the self-management (8%) and control (11%) groups. Reductions in self-reported and performance-based disability: Igbo-RMDQ (-9.8) and BPS (-0.8), illness perceptions (-21.6), fear avoidance beliefs (-41.7), pain intensity (-3.8), pain medication use (-14.6), systolic blood pressure (-12.5) and diastolic blood pressure (-5.8) were reported. This appears promising, however, the large effect sizes in the self-reported biopsychosocial outcomes must be interpreted within the context of the possibility of large measurement errors for these self-reported outcomes in rural Nigeria (Study 3). Additional bias may have been introduced by the interviewer-administration of the self-report measures being conducted by the researcher, who also developed and administered the programme.

The acceptability of the programme was suggested by qualitative individual exit feedback interviews (Chapter 8). However, the participants’ reports may have been subject to self-presentation bias, as the researcher who delivered the intervention, also conducted the interviews. Exercise-related behaviour change appeared to be most influenced by improvement in symptoms, which may have been actual or perceived (Chapter 8), in contrast to findings in the systematic review (Chapter 6). This is not surprising as no study of chronic pain could be included in the review, suggesting that this finding may be specific to chronic pain conditions. Changes in pain intensity may be more apparent in chronic pain conditions than in other chronic conditions such as hypertension and diabetes, where no symptoms are often detectable. Therefore, it is possible that reduction in symptoms may be more influential in facilitating behaviour change in chronic pain conditions than other chronic conditions.

However, some findings from the systematic review (Study 5) were replicated in the feasibility study (Study 6). Social support via group sessions, shaping knowledge via collaborative learning, employment of a health professional skilled in behaviour change
techniques, use of self-help educational materials, acknowledgement of the social environment (such as not doing exercises on Sundays due to church activities), restructuring the physical and social environment via community involvement through education, ongoing programme sessions, and using a primary health care facility adapted for chronic pain management, were either reported to improve outcomes or suggested to improve the programme (Study 6).

The negative view of the community about exercises as legitimate treatment for CLBP (Studies 1 and 6), and the practitioners’ CLBP beliefs and unhelpful management practices (Study 2) may hamper the uptake of long-term exercise-related behaviour change in rural Nigeria. This suggests that the social context may be an important consideration for SMPs in rural Nigeria. It is therefore not surprising that participants recommended that people in the community were made aware of the utility of exercises for managing CLBP. To reflect this discovery, the programme was subsequently modified by including an additional theory – SCT (305, 306, 821, 822), through the use of behavioural journalism to inform the rural communities about exercise and legitimise its use for managing CLBP in rural Nigeria. This potentially restructures the social environment to support long term exercise-related behaviour in rural Nigeria. Restructuring the social environment may support long term exercise-related behaviour change in Africa (Study 5).

The refined ‘ukwu oma’ programme is in line with the WHO’s CBR model (370, 371) because not only is it community-based, but it also acknowledges that the beliefs and attitudes of the community to CLBP may influence the impact of CLBP (819, 823-825). Therefore, the CBR model may be useful in the future testing of the ‘ukwu oma’ programme in rural Nigeria, which will be the first of its kind in Africa.

9.4 Comparison of key findings with results in western populations

Contrary to western developed countries where the biopsychosocial model has become established as the best management strategy for CLBP (201, 284, 481, 826), the clinical management of CLBP is still predominantly biomedical in Nigeria.
This thesis has shown that psychosocial factors, especially illness perceptions and fear avoidance beliefs, may be the most important factors associated with CLBP disability in rural Nigeria. Despite completely different socio-economic environments, these results echo the findings among populations in western developed countries including the UK, Netherlands and the US (69, 138, 147, 150, 164, 173). However, the specific content of illness perceptions may differ between contexts. Comparable to findings in western developed countries (20, 152, 154-156), pain intensity and catastrophising were associated with self-reported disability among people with CLBP in rural Nigeria.

Although, anxiety and depression were associated with self-reported CLBP disability in rural Nigeria, they did not appear to have as much influence on CLBP disability as has been reported in western developed countries (20, 79, 138, 139). This may be because the concept of emotional distress may be unclear or expressed differently in rural Nigeria compared to western developed countries, or that illness perceptions, which included emotional representations are more important in this context.

In contrast to a few western based studies where coping strategies, such as coping self-statements, were associated with lower pain and disability (184, 197), no coping strategy was associated with lower CLBP disability in rural Nigeria. Most coping strategies reflected in the CSQ did not appear to be consistently used in rural Nigeria.

Occupational biomechanical factors may not be important in functional CLBP disability in rural Nigeria, analogous to results in western populations (65, 110, 215). However, job-related biomechanical factors may exert some influence on work-related CLBP disability in rural Nigeria, as suggested by a few participants’ interview reports, in a similar way to that reported in western populations (65, 141, 213).

The feasibility of a biopsychosocial SMP containing all core components of self-management: knowledge of the condition and management options, management of impact on physical and psychosocial functioning, patient-provider shared responsibility for a plan of care, self-efficacy building, self-tailoring, self-monitoring, goal-setting and action planning, decision-making, problem solving, and confidence in the use of support services (286, 296) was demonstrated. This mirrors the evidence in western developed countries showing that self-management can improve pain intensity, CLBP disability (295, 296), and psychosocial outcomes (206, 207).
In contrast to SMPs in developed countries that are often health facility based with patients attending programmes via health system referral (341-344, 349, 350), SMPs may need to be community-based and enable rural dwellers in Nigeria, who lack access to health care, to attend programmes through self-referral. In contrast to western developed countries where self-regulation like self-monitoring may have the most important influence on exercise-related behaviour change (721), SMPs in rural Nigeria may also need to pay more attention to modifying the social and physical environment. These differences could be related to the fact that patients in developed countries are more likely to have better access to health care and information, and live in more standardised social and physical environments than in rural Nigeria. Whereas online based SMPs have been used in western developed countries to increase accessibility and cost-effectiveness (340), they may not be feasible in rural Nigeria with low literacy rates and poor access to internet services.

9.5 Personal reflections on the PhD research process

I began this PhD with the salient biomechanical model of CLBP common in Nigeria, which has now changed to a biopsychosocial model of CLBP based on the overwhelming research evidence from the studies in this thesis and previous research. The SMP developed in this thesis is the first biopsychosocial intervention aimed at reducing CLBP disability in any rural African context. Prior to this thesis, there was limited evidence of the biopsychosocial factors associated with CLBP disability and exercise behaviour change in rural African contexts. Therefore, I had to conduct many studies to ensure that the intervention being developed was evidence-based and culturally appropriate, and that I was not simply imposing a western intervention in a non-western setting. The many studies in this thesis made it possible to highlight the salient context-specific factors that may not have been discovered if only a few studies were conducted. However, the large number of studies may have reduced the time for adequate planning for data collection, and may explain some of the limitations in the individual studies.
9.6 Strengths and limitations

The overall strength of this thesis is its novelty. This is the first comprehensive study of people living with CLBP in rural Nigeria, and the most comprehensive study of people living with CLBP in any rural African context. The thesis began with qualitative research, in line with MRC guidance and other recommendations in a field with few existing studies (377, 405, 406, 827, 828). The rigorous systematic data collection and analysis, detailed description of the methods and the orientation of the researcher, reflexivity and respondent validation, as well as substantiation of findings by a multidisciplinary team strengthened the two qualitative studies (Studies 1 and 2). Generalisability is not the focus of qualitative enquiry, however, many findings in the qualitative studies were reported in other African and western developed countries, including rural Botswana (229), urban South Africa (410), the UK and USA (379, 380, 395, 408, 436).

The focus of subsequent investigations on the most relevant biopsychosocial factors in this context was informed by the results of the qualitative studies, as recommended by other researchers (829, 830). These informed the choice of measures (Study 3), and may explain the stronger predictive power of the regression models that predicted CLBP disability in rural Nigeria (Study 4) compared with some cross-sectional studies in western developed countries (166, 656). However, the high measurement errors of the adapted measures, probably explained by low literacy and a culture different from the western countries in which these measures were developed, is a potential weakness that may have influenced the findings of this thesis. Additionally, bilingual testing of the adapted measures could not be carried out because only a few people were literate and bilingual in English and Igbo. However, these limitations may have been mitigated by the rigorous cross-cultural adaptation of measures (Study 3), and the integration of qualitative research which did not utilise the adapted measures. The qualitative studies allowed individuals to express themselves in their own terms, and may have strengthened the quantitative findings through triangulation of results (422, 831-834).

The simultaneous investigation of the association of psychosocial and biomechanical factors with both self-reported and performance based disability, and the use of rigorous sampling, data collection methods and statistical analyses strengthened the cross-sectional survey (Study 4). However, the cross-sectional design of the study
precludes the distinction between causes and consequences of CLBP disability, and may not have uncovered all the biopsychosocial factors associated with CLBP disability in rural Nigeria. The possible measurement burden to participants due to the large number of variables assessed may also have influenced outcomes. Future research may therefore employ longitudinal designs to clarify the causes and consequences of CLBP disability, and use patient involvement to determine the optimum number and type of measures utilised in rural Nigeria.

The systematic review (Study 5) integrated the results of a few low quality quantitative studies with qualitative interviews which enabled a somewhat limited understanding of the factors that might improve the acceptability of physical activity behaviour change in Africa. However, the inclusion of only a few studies, and the fact that they contained some methodological limitations has reduced confidence in any findings, so these results must be treated with caution. Nevertheless, it was possible to identify some elements such as behavioural rehearsal/practice, habit formation, and restructuring the physical/social environment, associated with physical activity behaviour in the systematic review, that were also suggested in the feasibility study (Study 6), and several other systematic reviews (835-840). It is hoped that the review findings will help to inform future research and clinical practice in Africa.

The ‘ukwu oma’ programme was developed (Chapter 7) based on the MRC guidance for developing and evaluating complex interventions (377), the IM approach for developing and evaluating behaviour change interventions (249, 764-767), evidence-based theories, behaviour change methods and techniques (179, 181, 249, 305, 306, 318, 356, 818), and targeted the biopsychosocial factors associated with CLBP disability in rural Nigeria. However, the intervention is very complex, and the feasibility of it being delivered by practitioners in rural Nigeria who have less training than the researcher is yet to be established. Future research will need to establish the training needs of such practitioners, and the best way to ensure adequate training and intervention fidelity.

The feasibility study (Study 6) was conducted following recommendations of the conceptual framework for defining feasibility and pilot studies in preparation for RCTs (797). Although recruitment rate was excellent overall, it was challenging recruiting younger and male participants. This difficulty was also found in the cross-sectional survey (Study 4), and was ameliorated by recruitment from work sites. This may be
useful in future RCTs involving this population in rural Nigeria. Convenient sampling and assignment, non-randomisation, lack of assessor blinding, short follow-up period, contamination of treatment groups, and interviewer-administration of measures by the researcher who developed and delivered the programme are other limitations that may have exaggerated positive outcomes. Random sampling, cluster randomisation, involvement of blinded assessors, and long follow up periods may reduce bias in a future testing of the programme in rural Nigeria. Intervention fidelity could not be investigated, as recommended by guidelines (788), because no other person in the research team could understand Igbo. This suggests that in future studies, people competent in Igbo, who are not involved in delivering the intervention may need to be involved to assess intervention fidelity. However, fidelity was not the focus of the feasibility study.

9.7 Theoretical implications of the research

Theory-based interventions explain why interventions are effective or ineffective by furnishing key constructs hypothesized to drive behaviour (312). The studies in this thesis were predicated on two theories (chapter 8, section 8.6.2) which underpin the ‘ukwu oma’ programme: the self-regulatory model (SRM) of illness cognitions (179-181) and the social cognitive theory (SCT) (305, 306, 821, 822).

The SRM may help to clarify how problematic cognitive and emotional representations of CLBP can lead to maladaptive coping strategies, which may increase CLBP disability, and if modification of these maladaptive representations can reduce CLBP disability in rural Nigeria. The SCT may help to elucidate how long-term exercise-related behaviours may be influenced by social environmental factors particularly communities’ beliefs and attitudes toward exercises for managing CLBP, and how modification of these beliefs and attitudes may facilitate long-term exercise-related behaviour change, which may reduce CLBP disability in rural Nigeria.

Evidence suggests that interventions based on a single theory are more effective in influencing physical activity behaviour change (312). Interventions based on more than one theory are often heterogeneous and do not provide the rationale for theory integration which may reduce efficacy (312). These problems are addressed in the ‘ukwu
oma’ programme as exercise behaviour is mainly targeted by SCT whereas adjustment to maladaptive coping strategies is predominantly targeted by the SRM. Moreover, the rationale for integrating the two theories was clearly explained. Nevertheless, it is possible that using one theory alone might make the programme simpler for other health professionals to grasp. Therefore, further testing of the intervention is necessary before firm conclusions can be drawn.

The SRM based methods include motivational interviewing, improving physical and emotional states, goal setting, self-monitoring of behaviour, setting graded tasks and planning coping responses (249). The SCT based methods adopted include behavioural journalism (249, 841-844) to influence social outcome expectations, and guided practice and setting graded tasks to affect perceived self-efficacy.

However, some theory-based methods belong to both SRM and SCT such as guided practice and setting graded tasks (249). Theoretical overlap is common and found in the presentation of a construct in several theories such as self-efficacy in SCT, TPB and TTM (312). Behavioural journalism via community-wide exercise campaigns with real life role model stories of people for whom exercise-related behaviour improved their CLBP, is a social environmental modification that may support exercise-related behaviour change for people with CLBP in rural Nigeria, reflecting the WHO’s CBR model (370, 371).

The psychological aspects of the programme are based on cognitive behavioural therapy (CBT) (845-847) and motivational interviewing (MI) (783) approaches. CBT can help people explore how their beliefs, thoughts and emotions reinforce and maintain their maladaptive behaviour, increasing the adverse impact of CLBP. MI is used to encourage participants to identify personal beliefs, thoughts and emotions, as well as physical and social environmental factors, that would help them perform and maintain exercise-related behaviour. Hence, both approaches can inform an exercise based self-management intervention and thereby increase its impact.

The physical approaches in the programme are exposure based, meaning actual performance of exercises incorporating postural training during the programme sessions. Exercises included aerobic, resistance, neuromuscular, stretching, and relaxation exercises (263, 265, 848, 849). Postural training involves instructions and
demonstration of correct posture during culturally relevant functional activities identified from the Nigeria back school (73).

9.8 Implications for future research

9.8.1 Further testing of adapted Igbo measures

The Igbo measures need further testing to confirm their psychometric properties. Populations of varied literacy levels adopting interviewer- and self-administration could be studied to determine if these influenced measurement errors. Bilingual testing which compares the level of agreement between the original and adapted measures needs to be carried out in a literate Nigerian population. More rigorous analysis, such as receiver operating characteristic (ROC) curves, including patients’ own global impression of change (645), may be needed to determine the MCIDs of the measures. Finally, larger studies need to confirm the factor structures of the Igbo-WHODAS, Igbo-HADS, Igbo-CSQ, Igbo-MSPSS and Igbo-FABQ.

9.8.2 Prospective studies to establish the biopsychosocial predictors of CLBP disability in rural Nigeria

Future studies need to clarify any contribution of occupational biomechanical factors (relative to psychosocial factors) to functional and work-related CLBP disability in rural Nigeria. These studies need to control for the effects of psychosocial factors and isolate the influence of fear avoidance beliefs and occupational biomechanical exposure. This could be done by using prospective study designs (before people develop CLBP) to rule out the “healthy worker effect”, although a difficulty of this approach would be the large sample size required. These studies need to include measures of occupational biomechanical exposure, fear avoidance beliefs and the other psychosocial factors found to be associated with CLBP disability in rural Nigeria, as well as work-related and functional CLBP disability measures.
Furthermore, alternative ways of measuring emotional distress may need to be adopted in rural Nigeria such as using measures of somatisation (850-853), measures that integrate somatisation with anxiety and depression (854, 855), or using ‘idiographic’ patient generated psychological outcomes such as PSYCHLOPS (Psychological Outcome Profiles) (856). PSYCHLOPS seeks the patient’s perspective on their psychological distress through the patient’s own description and subsequent scoring of their most important problems (856). It has demonstrated validity, reliability and sensitivity in measuring psychological distress (857, 858), and has better psychometric properties than the HADS (859). It is thus appropriate for use in different cultural contexts, and has recently been employed in Africa by WHO researchers.

Similarly, new pain coping strategies measures may need to be developed to reflect how people coped with LBP in rural Nigeria. Patient generated outcomes may also prove useful in measuring coping strategies in rural Nigeria by allowing participants to list all the ways they managed their CLBP which can then be analysed categorically.

### 9.8.3 Update the systematic review to determine the behaviour change intervention components for improving physical activity in Africa

The systematic review needs to be updated as more clinical studies of physical activity related interventions for chronic conditions become available in Africa. As there was no identified study of chronic pain in the systematic review, the feasibility study of the ‘ukwu oma’ programme provides some quantitative and qualitative data that can add to the results of the systematic review.

### 9.8.4 Further testing of the ‘ukwu oma’ programme in rural Nigeria

A RCT is needed to determine the effects of the ‘ukwu oma’ programme, and clarify the mechanisms through which outcomes are produced.

The programme fidelity needs to be evaluated in any future RCT using recommended guidelines (788). Audio-visual recordings of programme sessions, obtained with
participants’ consent, is recommended for assessing intervention fidelity. A team of multidisciplinary evaluators including Psychologists and Physiotherapists, at least two of whom must be external to the trial and competent in the language in which the intervention would be delivered may need to be involved. Programme fidelity, investigated via assessments of health professional training and competence, adherence to intervention manual during delivery, intervention receipt and the extent to which participants apply the skills learnt, should be quantified based on a scoring system that needs to be developed (788).

Competence is the level of skill, such as the ability to respond to contextual cues, while adherence is the extent to which the essential content, delivery strategies and theories prescribed by intervention designers are delivered while avoiding proscribed activities (788). Adherence and competence need to be well balanced to ensure flexibility to varying contextual cues, including group dynamics and collaborative relationships, responsive tailoring of programme, and pacing of delivery, while adhering to the core principles of the ‘ukwu oma’ programme.

A pragmatic single blind cluster randomised controlled trial may need to be adopted. Due to the complex nature of the programme, it will be impossible to blind participants and intervention deliverers to the intervention received or delivered. However, statisticians and outcome assessors should be blinded to group allocation. Allocation concealment is assured because individuals are not the unit of treatment allocation, therefore individual treatment allocation cannot be tampered with. Random sequence generation may be assured via computer generated simple randomisation of the clusters of villages. Due to the community-based component of the programme (exercise multimedia campaigns), similar intervention clusters may be close together whereas intervention and control group clusters should be far apart to avoid contamination between groups. Additionally, cluster randomisation may prevent the problem of acceptability of group assignment because all groups in a cluster will receive the same intervention and will be unaware of other treatment groups. Individuals in each cluster could be stratified by gender (e.g. male or female), age (e.g. 18-29 or 30+) and occupation (e.g. manual or non-manual), such that all possible strata are included in each cluster. All strata may need to be equally represented in each group to promote group coherence. However, strategies to improve programme attendance in the male
and younger participants should be explored. Although cluster randomisation limits treatment contamination, the study design and analysis is more complex, and larger sample sizes than required in individually randomised controlled trials, are needed to take account of the extra variability within clusters (377).

The outcomes to be utilised in a RCT of the programme need to reflect the theoretical constructs of the programme (Chapter 8, section 8.6.2), to clarify the mechanisms through which outcomes are produced. For instance, outcomes could be broadly categorised into beliefs (individual and community) and emotions; coping strategies and health behaviours; and health impact (disability and pain).

Primary health impact outcomes may include functional and work-related CLBP disability, and pain intensity self-reported measures. This responds to calls made for multi-domain assessments that separate the concepts of pain, functional and work related CLBP disability which have different underlying factors (284).

Secondary belief and emotional outcomes may include illness perceptions, fear avoidance beliefs, catastrophising, psychological distress, pain self-efficacy, and the community’s beliefs and attitudes towards exercises for managing CLBP.

Secondary coping outcomes may include pain coping strategies, pain medication use, exercise adoption, and adoption of correct posture in daily functional activities. Pain medication use can simply be measured by asking individuals to state the number of pain tablets they had taken for their CLBP in the past two weeks. However, new measures may be needed for the other coping outcome measures. Currently, the EARS (800) is the only validated measure of exercise adherence, and may need to be cross-culturally adapted for rural Nigeria. Presently, no measure exists to assess the adoption of correct posture during functional activities (813), and so a measure may need to be developed for a future RCT in rural Nigeria. Similarly, a new measure may need to be developed to better reflect the pain coping strategies commonly adopted in rural Nigeria, as many subscales of the Igbo-CSQ may not be suitable for this population.

A cost-effectiveness analysis including personal cost analysis would also be advisable considering the significant burden of CLBP in rural Nigeria (1, 3, 24, 25, 28), and the high levels of poverty in this context (239-244).
9.9 Implications for physiotherapy practice and training in Nigeria

To the surprise of the researcher, psychosocial factors appear to be more important than biomechanical factors in CLBP in rural Nigeria. Consequently, there needs to be a paradigm shift in the clinical management of CLBP in rural Nigeria from a biomedical model to a biopsychosocial model that acknowledges the highlighted psychosocial factors. To achieve this, the current biomedically focused physiotherapy curriculum in Nigeria needs to be evidence-based using the biopsychosocial model to prepare future physiotherapists. Countries in western developed countries, such as the UK, adopt a biopsychosocial model during physiotherapy training, which may be a useful approach to follow in Nigeria.

Practising physiotherapists and undergraduates in Nigeria will need to be trained in biopsychosocial approaches to assessment and interpretation of patients’ various clinical conditions. For instance, how clinical interviewing or subjective assessment may need to be modified to identify psychosocial factors, how subjective findings can be interpreted, and how psychosocial factors can be clinically targeted. Advocacy campaigns involving the Nigeria Society of Physiotherapy may be needed to enable simultaneous modification of physiotherapy training across Nigerian universities, and clinical practice across Nigerian health care facilities. However, as suggested in western developed countries, this is not a simple matter, and there may be resistance to adopting a new approach (361, 456). Considerable time and effort may therefore be required to modify physiotherapists’ beliefs, and translate training into practice in Nigeria.

9.10 Implications for public health in Nigeria

The ‘ukwu oma’ programme may have a public health impact in rural Nigeria if it is found to be effective, considering the significant CLBP burden in this context. To enable accessibility to all people that have CLBP and sustainability in rural Nigeria, the programme needs to be delivered in nearby village primary health care centres and
linked to community-based and community-controlled programmes, probably adopting the WHO’s CBR model (370, 371).

An important consideration is who should deliver the programme. For this thesis, the programme was physiotherapist-led. However, Nigerian physiotherapists routinely practise in secondary, tertiary and private urban-based hospitals. A policy change that enables Nigerian physiotherapists to work in rural primary health care centres could potentially enable this programme to be physiotherapist-led. However, implementation of this type of programme may not be feasible in the near future. Alternatively, CHWs who are already available in rural Nigeria as front line primary health care workers, might be trained to deliver the intervention. This would enable an immediate implementation of the programme thereby reducing CLBP burden in rural Nigeria. Additionally, it may be easier to train CHWs as they do not appear to have established unhelpful beliefs about CLBP and are currently not consulted for CLBP in rural Nigeria. In contrast, physiotherapists may have entrenched biomechanical beliefs about CLBP that may be more difficult to challenge. Establishing the effectiveness of the programme delivered by CHWs in rural Nigeria may consequently convince Nigerian physiotherapists to change their practice. Nevertheless, although CHWs have been able to deliver similar programmes in countries including the USA and South Africa (375, 860-862), it is unclear whether the CHWs in rural Nigeria can be trained to successfully deliver such a complex programme.

9.11 Conclusions of the thesis

This PhD thesis contains six studies carried out over three years. The conclusions of this work are summarised below.

Beliefs and emotions associated with CLBP induce coping strategies that may influence the impact of CLBP in rural Nigeria.

Beliefs and management strategies of mainstream and alternative practitioners strongly influence the beliefs, emotions and coping strategies of people with CLBP, and consequently the impact of CLBP in rural Nigeria.
Psychosocial factors, particularly illness perceptions and fear avoidance beliefs are associated with CLBP disability, and are more important predictors of CLBP disability than biomechanical factors in rural Nigeria.

There is limited evidence that the BCTs: behavioural rehearsal/practice, habit formation, and restructuring the physical and social environment may contribute to acceptability of physical activity, and physical activity behaviour change in people with chronic NCDs in Africa.

The ‘ukwu oma’ (good back) programme as delivered in this thesis was feasible, and acceptable. It appears promising for improving exercise-related behaviour and biopsychosocial outcomes in rural Nigeria.
Publications and research awards

Published articles


Published abstracts


Conference presentations


**Research awards**

- Schlumberger faculty for the future fellowship award, March, 2015.
References


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of disability of patients with chronic low back pain: a randomized controlled trial. *Archives of physical medicine and rehabilitation* 79(5), 475-487.


Appendices

APPENDIX 1: REFLECTIVE DIARY (PATIENTS)

Reflective diary 10/9/2013
Ethical consideration forced me to introduce myself to the participants and I think who they perceive me to be may be affecting their responses. The participants with CLBP are focused on the ‘white men’ coming to their rescue while disregarding the Nigerian ‘doctors’ comparing them unfavourably with the ‘whites’. They are focused on foreign drugs that will cure their pain.

Reflective diary 14/9/2013
It seems that most participants watched videos in their homes and from the discussions with them they seem to be influenced a lot by what they watch on television. I think I may consider CDs as one of the formats for my self-management package.

Reflective diary 22/9/2013
I have been wondering why some participants with CLBP kept referring to being ‘tired’. My interview today with some pastors with CLBP who spoke mostly in English showed that the Igbo word ‘tired’ may have been used by participants to imply that they were depressed. He said he was depressed in English and then I asked him to explain that in Igbo and he used the Igbo word for ‘tired’ to explain depression.
APPENDIX 2: ETHICAL APPROVALS FOR QUALITATIVE STUDIES

Research Ethics Office

Chinonso Anya-Ebi
Room 3.11 Department of Physiotherapy
School of Medicine
3rd Floor Shepherds House
King’s College London
Guy’s Campus
London SE1 1UL

07 August 2013

Dear Chinonso,

BDM12/13-123 Barriers and Facilitators to Self-Management for Chronic Non-Specific Low Back Pain in a Rural Nigerian Community

Review Outcome: Full Approval

Thank you for sending in the amendments/clarifications requested to the above project. I am pleased to inform you that these meet the requirements of the BDM RESC and therefore that full approval is now granted with the following provisos:

1. All Consent Forms: State the date up to which participants can withdraw their data i.e. 30 September 2014.

Note that you do not need to submit a response to the above proviso, however; it is a condition of the approval granted by the BDM RESC that the proviso is carried out prior to the study commencing. If the proviso is not adhered to, the approval granted by the BDM RESC would no longer be valid. Should you have any queries on this please do not hesitate to contact the Research Ethics Office.

Please ensure that you follow all relevant guidance as laid out in the King’s College London Guidelines on Good Practice in Academic Research (http://www.kcl.ac.uk/college/policyzone/index.php?id=247)

For your information ethical approval is granted until 07 August 2016. If you need approval beyond this point you will need to apply for an extension to approval at least two weeks prior to this expiry date. If the extension is needed, please note however that a full re-application will not be necessary unless the protocol has changed. You should also note that if your approval is for one year you will not be sent a reminder when it is due to lapse.

Ethical approval is required to cover the duration of the research study, up to the conclusion of the research. The conclusion of the research is defined as the final date or event detailed in the study description section of your approved application form (usually the end of data collection when all work with human participants will have been completed), not the completion of data analysis or publication of the results. For projects that only involve the further analysis of pre-existing data approval must cover any period during which the researcher will be accessing or evaluating individual sensitive and/or anonymised records. Note that after the point at which ethical approval for your study is no longer required due to the study being complete (as per the above definitions), you will still need to ensure all research data/records management and storage procedures agreed to as part of your application are adhered to and carried out accordingly.

www.kcl.ac.uk
out accordingly.

If you do not start the project within three months of this letter please contact the Research Ethics Office.

Should you wish to make a modification to the project or request an extension to approval you will need approval for this and should follow the guidance relating to modifying approved applications:
http://www.icl.ac.uk/innovation/research/supportethics/applications/modifications.aspx

Please would you also note that we may, for the purposes of audit, contact you from time to time to ascertain the status of your research.

If you have any query about any aspect of this ethical approval, please contact your panel committee administrator in the first instance (http://www.icl.ac.uk/innovation/research/supportethics/contract.aspx)

We wish you every success with this work.

Yours sincerely,

[Signature]

Tom Billins, Senior Research Ethics Officer
For and on behalf of
Dr Anne Mullen, Chair
Biomedical Sciences, Dentistry, Medicine and Natural and Mathematical Sciences Research Ethics Subcommittee (BDM RESC)
ETHICAL CLEARANCE CERTIFICATE

TOPIC: DEVELOPMENT AND PRELIMINARY EVALUATION OF A SELF MANAGEMENT PROGRAMME FOR NON-SPECIFIC CHRONIC LOW BACK PAIN IN RURAL NIGERIA

BY: IGWESI-CHIDOB, CHINONSO N.

FOR: A PhD PROPOSAL OF THE DEPARTMENT OF PHYSIOTHERAPY, SCHOOL OF MEDICINE, KINGS COLLEGE LONDON, UNIVERSITY OF LONDON, UK

This research project on the above topic was reviewed and approved by the University of Nigeria Health Research Ethics Committee. This certificate is valid for one year from date of issue.

Prof. R.E Umeh
Chairman Health Research Ethics Committee

Date: 28/09/13
YOU WILL BE GIVEN A COPY OF THIS INFORMATION SHEET

TITLE OF STUDY: BARRIERS AND FACILITATORS TO SELF-MANAGEMENT FOR CHRONIC NON-SPECIFIC LOW BACK PAIN IN A RURAL NIGERIAN COMMUNITY: NIGERIAN BASED STUDY

We would like to invite you to participate in this Postgraduate research project. You should only participate if you want to; choosing not to take part will not disadvantage you in any way. Before you decide whether you want to take part, it is important for you to understand why the research is being done and what your participation will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information.

This study is being conducted as part of a PhD at King's College London.

The study aims to find out about your back pain including what you think caused it, how long you think it will last, the effects it has on your life, and your beliefs about how to treat it. We would like to find out how you cope with your back pain, and how effectively you manage your back pain at the moment. This study will also explore what you believe about health in general, your understanding of health, and healthy behaviours, factors that you think might influence your health and if there is anything you wish to change about your health or health behaviours. Questions about your family's daily activities will also be asked.

The study will help us to understand more about back pain and help us develop treatments for chronic low back pain in rural Nigeria.

We would like to talk to adults aged 30 to 70 years living in this community who have chronic low back pain, meaning low back pain that has lasted for more than 12 weeks.

People younger than 30 years or older than 70 years, with low back pain of less than 12 weeks duration or pain in the upper back area; those who have history of cancer or symptoms including numbness in any area of the body apart from the back and legs; or women who are pregnant will not be eligible to participate in this study. Please let us know beforehand if you have been involved in any other study during the last year.

If you agree to participate in this study, you will be visited at home or asked to come to your local primary health care centre at a convenient time for an interview with the researcher lasting for a maximum of one hour. When you come for the interview, you will be given a consent form and asked to sign or make a thumbprint on it if you wish to participate in the study. You will be interviewed on your own to ensure that what we discuss is confidential. The interview will be
recorded, subject to your permission. You will be interviewed only once on a particular day. The tape recordings of your interview will be deleted after it has been transcribed (written down).

This is a low risk study and the questions should not distress you. However, if you do become distressed or embarrassed at any point during the interview, you do not have to answer the questions and can end the interview at this point. If you decide to take part you are still free to withdraw from the study at any time and without giving a reason.

There is no direct benefit to you from participating in this study. However we hope it will help us understand more about back pain in Nigeria and how to treat it. We will give you a copy of the results of this study if you would like to see it.

All the information you give us is completely confidential. We will remove anything that can identify you from any information you give us. Apart from the study team, no one else will have access to the data we have collected. You are free to withdraw any information you have already provided up until it is transcribed for use in the final report by September 30, 2014.

If you have any questions or require more information about this study, please contact the researcher using the following contact details:

Chinonso. N. Igwesi-Chidobe,
Department of Physiotherapy,
Division of Health & Social Care Research,
School of Medicine,
King’s College London
London SE1 1UL
United Kingdom.
E-mail: chinonso.igwesi-chidobe@kcl.ac.uk
Phone number: +44 207 848 6679

If this study has harmed you in any way, you can contact King’s College London using the details below for further advice and information:

Dr Emma Godfrey,
Department of Physiotherapy,
Division of Health & Social Care Research,
School of Medicine,
King’s College London
London SE1 1UL
United Kingdom.
E-mail: emma.l.godfrey@kcl.ac.uk
Postal address: SE1 1UL
Phone number: +44 20 7848 6283
APPENDIX 4: CONSENT FORM (PATIENTS IN QUALITATIVE STUDY)

Please complete this form after you have read the Information Sheet and/or listened to an explanation about the research.

Title of Study: BARRIERS AND FACILITATORS TO SELF-MANAGEMENT FOR CHRONIC NON-SPECIFIC LOW BACK PAIN IN A RURAL NIGERIAN COMMUNITY: NIGERIAN BASED STUDY

King’s College Research Ethics Committee Ref: BDM/12/13-123

Thank you for considering taking part in this research. The person organising the research must explain the project to you before you agree to take part. If you have any questions arising from the Information Sheet or explanation already given to you, please ask the researcher before you decide whether to join in. You will be given a copy of this Consent Form to keep and refer to at any time.

You will be provided with travel expenses to attend the health centre in Nigeria.

Please tick

• I understand that if I decide at any time during the research that I no longer wish to participate in this project, I can notify the researchers involved and withdraw from it immediately without giving any reason. Furthermore, I understand that I will be able to withdraw my data up to the point after publication (September 30, 2014).

• I consent to the processing of my personal information for the purposes explained to me. I understand that such information will be handled in accordance with the terms of the UK Data Protection Act 1998.

Participant’s Statement:

I ________________________________________________________________________________

agree that the research project named above has been explained to me to my satisfaction and I agree to take part in the study. I have read both the
notes written above and the Information Sheet about the project, and understand what the research study involves.

Signed                                      Date

Investigator’s Statement:
I, CHINONSO IGWESI-CHIDOBE confirm that I have carefully explained the nature, demands and any foreseeable risks (where applicable) of the proposed research to the participant.

Signed                                      Date

The information you have submitted will be published as a report; please indicate whether you would like to receive a copy.

Yes  No

I understand that confidentiality and anonymity will be maintained and it will not be possible to identify me in any publications

Yes  No

I agree to be contacted in the future by King’s College London researchers who would like to invite me to participate in follow up studies to this project, or in future studies of a similar nature.

Yes  No

I consent to my interview being audio recorded

Yes  No

Please inform the researcher if you are currently involved or have been involved in any other research studies in the last 12 months.

Yes  No
APPENDIX 5: SCREENING FOR RED FLAGS

ENGLISH VERSION

1. Do you have weakness, heaviness or paralysis of your legs or any part of your body?
2. Do you have difficulty controlling your urine or faeces?
3. Do you lack sensation anywhere in your body (if yes probe to determine if it is around the buttocks or private part)?
4. Have you had fever or any illness or been admitted in the hospital recently?
5. Have you had a fall or any accident recently?
6. Have you lost weight recently?
7. Are you 70 years or above?
8. Have you ever had cancer?
9. Have you been on drugs or are you currently on any drugs? For what?
10. Do you have wounds anywhere on your body?

INCLUDE SOMEONE NEGATIVE TO ALL OF THE ABOVE AND IN ADDITION IS:

11. Not pregnant
12. Can hear well, speak well, and is coherent

IGBO VERSION

1. I nwere ahu mkponwu ebe o bula na ahu gi?
2. I na anu nsi ma o bu ma mmamiri na ahu gi?
3. o nwere ebe o bula na ahu gi i naghi ama ma mmadu metu ebe ahu aka?
4. I ria go ahu ma o bu rahu na ulo ogwu mgbe eteghi aka?
5. I dara ada ma o bu nwee ihe mberede oge eteghi aka?
6. I tara ahu oge eteghi aka?
7. Idi aho iri asaa ma o bu karia?
8. I nweela kansa (cancer) mbu?

9. I na anu ogwu ugbu a? maka gini?
10. I nwere onya ebe o bula na ahu gi?
## APPENDIX 6: PATIENTS’ INTERVIEW GUIDE (ENGLISH)

### Chronic low back pain beliefs, impact and coping strategies

- Can you tell me about your back pain?
- When did it start and how would you describe the pain?
- What do you think caused your back pain and how do you feel about it?
- How long do you think your back pain will last?
- How does your back pain have the most impact in your life?
- What treatments have you had for your back pain?
- How do you deal with your back pain on a day to day basis?
- Would you consider changing the way you are currently managing your back pain?

### Needs assessment for chronic low back pain

- Self-management is the ability of someone who has a chronic condition to manage the symptoms, treatment, consequences and lifestyle changes to control the condition...... Example is malaria management in Nigeria...... Would you be willing to adopt a self-management strategy for your back pain?
- How would you prefer the self-management package? Individual or group-based? At home, health centre or community? Written, in what language? Diagrammatic, verbal, phone or any other methods?
- Are there other considerations you wish to add about your back pain?
- Are there other things you wish to add about your health?

### Health beliefs

- What makes someone healthy?
- Do you consider yourself healthy now?
- What do you do and where do you go when you are sick?
- What would help you to have better health? Do you have these?
- Is there anyone/anything that influences your health?
- What are the things you do that are not very healthy? What would you do about these?

### Daily activities

- Please describe your daily activities from waking up in the morning to going to bed at night
- Please describe your family’s daily activities

### Conclusion

- Please is there anything you wish to add to any of the topics we covered today?
  Thank you very much for your time.
APPENDIX 7: PATIENTS’ INTERVIEW GUIDE (IGBO)

Chronic low back pain beliefs

- I nwere ike igwa m maka ukwu mgbu gi?
- Kedu mgbe o malitere? Biko kowaa mgbu a?
- Kedu ihe ichere butere ukwu mgbu gi a? Kedu ka obi di gi gbasara mgbu a?
- Kedu mgbe o di gi ka mgbu a ga akwusi?
- Kedu ka ukwu mgbu gi a si emetuta ndu gi n’ uzo puru iche?
- Kedu ogwugwo i nwertara maka ukwu mgbu gi a?
- Kedu ka i si ebi na agbanyeghi ukwu mgbu gi?
- I ga-acho igbanwe etu isi ebi ma na agwo ukwu mgbu gi a? Maka gini?

Self-management and needs assessment for chronic low back pain

- Self-management bu usoro mmadu nwere oria nke notere aka si elodo onwe ya anya ma na-agwo ejiri mara oria ya, ma tugharia etu o si ebi ndu ya iji weee mee ka oria ya ahu na ebelata. Dika onye obula si egbochi ma na-agwo malaria n’obodo anyi bu Nigeria. I ga anabata udi usoro a maka ukwu mgbu gi?
- Kedu ka i si choo usoro a? Otu na otu ka o bu imekota ya onu? N’ulo, ulo ogwu, ka o bu n’ime obodo? Nke edere ede-kedu asusu ichoro? Nke esere ese, okwu onu, igwe ekwe nti ka o bu n’ uzo ozo?
- O nwere ihe ndi ozo i choro i kwu maka ukwu mgbu gi?
- O nwere ihe ndi ozo i choro i kwu maka ahu ike gi?

Health beliefs

- Kedu ihe na-emekwa i choro i kwu maka ahu ike?
- I were onwe gi ka onye nwere ahu ike ugbu a?
- Kedu ihe na-emekwa i choro i kwu maka ahu ike?
- Kedu ihe ga-enyere gi aha ahu ike karia ka i nwere ugbu a? I nwere ihe ndi a?
- O nwere ihe ma o bu mmadu na-emetuta ahu ike n’ uzo o bu?
- Kedu ihe na-emekwa i choro i kwu maka ahu ike gi? Kedu ihe i ga-emekwa ihe ndia?

Daily activities

- Biko kowaa ihe niile i na-emekwa i bu o bu n’ututu ruo n’abali?
- Biko kowaa ihe ndi ezi n’ulo gi na-emekwa i bu o bu n’ututu ruo n’abali?

Conclusion

- Biko o nwere ihe i choro itinye na ihe niile anyi kpara n’ubochi taa? Ekene diri gi nke ukwu.
APPENDIX 8: BODY CHART (ENGLISH AND IGBO)

ENGLISH VERSION OF THE BODY CHART WITH SOCIO-DEMOGRAPHIC DATA

BODY CHART: Please mark the area of your body where you are having the pain

Please indicate your worst and best back pain levels on the straight line by marking 2 corresponding points. Please also describe your current pain level in relation to your worst and best back pain experience.

No pain

worse pain I ever felt
Biko kanye ihe ebe gosiri mgbu kacha mgbu i nwegoro maka ukwu mgbu gi a. Biko kowaara m ka ukwu mgbu gi a di ugbua. Were ihe nkanye gi wee maa atu.

Enweghi mgbu

Mgbu kacha mgbu nwegoro
YOU WILL BE GIVEN A COPY OF THIS INFORMATION SHEET

TITLE OF STUDY: BARRIERS AND FACILITATORS TO SELF-MANAGEMENT FOR CHRONIC NON-SPECIFIC LOW BACK PAIN IN A RURAL NIGERIAN COMMUNITY: NIGERIAN BASED STUDY

We would like to invite you to participate in this postgraduate research project. You should only participate if you want to; choosing not to take part will not disadvantage you in any way. Before you decide whether you want to take part, it is important for you to understand why the research is being done and what your participation will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information.

This study is being conducted as part of a PhD at King’s College London.

The study aims to explore your beliefs about back pain. We would also like to discuss the types of treatment you offer to people with back pain.

The study will help us to understand more about back pain and may help us develop treatments for low back pain in rural Nigeria.

We would like to talk to practitioners and other people aged 18 years or over such as doctors, physiotherapists, traditional healers, herbalists and spiritualists who are consulted by the people of this community for conditions like chronic low back pain. By chronic low back pain we mean lower back pain that has lasted for more than 12 weeks. We want to understand more about your beliefs about health and illness. We would also like to ask you questions about chronic low back pain and how you currently manage or treat it.

If you agree to participate in this study, you will be interviewed in your office at a convenient time by the researcher and it will last for a maximum of one hour. Before the interview, you will be given a consent form and asked to sign or make a thumbprint on it if you wish to participate in the study. You will be interviewed on your own to ensure that what we discuss is confidential. The interview will be recorded, subject to your permission. You will be interviewed only once on a particular day. The tape recordings of your interview will be deleted after it has been transcribed (written down).

This is a low risk study and the questions should not distress you. However, if you do become distressed or embarrassed at any point during the interview, you do not have to answer the questions and can end the interview at this point. If you decide to take part you are still free to withdraw from the study at any time and without giving a reason.
There is no direct benefit to you from participating in this study. However, we hope it will help us understand more about back pain in Nigeria and how it is treated. We will give you a copy of the results of this study if you would like to see it.

All the information you give us is completely confidential. We will remove anything that can identify you from any information you give us. Apart from the study team, no one else will have access to the data we have collected. You are free to withdraw any information you have already provided up until it is transcribed for use in the final report by September 30, 2014. Please let us know beforehand if you have been involved in any other study during the last year.

If you have any questions or require more information about this study, please contact the researcher using the following contact details:

Chinonso. N. Igwesi-Chidobe,
Department of Physiotherapy,
Division of Health & Social Care Research,
School of Medicine,
King’s College London
London SE1 1UL
United Kingdom.
E-mail: chinonso.igwesi-chidobe@kcl.ac.uk
Phone number: +44 207 848 6679

If this study has harmed you in any way, you can contact King’s College London using the details below for further advice and information:

Dr Emma Godfrey,
Department of Physiotherapy,
Division of Health & Social Care Research,
School of Medicine,
King’s College London
London SE1 1UL
United Kingdom.
E-mail: emma.l.godfrey@kcl.ac.uk
Postal address: SE1 1UL
Phone number: +44 20 7848 6283
APPENDIX 10: CONSENT FORM (PRACTITIONERS)

Please complete this form after you have read the Information Sheet and/or listened to an explanation about the research.

Title of Study: BARRIERS AND FACILITATORS TO SELF-MANAGEMENT FOR CHRONIC NON-SPECIFIC LOW BACK PAIN IN A RURAL NIGERIAN COMMUNITY: NIGERIAN BASED STUDY

King’s College Research Ethics Committee Ref: BDM/12/13-123

Thank you for considering taking part in this research. The person organising the research must explain the project to you before you agree to take part. If you have any questions arising from the Information Sheet or explanation already given to you, please ask the researcher before you decide whether to join in. You will be given a copy of this Consent Form to keep and refer to at any time.

Please tick or initial

- I understand that if I decide at any time during the research that I no longer wish to participate in this project, I can notify the researchers involved and withdraw from it immediately without giving any reason. Furthermore, I understand that I will be able to withdraw my data up to the point after publication

- I consent to the processing of my personal information for the purposes explained to me. I understand that such information will be handled in accordance with the terms of the UK Data Protection Act 1998.

Participant's Statement:

I ____________________________________________ agree that the research project named above has been explained to me to my satisfaction and I agree to take part in the study. I have read both the notes written above and the Information Sheet about the project, and understand what the research study involves.

Signed ___________________________ Date ___________________________

Investigator's Statement:
I, CHINONSO IGWESI-CHIDOBE confirm that I have carefully explained the nature, demands and any foreseeable risks (where applicable) of the proposed research to the participant.

Signed

Date

The information you have submitted will be published as a report; please indicate whether you would like to receive a copy.

Yes  No

I understand that confidentiality and anonymity will be maintained and it will not be possible to identify me in any publications

Yes  No

I agree to be contacted in the future by King’s College London researchers who would like to invite me to participate in follow up studies to this project, or in future studies of a similar nature.

Yes  No

I consent to my interview being audio recorded

Yes  No

Please inform the researcher if you are currently involved or have been involved in any other research studies in the last 12 months. This is to exclude any potential confounders to this study.

Yes  No
APPENDIX 11: PRACTITIONERS’ INTERVIEW GUIDE (ENGLISH AND IGBO)

ENGLISH VERSION OF THE INTERVIEW GUIDE FOR PRACTITIONERS MANAGING CHRONIC LOW BACK PAIN

- Chronic back pain is defined as pain in the lower back lasting more than 3 months. Have you ever treated someone with chronic back pain? What kind of treatments do you offer them?
- How do you consider your treatment of chronic back pain?
- Are there other treatment options out there? How does your treatment compare with these other ones?
- Would you be interested in learning about other management strategies for chronic back pain?
- Do you think you might recommend these to someone who consulted you?
- What do you think of self-management of chronic back pain?
- Please what other conditions do you usually treat and how do you treat them?
- What do you understand by illness? What causes illness in your opinion?
- What do you understand by health and healthy behaviour?
- Is there anything else you wish to add to the topics we discussed today?

Thank you very much for your time

IGBO VERSION OF THE INTERVIEW GUIDE FOR PRACTITIONERS MANAGING CHRONIC LOW BACK PAIN

- Ukwu mgbu nke notere aka bu mgbu na ukwu azu mmadu nke nokariri onwa ato. O nwela ndi igworo ukwu mgbu ha? Kedu udi ogwugwo i nyere ha?
- Kedu ka isi ahu uzo isi agwo ukwu mgbu?
- O nwere uzo ozo e si agwo ukwu mgbu? Kedu uzo nke ka mma, nke gi ka o bu uzo ndi ozo a?
- I ga-acho imuta uzo ndi ozo e si agwo ukwu mgbu?
- I ga-acho i kuziri ndi i na-agwo uzo ndi a?
- Kedu ihe i chere maka mmadu iji aka ya agwo ukwu mgbu ya?
- Biko kedu oria ndi ozo i na-agwo? Kedu ka i si agwo ha?
- Kedu ihe ighotara bu oria? Kedu ihe na-ebute oria n’obi gi?
- Gini ka i ghotara bu ahu ike na omume na-akwado ahu ike?
- O nwere ihe i choro itinye na ihe niile anyi kpara ubochi taa?

Ekene diri gi nke ukwu.
APPENDIX 12: REFLECTIVE DIARY (PRACTITIONERS)

10-15/9/2013

It appears that alternative practitioners, such as the herbalists and chemists think I am a drug law enforcement agent from mainstream health care. One alternative practitioner refused to be interviewed and many others appear to be on the defensive when answering my questions. They kept emphasizing that they referred back pain patients to mainstream health care when pain did not resolve, which I think may be because they are afraid of being penalised by me – the supposed drug law enforcement agent from mainstream health care!
APPENDIX 13: ETHICAL APPROVALS FOR PSYCHOMETRIC TESTING AND SURVEY

Chinonso Igwesi-Chidozie
Room 3.11 Department of Physiotherapy
School of Medicine
3rd Floor Shepherds House
King's College London
Guy's Campus
SE1 1UL

16 June 2014

Dear Chinonso Igwesi-Chidozie


Review Outcome: Full Approval

Thank you for sending in the amendments/clarifications requested to the above project. I am pleased to inform you that these meet the requirements of the BDM RESC and therefore that full approval is now granted.

Please ensure that you follow all relevant guidance as laid out in the King's College London Guidelines on Good Practice in Academic Research [http://www.kcl.ac.uk/collegepolicies/academicresearch/index.jsp?Id=247].

For your information ethical approval is granted until 02/06/2017. If you need approval beyond this point you will need to apply for an extension to approval at least two weeks prior to this explaining why the extension is needed. (Please note however that a full re-application will not be necessary unless the protocol has changed). You should also note that if your approval is for one year, you will not be sent a reminder when it is due to lapse.

Ethical approval is required to cover the duration of the research study up to the conclusion of the research. The conclusion of the research is defined as the final data or event detailed in the study description section of your approved application form (usually the end of data collection when all work with human participants will have been completed), not the completion of data analysis or publication of the results.

For projects that only involve the further analysis of pre-existing data, approval must cover any period during which the researcher will be accessing or evaluating individual sensitive and/or un-anonymised records.

Note that after the point at which ethical approval for your study is no longer required due to the study being complete (as per the above definitions), you will still need to ensure all research data/records management and storage procedures agreed to as part of your application are adhered to and carried
out accordingly.

If you do not start the project within three months of this letter please contact the Research Ethics Office.

Should you wish to make a modification to the project or request an extension to approval you will need approval for this and should follow the guidance relating to modifying approved applications: http://www.icl.ac.uk/innovation/research/supportethics/applications/modifications.aspx

Please would you also note that we may, for the purposes of audit, contact you from time to time to ascertaining the status of your research.

If you have any query about any aspect of this ethical approval, please contact your panel committee administrator in the first instance (http://www.icl.ac.uk/innovation/research/supportethics/contact.aspx)

We wish you every success with this work.

Yours sincerely,

[Signature]

Tom Billins, Senior Research Ethics Officer
For and on behalf of
Dr Anne Mullen, Chair
Biomedical Sciences, Dentistry, Medicine and Natural and Mathematical Sciences Research Ethics Subcommittee (BDM RESC)
ETHICAL CLEARANCE CERTIFICATE

TOPIC: DEVELOPMENT AND PRELIMINARY EVALUATION OF A SELF MANAGEMENT PROGRAMME FOR NON-SPECIFIC CHRONIC LOW BACK PAIN IN RURAL NIGERIA

BY: IGWESI-CHIDOBE, CHINONSO N.

FOR: A PhD PROPOSAL OF THE DEPARTMENT OF PHYSIOTHERAPY, SCHOOL OF MEDICINE, KINGS COLLEGE LONDON, UNIVERSITY OF LONDON, UK

This research project on the above topic was reviewed and approved by the University of Nigeria Health Research Ethics Committee. This certificate is valid for one year from date of issue.

Prof. R.E Umeh
Chairman Health Research Ethics Committee

Date: 28th August, 2013
Dear Nonso,

Of course you may translate the tool. I’ll be honored!

==========================================
Manny Halpern, PhD
Certified Professional Ergonomist (CPE)
Certified in Evidence-based Design (EDAC)
Occupational & Industrial Orthopaedic Center (OIOC)

www.oioc.org
NYU Hospital for Joint Diseases
Associate Research Professor
NYU School of Medicine - Department of Orthopedics
NYU Langone Medical Center
63 Downing Street| New York, NY | 10014
( 212.652.1929 6 212.255 6754 6917-239-1555
* manny.halpern@nyu.edu / manny.halpern@nyumc.org
http://www.madisonwhoswho.com/member_profile.php?id=486290

Hello Chinonso,

Thank you for sending all these documents.

By this email, we give you permission to proceed with the translation of the HADS, ready by December 2015. Please find attached the linguistic validation guidelines to help you with the translation.

We look forward to hearing from you with updates on your translation work. For all correspondence regarding this matter, please mention reference 35843.

All the best,

Lyra Lavazais
Mapi Research Trust
Information Support Unit
Expansion of the scope of PROQOLID (www.proqolid.org): over 65 ClinROs now described! ...and more ClinROs will be added soon!

Hi

Thanks for your interest in the FABQ. It is in the public domain and in principle I am happy for it to be translated into any language. However, translating and re-standardising a psychometric questionnaire into another language is a highly technical and complex business. Without being rude, can I check you have the necessary expertise and experience, or at least have a psychologist who can collaborate with you on this? Best wishes

gordon

Thanks Prof Gordon for your reply.

This project is supervised by Dr Emma Godfrey (a licensed Psychologist and lecturer in Health Psychology), Dr Isaac Sorinola and Prof. Sheila Kitchen (both are Physiotherapists).

Furthermore, I intend to use the Beaton et al's guidelines, 2000 for the translation.

My 3 supervisors are copied in this e-mail.

Please I hope these address your concerns?

With highest regards,

Nonso

Hi

Sounds good! Best wishes with your PhD

gordon

Dear Prof Anne,

Please I write to ask for your permission to translate/adapt the coping strategies Questionnaire into Igbo (one of the 3 main Nigerian languages).

This is to enable me use this measure to assess how people with non-specific chronic low back pain in a rural Nigerian context coped with their back pain-one of the objectives of my PhD.

Expecting to hear from you and thank you very much.

With highest regards,

Nonso

Absolutely! And good luck with your research.
Anne Gross

Dear Prof Roland,

Please I write to ask for your permission to translate/adapt the Roland Morris Disability Questionnaire into Igbo (one of the 3 main Nigerian languages).

This is to enable me use this measure to assess the impact of non-specific chronic low back pain in a rural Nigerian context—one of the objectives of my PhD.

Expecting to hear from you and thank you very much.

With highest regards,

Nonso

Thank you. Yes, please go ahead. Conditions for making translations are on the website: www.rmdq.org. Please abide by the principles set out for translation. Once complete, you must make a copy of the translated questionnaire available to me to put up on the website, and also provide a summary of the method you used to translate it.

Good luck!

Martin

Professor Martin Roland
RAND Professor of Health Services Research
Institute of Public Health
Forvie Site
University of Cambridge School of Clinical Medicine
Box 113 Cambridge Biomedical Campus
Cambridge
CB2 0SR

mr108@cam.ac.uk
P/A Helen Ludford, 01223 330320, hml34@medschl.cam.ac.uk

Cambridge Centre for Health Services Research website: www.cchsr.iph.cam.ac.uk

Dear Prof Liz,

Please I write to ask for your permission to translate/adapt the Brief Illness Perception Questionnaire into Igbo (one of the 3 main Nigerian languages).

This is to enable me use this measure to assess the influence of beliefs on the impact of non-specific chronic low back pain in a rural Nigerian context—one of the objectives of my PhD.

Expecting to hear from you and thank you very much.
With highest regards,

Nonso

Dear Nonso

Yes you may. I would like to receive a copy of your translation if that is possible so that others may use in the future

Kind regards
Liz

Elizabeth Broadbent (PhD)
Senior Lecturer in Health Psychology
Dept of Psychological Medicine
Faculty of Medical and Health Sciences
The University of Auckland
New Zealand
e.broadbent@auckland.ac.nz
webpage

Dear Chinonso!
I am very pleased and honored that you will translate the Back Performance Scale to a Nigerian language!
I suppose that you will use an international guideline for the translation process, and from that perspective you have may permission.
May I ask you to please send me the translated instrument?
Good luck, and best regards from Liv Inger
Dear Chinonso N Igwesi-Chidobe,

You have my permission to use and translate the MSPSS into Igbo. I have attached a copy of the original English version of the scale and a document listing several articles that have reported...
on the psychometric properties of the MSPSS. Once you translate the scale, please send me a copy.

Also, it may be of some interest to you that there is a Hausa translation of the MSPSS (see attached). The translation was done by Ashiru Hamza (physioash@yahoo.com).

I hope your research goes well.

Best regards,
Greg Zimet
APPENDIX 15: PREFINAL MEASURES

INTRODUCTION: The aim of this research is to understand factors that are associated with back pain in order to inform the development of an intervention for it in rural Nigeria. It is therefore essential that you give us very accurate information. Please note that no answer is right or wrong, what is important is that you tell us the truth. Everything discussed today is completely confidential and will NOT be disclosed to anyone.

Then show document signed by the traditional head of the village explaining the study

SCREENING: RED FLAGS

- Do you have paralysis of any part of your body?
  - b. I nwere ahu mkponwu na ukwu gi ma o bu ebe o bula na ahu gi?
- Do you have difficulty controlling your urine or faeces?
  - b. I na anu nsi ma o bu ma mmamiri na ahu gi?
- Do you lack sensation in your buttocks or private parts?
  - b. I na enwe mkponu ahu na ike gi ma o bu ihe iji buru nwoke ma o bu nwanyi?
- Have you had fever or any illness or been admitted in the hospital recently?
  - b. I ria go ahu ma o bu rahu na ulo ogwu mgbe eteghi aka?
- Have you had a fall or any accident recently?
  - b. I dara ada ma o bu nwee ihe mberede oge eteghi aka?
- Have you lost weight recently?
  - b. I tara ahu oge eteghi aka?
- Is your pain worse when you are lying on your back or at night?
  - b. Azu ukwu mgbu gi o na aka njo ma I dinere na azu gi ma o bu na abali
- Are you 70 years or above?
  - b. Idi aho iri asaa ma o bu karia?
- Have you ever had cancer?
  - b. I nweela kansa (cancer) mbu?
- Have you been on drugs or are you currently on any drugs? For what?
  - b. I na anu ogwu ugbu a? maka gini?
- Do you have wounds anywhere on your body?
  - I nwere onya ebe o bula na ahu gi?

INCLUDE SOMEONE NEGATIVE TO THE ABOVE AND IN ADDITION IS:
- Aged 18 to 69 years, with back pain lasting for more than 12 weeks.
- Not pregnant
- Can hear well, speak well, and is coherent
### WHODAS 2.0 36-ITEM VERSION, INTERVIEWER-ADMINISTERED (World Health Organisation Disability Assessment Schedule)

*Instructions to the interviewer are written in bold and italics-do not read these aloud.*
*Text for the respondent to hear is written in standard print in blue or Igbo.*

**Read this text aloud**

### Section 1: Face sheet

<table>
<thead>
<tr>
<th>Complete</th>
<th>F1-F5 before starting each interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
<td>Respondent identity number</td>
</tr>
<tr>
<td>F2</td>
<td>Interviewer identity number</td>
</tr>
<tr>
<td>F3</td>
<td>Assessment time point (1, 2, etc.)</td>
</tr>
<tr>
<td>F4</td>
<td>Interview date</td>
</tr>
<tr>
<td>F5</td>
<td>Living situation at time of interview (circle only one)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Independent in community</th>
<th>Assisted living</th>
<th>Hospitalised</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day..............</td>
<td>Month.......</td>
<td>Year......</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

### Section 2: Demographic and background information

Ajuju onu a bu ndi World Health Organisation (WHO) weputara ya ka ewere ghota nsogbu ndi mmadu na enwe gbasara onodu ahu ike ha. Aziza gi niile no na akwukwo a bu naani maka iji wee mee ihe nyocha a burukwa ihe agaghi egosi ndi ozo. Ajuju a ga ewe nkeji iri na ise ma o bu iri abuo iji wee zachaa ya.

*For respondents from the general population (not the clinical population) say:*

O burugodi na inweghi ahuike ma o bu na inweghi nsogbu obula, e kwesiri m ijucha ajuju nile a, iji wee mee ka ihe nyochaa zuo oke.
### A1 Record sex as observed

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

### A2 Afo ole ka i di ugbua?

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>...............years</td>
</tr>
</tbody>
</table>

### A3 Afo ole ka owere gi igu akwukwo na ulo akwukwo, koleji ma o bu mahadum?

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>...............years</td>
</tr>
</tbody>
</table>

### A4 Gini bu onodu alumni na nwanyi gi ugbua? (select the single best option)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Anughi m di ma o bu nwunye</td>
<td>1</td>
</tr>
<tr>
<td>Ano m na anu m di na nwunye</td>
<td>2</td>
</tr>
<tr>
<td>A nuru m di ma o bu nwunye mana mu na ya ebighizi</td>
<td>3</td>
</tr>
<tr>
<td>Mu na di ma o bu nwunye m gbara alukwaghi m</td>
<td>4</td>
</tr>
<tr>
<td>Di m ma o bu nwunye m nwuru anwu</td>
<td>5</td>
</tr>
<tr>
<td>Mu na enyi m nwoke ma o bu nwanyi bi</td>
<td>6</td>
</tr>
</tbody>
</table>

### A5 Kedu uzo ka mma aga eji kowaa oru gi? (select the single best option)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Oru a na akwu m ugwo</td>
<td>1</td>
</tr>
<tr>
<td>E nwere m oru onwe m dika izu ahia ma o bu oru ugbo</td>
<td>2</td>
</tr>
<tr>
<td>A na m aru oru anaghi akwu m ugwo</td>
<td>3</td>
</tr>
<tr>
<td>Nwata akwukwo</td>
<td>4</td>
</tr>
</tbody>
</table>
Section 3: Preamble

**Say to respondent:**

Ajuju onu a bu maka nsogbu ndi mmadu na enwe na onodu ahu ike ha dika azu ukwu mgbu.

**Hand flashcard to #1 to respondent and say:**

Gbasara onodu ahu ike a, ihe m na akowa bu nsogbu nile i na enwe gbasara azu ukwu mgbu gi.

Chetakwa ka i buru onodu gbasara azu ukwu mgbu gi na obi ka i na aza ajuju ndi a. Mgbe m juo gi ajuju gbasara nsogbu i na enwe mgbe o bula i choro ime ihe, burukwa ihe ndi a na obi...

**Point to flashcard #1 and explain that ‘ihe  ira ahu’ putara:**

- Igbawanye oke mbo
- Mmekpa ahu ma o bu ihe mgbu
- Ime ihe nwanyo
- Mgbanwe ma o bu ihe di iche na uzo isi eme ihe

**Say to respondent:**

Mgabe i na aza ajuju a, aga m acho ka iche echiche maka ubochi iri ato gara aga. Aga m acho ka izaar ajuju ndia nile ka i na echeta udi nsogbu nile inwegoro mgbe i na eme ihe ndi i na emebe etu isi emebe ha na mbu ka mgbe ubochi iri ato gara aga.

**Hand flashcard #2 to respondent and say:**

Jiri usoro onu ogugu ndia mgbe i na aza ajuju ndi a.
Read the scale aloud:
Onweghi/Odighi, obere, ogafeghi oke, o siri ike, ogafere oke/enweghi m ike ime.

Ensure that the respondent can easily see the flashcards #1 and #2 throughout the interview

Section 4: Domain reviews

Domain 1: Cognition

Ugbu a, aga m aju gi ajuju gbasara etu isi aghota ihe na etu isi agwa mmadu okwu.

Show flashcards #1 and #2 to respondent

<table>
<thead>
<tr>
<th>Na ubochi iri ato gara aga, kedu ihe isi ike i na enwe na ihe ndia:</th>
<th>Onweghi/Odighi obere</th>
<th>ogafeghi oke</th>
<th>o siri ike</th>
<th>ogafere oke/enweghi m ike ime</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1.1</td>
<td>Echiche gi idigide na ihe i na eme ruo nkeji iri?</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>D1.2</td>
<td>Icheta ime ihe ndi di mkpa?</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>D1.3</td>
<td>i nyocha na ichoputa usoro iga eji gbo mkpa diri gi ubochi kwa ubochi?</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>D1.4</td>
<td>imuta ihe ohuru, dika imuta etu I ga esi aga ebe I gabeghi mbu?</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
Domain 2: Mobility

Ajuju m ga aju gi ugbu a bu maka nsogbu I na enwe na ikpaghari.

Show flashcards #1 and #2

| D2.1 | Ikwuru oto tee aka dika nkeji iri ato? | 1 | 2 | 3 | 4 | 5 |
| D2.2 | Ikwuru oto mgbe inoduchara ala? | 1 | 2 | 3 | 4 |
| D2.3 | Igaghari agaghari na ime ulo gi? | 1 | 2 | 3 | 4 | 5 |
| D2.4 | Isi na ulo gi puo apuo? | 1 | 2 | 3 | 4 | 5 |
| D2.5 | I ga ije tere aka dika otu kilometra (ma o bu ihe dika ya)? | 1 | 2 | 3 | 4 | 5 |

Domain 3: Self-care

Ajuju m ga aju gi ugbu a bu maka ihe isike I na enwe maka ilekota onwe gi anya.

Show flashcards #1 and #2
Kemgbe ubochi iri ato gara aga, kedu nsogbu I na enwe ime ihe ndi a:

<table>
<thead>
<tr>
<th></th>
<th>Onwe ghi/O dighi</th>
<th>obere</th>
<th>ogafeghi oke</th>
<th>o siri ike</th>
<th>ogafere oke/enweghi m ike ime</th>
</tr>
</thead>
<tbody>
<tr>
<td>D3.1 Isa ahu gi nile?</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D3.2 Iyinye akwa?</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D3.3 Iri nri?</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D3.4 Ino nani gi ubochi ole na ole?</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Domain 4: Getting along with people

Ajuju m ga aju gi ugbua bu maka ihe isike I na enwe ebe gi na ndi mmadu imekorita. Biko cheta na o bu soso ihe isike maka ihi azu mgbu gi. Ihe m na akowa bu nsogbu gbasara azu mgbu gi.

Show flashcards #1 and #2

<table>
<thead>
<tr>
<th></th>
<th>Onweg hi/Odig hi</th>
<th>obere</th>
<th>ogafeghi oke</th>
<th>o siri ike</th>
<th>ogafere oke/enweghi m ike ime</th>
</tr>
</thead>
<tbody>
<tr>
<td>D4.1 Imeso ndi I maghi omume?</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D4.2 Inogide na enyi gi na ndi ozo nwere?</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D4.3 Ihe I ga nke oma na etiti ndi gi na ha di na mma, ya na ezi n’ulo gi?</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D4.4 Imete enyi ohuru?</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D4.5 Mmekorita nwoke na nwanyi?</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Domain 5: Life activities

5(1): Household activities

Ugbu a, aga m aju gi ihe gbasara ihe ndi I na eme iji akwado ezi n’ulo gi, na ilekota ndi gi na ha bi ma o bu ndi no gi na akuku. Ihe ndi a gunyere isi nri, ihicha ulo, izuta ihe na ahia, ilekota mmadu na ilekota ihe ndi I nwere.

Show flashcards #1 and #2

<table>
<thead>
<tr>
<th>N’ihi azu mgbu gi, kamgbe ubochi iri ato gara aga, kedu nsogbu I na enwe ime ihe ndi a:</th>
<th>Onweghi /Odighi</th>
<th>obere</th>
<th>ogafeghi oke</th>
<th>o siri ike</th>
<th>ogafere oke/en weghi m ike ime</th>
</tr>
</thead>
<tbody>
<tr>
<td>D5.1 Ilekota oru diri gi na ezi n’ulo gi?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>D5.2 Ime ihe diri gi, ndi kachasi mkpa na ezi na ulo gi nke oma?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>D5.3 Irucha oru ile I kwesiri iru na ezi n’ulo gi?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>D5.4 I gbali ihu na aruchara oru diri gi na ezi na ulo gi ososo ka okwesiri?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

If any of the responses to D5.2-D5.5 are rated greater than none (coded as “1”), ask:

D5.01 Kamgbe ubochi iri ato gara aga, ubochi ole ka ibelatara oru ezi n’ulo ma o bu hapu kpam kpam oru ezi n’ulo gi n’ihi azu mgbu gi? | Record number of days........

If the respondent works (paid, non-paid, self-employed) or goes to school, complete questions D5.5-D5.10 on the next page. Otherwise, skip to D6.1 on the following page.
5(2): Work or school activities

Ugbu a, aga m aju gi ajuju gbasara oru gi ma o bu ihe ndi l na eme na ulo akwukwo

*Show flashcards #1 and #2*

| D5.5 | Oru diri gi ubochi kwa ubochi na ulo oru/ulo akwukwo gi? | 1 | 2 | 3 | 4 | 5 |
| D5.6 | Ime ihe ndi diri gi kachasi mkpa na ulo oru gi/ulo akwukwo gi nke oma? | 1 | 2 | 3 | 4 | 5 |
| D5.7 | Irucha oru nile ikwesiri iru? | 1 | 2 | 3 | 4 | 5 |
| D5.8 | Irucha oru gi ngwangwa ka okwesiri? | 1 | 2 | 3 | 4 | 5 |
| D5.9 | I wetunatara aka na oru gi maka ihi azu mgbu gi? | No | 1 |
| D5.10 | I ritere obere ego karia ka o | No | 1 |
If any of D5.5–D5.8 are rated greater than none (coded as “1”), ask:

| D5.02 | Na ubochi iri ato gara aga, ubochi ole ka I rughi oru okara ubochi ma o bu karia maka ihi azu mgbu gi? | Record number of days........... |

**Domain 6: Participation**

Ugbu a, aga m aju gi ajuju gbasara etu isi esonye na ihe gbasara obodo gi na ka onodu azu mgbu gi si emetuta gi na ezi n’ulo gi. Ufodu ajuju a nwere ike igbasara ndi i gabigara ubochi iri ato, mana ka I na aza ajuju ndi a, biko gbado anya na ubochi iri ato gara aga. Ozo, ana m echetara gi ka I zaa ajuju ndi a ka I na-eche banyere azu mgbu gi.

*Show flashcards #1 and #2*

<table>
<thead>
<tr>
<th>Ka mgbe abali iri ato gara aga:</th>
<th>Onwe ghi/O dighi</th>
<th>obere</th>
<th>ogafegh i oke</th>
<th>o siri ike</th>
<th>ogafer enweghi m ike ime</th>
</tr>
</thead>
<tbody>
<tr>
<td>D6.1</td>
<td>Kedu oke nsogbu i nwere na iso ihe di iche a na eme na obodo (dika mmemme ndi obodo, mmemme ulo uka ma o bu ihe ndi ozo di iche iche) dika etu onye o bula nwere ike ime?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>D6.2</td>
<td>Kedu oke nsogbu ole l nwere maka mgbochi ma o bu</td>
<td>1</td>
<td>2</td>
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<tr>
<td><strong>D6.3</strong></td>
<td>Kedu oke nsogbu i nwere na ibi na ugwu diri mmadu maka ihi etu ndi mmadu si akpaso gi agwa na etu ha si emeso gi omume?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td><strong>D6.4</strong></td>
<td>Oge ole ka itinyere na azu ukwu mgbu gi ma o bu ihe si na ya puta?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td><strong>D6.5</strong></td>
<td>Kedu oke uzo esi metuta nnuo ma o bu mkpuru obi gi maka ihi azu ukwu mgbu gi?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td><strong>D6.6</strong></td>
<td>Kedu oke azu ukwu mgbu gi si erida ma o bu metuta onodu ego gi ma o bu ego ndi ezi n’ulo gi?</td>
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<td>3</td>
<td>4</td>
</tr>
<tr>
<td><strong>D6.7</strong></td>
<td>Kedu oke nsogbu ezi n’ulo gi nwere maka ihi azu ukwu mgbu gi?</td>
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<td>3</td>
<td>4</td>
</tr>
<tr>
<td><strong>D6.8</strong></td>
<td>Kedu oke nsogbu i nwere na iji aka gi eme otutu ihe ga enye gi ezumike ma o bu obi uto?</td>
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<td>3</td>
<td>4</td>
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</tbody>
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<p>| | | | | |</p>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>H1</strong></td>
<td>Iji chikota ihe nile, na ubochi iri ato gara aga, na ime ubochi ole ka nsogbu ndi a biara?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>H2</strong></td>
<td>Na ubochi iri ato gara aga, na ime ubochi ole ka I na enweghi ike kpata kpata ime ihe I na adi eme na mbu ma o bu oru gi maka ihi azu ukwu mgbu gi?</td>
<td></td>
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</tr>
</tbody>
</table>

Record number of days.........
Nke a bu njedebe ajuju onu a. Ndewo maka isonye.

*WHODAS FLASHCARD 1

Health condition:
- Azu ukwu mgbu

Having difficulty with an activity means:
- Igbaawaye mbo
- Mmekpa ahu ma o bu ihe mgbu
- Ime ihe nwayo
- Mgbanwe na uzo isi eme ihe

Think about the past 30 days only.

*WHODAS FLASHCARD 2
ROLAND MORRIS DISABILITY QUESTIONNAIRE (RMDQ) with instructions

Mgbe o bula azu ukwu na egbu gi mgbe, I nwere ike ihu na ufodu ihe i na eme mgbe mbu nweziri ike ihia gi ahu ime. Ihe ndia edeputara bu etu ndi mmadu siri kowaa onwe ha mgbe ha na enwe azu ukwu mgbe. Mgbe i guo ha ma o bu mmadu aguoro gi ha, I nwere ike ifu na ufodu kowara ka o di gi ubochi taa. I na agu ihe ndia, ma o bu mmadu ana aguru gi ha, chee maka onwe gi ubochi taa. Mgbe o bula i guru, ma o bu mmadu guru gi nke kowari gi ubochi taa, Kanye ihe na ya ma o bu gwa onye guputara gi ya ka o kanye ihe na ya. O buru na okwu o bula, akowaghi gi, hapu okwu ahu ma jee na nke ozo. Chetakwa ka i kanye ihe soso mgbe i kwetara na o kowara gi ubochi taa.

1. Ana m ano n’ulo, o foro ntakiri ka o buru mgbe nile n’ihi azu ukwu m.
2. Ana m anoghari otutu oge iji nweta onodu ga adiri azu ukwu m mma.
3. Eji m nwayo aga ije karia etu okwesiri maka ihi azu ukwu m
4. Maka ihi azu ukwu m, anaghi m aru oru o bula m na arubu n’ulo ma o bu akuku ulo.
5. Maka ihi azu ukwu m, ana m ejide ihe ulo aka ma m na arigo ulo elu.
6. Maka ihi azu ukwu m, ana m edina ala izu ike mgbe mgbe karia na mbu.
7. Maka ihi azu ukwu m, ana m ejide ihe aka wee bilie na oche nwere aka.
8. Maka ihi azu ukwu m, ana m ejisi ike achota ndi ozo ka ha mere m ihe.
9. Ana m eji nwayo nwayo eyiri akwa karia ka m kxesiri maka ihi azu ukwu m.
10. Ana m akwu oto obere oge maka ihi azu ukwu m.
11. Maka ihi azu ukwu m, ana m ejisi ike ghara ihu ehu ma o bu sekpurul ala.
12. O na ahia m ahu isi na oche ebili maka ihi azu ukwu m.
13. Azu ukwu m na-egbu m mgbe, oforo ntakiri ka o buru mgbe niile.
14. Ona ahia m ahu itughari ma m dina ala maka ihi azu ukwu m.
15. Agu anaghi agu m nke oma maka ihi azu ukwu mgbe m
16. Ana m enwe nsogbu iyinye akpukpu ukwu m maka ihi mgbe di na azu ukwu m.
17. Ana m aga soso ije di ntakiri maka ihi azu ukwu mgbe m
18. Anaghi m arahu ura nke oma maka ihi azu ukwu m.

19. Maka ihi azu ukwu mgbu m, onye ozo na enyere m aka i yiri akwa

20. Ana m anodu ala otutu oge na ubochi maka azu ukwu m

21. Ana m ezere oru ike di n’ulo maka ihi azu ukwu m

22. Maka ihi azu ukwu mgbu m, ana m enwe mbakasi ahu na iwe oku ebe ndi mmadu no karia mgbe mbu.

23. Maka ihi azu ukwu m, ana m eji nwayo nwayo arigo ulo elu ma o bu igbago ugwu karia na mbu.

24. Ana m edina ala otutu oge maka ihi azu m

**11-Point box scale (BS-11)**

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<th>8</th>
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</tr>
</tbody>
</table>

- **Obere mgbu**
- mgbu agafeghi oke
- mgbu ojoo ezie
- mgbu ojoo nke ukwu

**Enweghi ihe mgbu**

**Mgbu kachasi mgbu**
Hospital Anxiety and Depression Scale (HADS)

Ndi na afu ndi oria n’ulo ogwu maara na ihe na emetùta obi mmadu dj mkpa na otutù oria. O bụrụ na onye na afu gi maara banyere ihe ndị a, o ga-enwe ike inyere gi a ka nke oma.

Ajuju nchoputa a bu iji nyere onye na afu gi aka iji mara etu obi dj gi. A ga a guru gi ihe ndị a, ma zakwaa nke biara gi na obi ngwangwa iji kowaa etu obi di gi [kemgbe izu uka gara aga].

Egbuna oge iji zaa aziza ndị a, aziza i zara ozugbo bu ya nwere ike ikowa etu obi di gi karia aziza i chere eche oge tere aka wee zaa.

<table>
<thead>
<tr>
<th>A</th>
<th>Onwe m adighi m juu:</th>
</tr>
</thead>
<tbody>
<tr>
<td>O foro ntakiri ka o buru mgbe nile</td>
<td>3</td>
</tr>
<tr>
<td>Otutu oge</td>
<td>2</td>
</tr>
<tr>
<td>Site n’oge ruo n’oge, kwa mgbe kwa mgbe</td>
<td>1</td>
</tr>
<tr>
<td>Adighi m enwe ya ma oli</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D</th>
<th>O di m ka a na m emezi ihe nwayo nwayo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oforo ihe nta ka o buru mgbe nile</td>
<td>3</td>
</tr>
<tr>
<td>Otutu mgbe</td>
<td>2</td>
</tr>
<tr>
<td>Mgbe ufodu</td>
<td>1</td>
</tr>
<tr>
<td>Odighi ma oli</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A</th>
<th>Ihe ndị ahu na amasibu m ka na amasim</th>
</tr>
</thead>
<tbody>
<tr>
<td>Etu m si enwe ya na mbu kpom kwem</td>
<td>0</td>
</tr>
<tr>
<td>O buchaghi etu m si enwe na mbu</td>
<td>1</td>
</tr>
<tr>
<td>Nwantakiri</td>
<td>2</td>
</tr>
<tr>
<td>Oraka ahu</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D</th>
<th>A na m enwe ujo dika ume mmiri a na efepu m na afo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odighi ma oli</td>
<td>0</td>
</tr>
<tr>
<td>Kwa mgbe kwa mgbe</td>
<td>1</td>
</tr>
<tr>
<td>Otutu mgbe</td>
<td>2</td>
</tr>
<tr>
<td>O foro ntakiri ka o buru mgbe nile</td>
<td>3</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>A</th>
<th>A na m enwe ujo ka ihe di egwu o na akwado ime</th>
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</thead>
<tbody>
<tr>
<td>Kpomkwem ma dikwa njo nke ukwu</td>
<td>3</td>
</tr>
<tr>
<td>Ee, ma obughi na njo nke ukwu</td>
<td>2</td>
</tr>
<tr>
<td>Obere ma onaghi eche m uche</td>
<td>1</td>
</tr>
<tr>
<td>Odighi ma oli</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D</th>
<th>A kwusiri m inwe mmasị n’etu m di n’ile anya</th>
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<tbody>
<tr>
<td>Kpom kwem</td>
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</tr>
<tr>
<td>Anaghi m elebara ya anya dika m kwesiri</td>
<td>2</td>
</tr>
<tr>
<td>E nwere m ike i havu ilebara ya anya dika o kwesiri</td>
<td>1</td>
</tr>
<tr>
<td>A na m elekota ya anya etu okwesiri</td>
<td>0</td>
</tr>
</tbody>
</table>
**SCORING:** Add the As=Anxiety; add the Ds=Depression; 0-7=Normal; 8-10=Borderline abnormal; 11-21=Abnormal

<table>
<thead>
<tr>
<th>D</th>
<th>E nwere m ike ichi ochi ma hukwa ihe ntochi na uwa m</th>
</tr>
</thead>
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<tr>
<td></td>
<td>Oke m nwere ike na mbu 0</td>
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<tr>
<td></td>
<td>O bughi etu odi na mbu ugbu a 1</td>
</tr>
<tr>
<td></td>
<td>Odighizi nnoo etu o di na mbu ugbu a 2</td>
</tr>
<tr>
<td></td>
<td>Odighi ma oli 3</td>
</tr>
<tr>
<td>A</td>
<td>Echiche nchekasi na aga na uche m</td>
</tr>
<tr>
<td></td>
<td>Oge nke ukwuu 3</td>
</tr>
<tr>
<td></td>
<td>Otutu oge 2</td>
</tr>
<tr>
<td></td>
<td>Obughii kwa mgbe 1</td>
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<tr>
<td></td>
<td>Obere oge 0</td>
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<table>
<thead>
<tr>
<th>D</th>
<th>A na m enwe onu</th>
</tr>
</thead>
<tbody>
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<td></td>
<td>Odighi ma oli 3</td>
</tr>
<tr>
<td></td>
<td>O bughi otutu oge 2</td>
</tr>
<tr>
<td></td>
<td>Mgbe ufodu 1</td>
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<tr>
<td></td>
<td>Otutu oge 0</td>
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</tbody>
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<table>
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<tr>
<th>A</th>
<th>E nwere m ike i no jii wee zuo ike</th>
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<tr>
<td></td>
<td>Kpom kwe m 0</td>
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<tr>
<td></td>
<td>O na-emekari 1</td>
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<td>O bughi otutu mgbe 2</td>
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<td>Odighi ma oli 3</td>
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<th>D</th>
<th>A ga m enwenwu obi uto na igu akwukwo di mma ma o bu redio ma o bu ihe a na eme na TV</th>
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<td>Mgbe ufodu 1</td>
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<tr>
<td></td>
<td>O bughi otutu mgbe 2</td>
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<tr>
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<td>Oraka ahu 3</td>
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<tr>
<th>A</th>
<th>Oke ujo na abia m na ike</th>
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<td>Otutu oge n’ezie 3</td>
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<tr>
<td></td>
<td>Otutu mgbe 2</td>
</tr>
<tr>
<td></td>
<td>Obuchaghi otutu oge 1</td>
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<tr>
<td></td>
<td>Odighi ma oli 0</td>
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</tbody>
</table>

<table>
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<th>D</th>
<th>A na m en anya i nwe anuri na ihe ga eme</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Ka m si eme na mbu 0</td>
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<tr>
<td></td>
<td>Etu na eruchaghi etu m si eme na mbu 1</td>
</tr>
<tr>
<td></td>
<td>Kpom kwem etu na erughi etu o di na mbu 2</td>
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<tr>
<td></td>
<td>Oraka ahu 3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A</th>
<th>Adi m aghariigha, enweghi m ike i no nwayo dika a ga asi na m gaghariba agari</th>
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<tr>
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<td>Nke ukwuu n’ezie 3</td>
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<tr>
<td></td>
<td>Otutu oge 2</td>
</tr>
<tr>
<td></td>
<td>Obughii nke ukwuu 1</td>
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<tr>
<td></td>
<td>Odighi ma oli 0</td>
</tr>
</tbody>
</table>
PAIN COPING STRATEGIES QUESTIONNAIRE

Ndi mmadu ndi na enwe ahu mgbu achoputala uzo ole na ole ha na eji na-anagide ihe mgbu ha. Nke a gunyere I na-agwa onwe ha okwu nkasiobi mgbu o bula ha na enwe ahu mgbu, isonyere na ufodu emume di iche iche. Ihe na-esota ugbu a bu usoro ndi n’enwe ahu mgbu kowaputara ha na eme mgbu ha na enwe ahu mgbu. Maka ihe omume nke o bula, biko were ihe skelu a (ihe a akara aka) gosi ihe ndi a, etu I na-esi etinye onwe gi na ihe omume ahu mgbu o bula I na enwe ahu mgbu, were ihe dika EFU/ONWEGHI MGBE gosi na INAGHI eme ihe ahu ma oli mgbu o bula I na-enwe ahu mgbu, were akara nke ATO gosi na I na eme ihe ahu MGBE UFODU I na enwe ahu mgbu, were kwa akara nke ISII gosi na I na eme ihe ahu MGBE NILE I na enwe ahu mgbu. Chetakwa na i nwekwara ike I were akara o bula n’ime ihe otutu skelu a (ihe a akara aka) kowaa ya.

<table>
<thead>
<tr>
<th>EFU/ONWEGHI MGBE</th>
<th>MGBE UFODU</th>
<th>MGBE NILE</th>
</tr>
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<tbody>
<tr>
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<td>2</td>
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<td>5</td>
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<tr>
<td>6</td>
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</tr>
</tbody>
</table>

Mgbe m na enwe ahu mgbu...
1. Ana m agbali ka m chefue ya ma o bu mee ka o dika na obughi na ahu m ka ahu mgbu ahu di site na ibu na echiche na obu na ahu onye ozo.
2. Ana m esi n’ulo ebe m no puo ga mee ihe dika I ga ahia ma o bu I ga lee ihe nkiri onyo onyoo
3. Ana m agbali chee echiche ihe na enye obi uto.
4. Anaghi m eche ya na o bu ahu mgbu, kama a na m ewere ya na o ihe na emetuta m na ahu ma o bu ihe na ekpo oku.
5. Okacha m njo ma dikwa m ka ogaghi adikwa mma
6. Ana m agwa onwe m, ka m nwee mmuo siri ike ma jisie ike na-agbali n’agbanyeghi ahu mgbu ahu
7. A na m agu akwukwo
8. A na m agwa onwe m na m ga-emer ihe mgbu a.
9. A na m agu onuogugwa n’isi m na o bu na ekwe ukwe na obi m
10. A na m ewe ya dika ihe ozo na eme m, ihe dika ihe mmekpa ahu ozo di a otita ngwere
11. O bu ihe jogburu onwe ya, dikwa m ka o na anyigbu m ma o bu akuda m.
12. A na m egwure ufodu egwu di iche n’ime uche m ma o bu ata orji isi iji wepu uche m na ihe mgbu a.
13. O di m ka ndu m di enweghi isi
14. A mara m na otu ubochi, otu onye ga agbatara m oso enye maaka mee ka ihe mgbu a puo nwa obere oge.
15. Ana m ekpere Chineke ka o ghara inote aka
16. Ana m ejisi ike ghara iche ya ka o bu ahu m, kama ka ihe iche na ebe m no.
17. A naghi m eche maka ihe mgbu a.
18. Ana m ejisi ike eche maka afo di n’ihu, etu ihe nile ga adi mgbu m chupugoro mgbu a.
19. A na m agwa onwe m na onaghi egbu m.
20. A na m agwa onwe m na agagli m ekwe ka ihe mgbu a gbochie ihe o bula m kwsiri ime.
21. Anaghi m etinyere ya uche o bula.
22. E nwere m okwukwe na ebe ndi dibia bekee no, na otu ubochi aga enwe ogwugwo maka ihe mgbu m.
23. Na agbanyegehi ka osina di njo, a mara m na m ga anagide ya.
24. A na m eme ka aga asi na o noghi ebe ahu
25. O na eche m echiche mgbe nile ma ihe a oga ebi
26. A na m eji obi m na atughari ihe obi uto mere mgbe gara aga.
27. A na m eche maka ndi mmadu o na ato m uto mu na ha imeko ihe
28. A na m ekpe ekpere ka ihe mgbu a kwusi.
29. A na m erube na obi m, ma o bu were ya na ihe mgbu a anoghi n’ime ahu m
30. A na m aga n’ihu ebe ihe dika onweghi ihe mere
31. A na m ahuta ya dika ihe ima aka wee hapu ime ka o buru ihe ga enye m nsogbu ma o bu mekpaa m ahu.
32. Na agbanyegehi na o na egbu mgbu, a na m aga n’iru na eme ihe m na eme
33. O na-adì m ka agaghi m anagidezi ya ozo
34. A na m agbali I na anoyere ndi mmadu ozo
35. A na m elaghar a anya
36. A na m adabere na okwukwe m na Chineke.
37. O na adim ka agaghi m emeli ihe a gaba n’iru
38. A na m eche maka ihe ndi na ato m uto ime.
39. A na m eme ihe o bula iji ewepu obi m na ihe mgbu a.
40. A na m eme ihe na eme m obi uto dika ile igwe onyonyo TV ma o bu ige egwu.
41. A na m eme ka agasi na o bugh akuku ahu m.
42. A na m eme ihe mmeghari ahu dika ije ozi ime ulo ma o bu oru ndi ozo.

Dabere na ihe niile ị na-emeh iji n’agide mgbu ọrụ, na otu ubochi, kedu ọjọ ihe ọrụ o di ọrụ ka i nwere ebe mgbu ọrụ a no? Biko gwam ka m Kane gburugburu (circle) na ihe ogu una kwe kwe ka o bu Kane ihe gburugburu na nke i choro. Na-echeta, ị nwere ihe ọkụwa m na ọbụ Kane na ihe ogu una bula na ihe skelu a:

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<tr>
<td>Dabere na ihe niile ị na-emeh iji n’agide mgbu ọrụ, na otu ubochị, kedu etu ọrụ i nwere ihe ọkụwa ya? Biko gwam ka m Kane gburugburu (circle) na ihe ogu una kwe kwe ka o bu Kane ihe gburugburu na nke i choro. Na-echeta, ị nwere ihe ọkụwa ma o bu Kane na ihe ogu una bula na ihe skelu a:</td>
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<tr>
<td>O kweghi m ebelata</td>
<td>A na m ebelatatu ya</td>
<td>A na m ya ebelata kpamkpam ma oli</td>
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MULTIDIMENSIONAL SCALE OF PERCEIVED SOCIAL SUPPORT

Ntuziaka: Anyị nwere mmasị na etú i si na-echi banyere ihe ndị na-esọ okwu a edeputara. Kpachara anya guo ma o bu gee nti na ihe nkwuputa a edeputara n’otu n’otu. Na-egosi etú j na-echi banyere nkwuputa a n’otu n’otu.

Tinye akara ma o bu kwuo otu (1) ma o buru na i jusiri ike kpam kpam
Tinye akara ma o bu kwuo abuo (2) ma o buru na i jusiri ike
Tinye akara ma o bu kwuo ato (3) ma o buru na i juru aju ntakiri
Tinye akara ma o bu kwuo ano (4) ma o buru na onweghi ebe i kwu akwu.
Tinye akara ma o bu kwuo ise (5) ma o buru na i kwenyere ntakiri
Tinye akara ma o bu kwuo isi (6) ma o buru na i kwenye siri ike
Tinye akara ma o bu kwuo asaa (7) ma o buru na i kwenyesi ike kpam kpam.

1. O nwere onye dikarisiri iche na ano m nso mgbe m no na mkpa
   1  2  3  4  5  6  7  SO

2. O nwere onye dikarisiri iche na eso m ekere oke na obi uto m ma o bu n’iru uju m.
   1  2  3  4  5  6  7  SO

3. Ndi ezi n’ulo m na agbali si ike i nyere m aka
   1  2  3  4  5  6  7  Fam

4. A na m enweta agba m ume na nkwado m choro na ezi n’ulo m
   1  2  3  4  5  6  7  Fam

5. E nwere m onye dikarisiri iche na aburu m ezi nkasi obi
   1  2  3  4  5  6  7  SO

6. Ndi enyi m na-agbali n’ezie i nyere m aka
   1  2  3  4  5  6  7  Fri

7. E nwere m ike i chekwube ma o bu i dabere na ndi enyi m mgbe ihe mebie
   1  2  3  4  5  6  7  Fri

8. Mu na ndi ezi n’ulo m nwere ike ikpa maka nsogbu m
   1  2  3  4  5  6  7  Fam

9. E nwere m ndi enyi nwere ike iso m kere oke mgbe m no na ọnụ ma o bu mgbe m na eri uju
   1  2  3  4  5  6  7  Fri

10. O nwere onye dikarisiri iche na ndu m, ihe banyere m gbasara/na emetuta na obi
    1  2  3  4  5  6  7  SO
11. Ndi ezi n’ulo m di njikere i nyere m aka ime mkpebi

1 2 3 4 5 6 7 Fam

12. Mu na ndi enyi m nwere ike ikpa maka nsogbu m

1 2 3 4 5 6 7 Fri

The items tended to divide into four factor groups relating to the source of the social support, namely family (Fam), friends (Fri) or significant other (SO).
OCCUPATIONAL RISK FACTOR QUESTIONNAIRE

Ka anyi wee nwee ike i nyere gi aka nke oma, o di mkpa ka anyi mara maka oru I na aru. Biko zaa ajuju ndi aga aju gi. Biko zaa ha nile.

Biko kowaa ihe bu isi ihe di na oru I na aru

..........................................................................................................................................................................................

Biko zaa EE ma o bu MBA iji zaa ajuju ndi a n’otu na otu

1. I nwere ike I nara ezumike maka ubochi o bula na oru gi tinyere ezumike nke eweputara gi n’ime ubochi o bula?
   Ee Mba

2. I na achoputakari na o nwere mgbe I nweghi ike iru oru n’ihi ihe ndaputa, dika mgbe igwe eji aru oru mebiri ma o bu na ngwa oru adighi?
   Ee Mba

3. I nwere ike ichikwa na ihazicha etu oru si agara gi?
   Ee Mba

4. Nchikwa na nhazi oru gi o dabere na ihe ndi ozo (dika igwe oru machine, igwe computer, ndi azuma ahia)
   Ee Mba

5. I na aru oru na onodu nmanye dika oge, ezughi ike ma o bu ngwa ngwa I gbanari oge?
   Ee Mba

Oge ole ka o na ewe gi ime ihe ndi a n’ulo oru, inodu ala/ma o bu ikwuru oto

6. Ihuru ala ntakiri, aka gi agaghi eru ikpere gi
   i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme
   ii. Ihe dika pecenti iri na oge oru
      (ma o bu ihe kariri okara otu ubochi n’ime otu izu uka nwere ubochi asaa)
   iii. Ihe dika pecenti iri abuo na ise na oge oru
(ma o bu otu ubochi na ihe kariri okara n’ime otu izu uka nwere ubochi asaa)

iv. Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa

v. Ihe dika pecenti iri asaa na ise na oge oru
(ma o bu ubochi ise na ihe erughi okara otu ubochi na ime otu izu uka nwere ubochi asaa)

vi. O foro ntakiri ka o buru mgbe nile

7. Ihuru ala ka aka gi gafee ikpere gi

i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme

ii. Ihe dika pecenti iri na oge oru
(ma o bu ihe kariri okara otu ubochi n’ime otu izu uka nwere ubochi asaa)

iii. Ihe dika pecenti iri abuo na ise na oge oru
(ma o bu otu ubochi na ihe kariri okara n’ime otu izu uka nwere ubochi asaa)

iv. Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa

v. Ihe dika pecenti iri asaa na ise na oge oru
(ma o bu ubochi ise na ihe erughi okara otu ubochi na ime otu izu uka nwere ubochi asaa)

vi. O foro ntakiri ka o buru mgbe nile

8. Inyaghari ma o bu ihighari etiti ahu karia ihe dika digrii iri ano na ise na ihulata gaa na akuku

i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme

ii. Ihe dika pecenti iri na oge oru
(ma o bu ihe kariri okara otu ubochi n’ime otu izu uka nwere ubochi asaa)

iii. Ihe dika pecenti iri abuo na ise na oge oru
(ma o bu otu ubochi na ihe kariri okara n’ime otu izu uka nwere ubochi asaa)

iv. Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa

v. Ihe dika pecenti iri asaa na ise na oge oru
(ma o bu ubochi ise na ihe erughi okara otu ubochi na ime otu izu uka nwere ubochi asaa)

vi. O foro ntakiri ka o buru mgbe nile

Ihe dika oge ole ka i na eji eme ihe ndi a n’ulo oru gi (kwuo iji gosi nke bu aziza gi ka e were akara gosi nke bu aziza gi n’oge edeputara maka nke o bula)

1. Ibulite ihe buru ibu na anyi aru ihe dika mgbati aka gi
   
i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme
   
ii. Ihe dika pecenti iri na oge oru
       (ma o bu ihe kariri okara otu ubochi n’ime otu izu uka nwere ubochi asaa)

   iii. Ihe dika pecenti iri abuo na ise na oge oru
       (ma o bu otu ubochi na ihe kariri okara n’ime otu izu uka nwere ubochi asaa)

   iv. Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa

   v. Ihe dika pecenti iri asaa na ise na oge oru
      (ma o bu ubochi ise na ihe erughi okara otu ubochi na ime otu izu uka nwere ubochi asaa)

vi. O foro ntakiri ka o buru mgbe nile

2. Iji otu aka buru ibu
   
i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme
   
ii. Ihe dika pecenti iri na oge oru
       (ma o bu ihe kariri okara otu ubochi n’ime otu izu uka nwere ubochi asaa)

   iii. Ihe dika pecenti iri abuo na ise na oge oru
       (ma o bu otu ubochi na ihe kariri okara n’ime otu izu uka nwere ubochi asaa)

   iv. Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa

   v. Ihe dika pecenti iri asaa na ise na oge oru
      (ma o bu ubochi ise na ihe erughi okara otu ubochi na ime otu izu uka nwere ubochi asaa)

vi. O foro ntakiri ka o buru mgbe nile
3. Ibughari ihe ndi na adighi mfe I jide aka ma na enweghikwa ebe a na-ejide ya aka
   i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme
   ii. Ihe dika pecenti iri na oge oru
       (ma o bu ihe kariri okara otu ubochi n’ime otu izu uka nwere ubochi asaa)
   iii. Ihe dika pecenti iri abuo na ise na oge oru
       (ma o bu otu ubochi na ihe kariri okara n’ime otu izu uka nwere ubochi asaa)
   iv. Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa
   v. Ihe dika pecenti iri asaa na ise na oge oru
      (ma o bu ubochi ise na ihe erughi okara otu ubochi na ime otu izu uka nwere ubochi asaa)
   vi. O foro ntakiri ka o buru mgbe nile

4. I kwa ma o bu l dor o ibu
   i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme
   ii. Ihe dika pecenti iri na oge oru
       (ma o bu ihe kariri okara otu ubochi n’ime otu izu uka nwere ubochi asaa)
   iii. Ihe dika pecenti iri abuo na ise na oge oru
       (ma o bu otu ubochi na ihe kariri okara n’ime otu izu uka nwere ubochi asaa)
   iv. Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa
   v. Ihe dika pecenti iri asaa na ise na oge oru
      (ma o bu ubochi ise na ihe erughi okara otu ubochi na ime otu izu uka nwere ubochi asaa)
   vi. O foro ntakiri ka o buru mgbe nile

5. Ibu ihe di aro dika pound iri ruo iri ato ma o bu kilogram ise ruo iri na ano ma o bu ihe na anyi ka mmiri lita ise ruo lita iri na ano
   i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme
   ii. Ihe dika pecenti iri na oge oru
       (ma o bu ihe kariri okara otu ubochi n’ime otu izu uka nwere ubochi asaa)
   iii. Ihe dika pecenti iri abuo na ise na oge oru
iv. *Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa*

v. *Ihe dika pecenti iri asaa na ise na oge oru*

(ma o bu ubochi ise na ihe erughi okara otu ubochi na ime otu izu uka nwere ubochi asaa)

vi. *O foro ntakiri ka o buru mgbe nile*

6. Ibu ihe di arora karia pound iri ato ma o bu kilogram iri na ano ma o bu ihe na anyi ka mmiri lita iri na ano

i. *Oraka ahu/o foro nta ka o buru ihe anaghi eme eme*

ii. *Ihe dika pecenti iri na oge oru*

(ma o bu ihe kariri okara otu ubochi n’ime otu izu uka nwere ubochi asaa)

iii. *Ihe dika pecenti iri abuo na ise na oge oru*

(ma o bu otu ubochi na ihe kariri okara n’ime otu izu uka nwere ubochi asaa)

iv. *Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa*

v. *Ihe dika pecenti iri asaa na ise na oge oru*

(ma o bu ubochi ise na ihe erughi okara otu ubochi na ime otu izu uka nwere ubochi asaa)

vi. *O foro ntakiri ka o buru mgbe nile*

7. I bu ibu kariri pound iri ma o bu kilogram ise/ihe na anyi ka mmiri lita ise gaa ruo ihe kariri feet iri ano ma o bu site na ulo gi ruo ulo agbata obi gi

i. *Oraka ahu/o foro nta ka o buru ihe anaghi eme eme*

ii. *Ihe dika pecenti iri na oge oru*

(ma o bu ihe kariri okara otu ubochi n’ime otu izu uka nwere ubochi asaa)

iii. *Ihe dika pecenti iri abuo na ise na oge oru*

(ma o bu otu ubochi na ihe kariri okara n’ime otu izu uka nwere ubochi asaa)

iv. *Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa*

v. *Ihe dika pecenti iri asaa na ise na oge oru*
(ma o bu ubochi ise na ihe erughi okara otu ubochi na ime otu izu uka nwere ubochi asaa)

vi. O foro ntakiri ka o buru mgbe nile

8. Inodu ala

i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme

ii. Ihe dika pecenti iri na oge oru
    (ma o bu ihe kariri okara otu ubochi n’ime otu izu uka nwere ubochi asaa)

iii. Ihe dika pecenti iri abuo na ise na oge oru
    (ma o bu otu ubochi na ihe kariri okara n’ime otu izu uka nwere ubochi asaa)

iv. Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa

v. Ihe dika pecenti iri asaa na ise na oge oru
    (ma o bu ubochi ise na ihe erughi okara otu ubochi na ime otu izu uka nwere ubochi asaa)

vi. O foro ntakiri ka o buru mgbe nile

9. Igbusa ikpere na ala, ma o bu ihungu ala

i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme

ii. Ihe dika pecenti iri na oge oru
    (ma o bu ihe kariri okara otu ubochi n’ime otu izu uka nwere ubochi asaa)

iii. Ihe dika pecenti iri abuo na ise na oge oru
    (ma o bu otu ubochi na ihe kariri okara n’ime otu izu uka nwere ubochi asaa)

iv. Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa

v. Ihe dika pecenti iri asaa na ise na oge oru
    (ma o bu ubochi ise na ihe erughi okara otu ubochi na ime otu izu uka nwere ubochi asaa)

vi. O foro ntakiri ka o buru mgbe nile

10. I rigoro ulo elu ma o bu elu obe/lada

i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme

ii. Ihe dika pecenti iri na oge oru
(ma o bu ihe kariri okara otu ubochi n’ime otu izu uka nwere ubochi asaa)

iii. Ihe dika pecenti iri abuo na ise na oge oru
(ma o bu otu ubochi na ihe kariri okara n’ime otu izu uka nwere ubochi asaa)

iv. Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa

v. Ihe dika pecenti iri asaa na ise na oge oru
(ma o bu ubochi ise na ihe erughi okara otu ubochi na ime otu izu uka nwere ubochi asaa)

vi. O foro ntakiri ka o buru mgbe nile

11. Iji ngwa oru aka oku latric a na-øjide n’aka aru oru (dika drills, saws, jack hammer)
   i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme
   ii. Ihe dika pecenti iri na oge oru
        (ma o bu ihe kariri okara otu ubochi n’ime otu izu uka nwere ubochi asaa)
   iii. Ihe dika pecenti iri abuo na ise na oge oru
        (ma o bu otu ubochi na ihe kariri okara n’ime otu izu uka nwere ubochi asaa)

iv. Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa

v. Ihe dika pecenti iri asaa na ise na oge oru
(ma o bu ubochi ise na ihe erughi okara otu ubochi na ime otu izu uka nwere ubochi asaa)

vi. O foro ntakiri ka o buru mgbe nile

12. Inya ugbo ala ma o bu igwe ugbo ndi eji aru oru (gwongworo, ugbo ala ukwu, ugbo okporo igwe, forklifts)
   i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme
   ii. Ihe dika pecenti iri na oge oru
        (ma o bu ihe kariri okara otu ubochi n’ime otu izu uka nwere ubochi asaa)
   iii. Ihe dika pecenti iri abuo na ise na oge oru
        (ma o bu otu ubochi na ihe kariri okara n’ime otu izu uka nwere ubochi asaa)

iv. Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa
v. Ihe dika pecenti iri asaa na ise na oge oru
   (ma o bu ubochi ise na ihe erughi okara otu ubochi na ime otu izu uka nwere ubochi asaa)

vi. O foro ntakiri ka o buru mgbe nile

13. Iru oru na ala na ami ami ma o bu ebe ala adighi larii
   i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme
   
   ii. Ihe dika pecenti iri na oge oru
        (ma o bu ihe kariri okara otu ubochi n’ime otu izu uka nwere ubochi asaa)

   iii. Ihe dika pecenti iri abuo na ise na oge oru
        (ma o bu ubochi na ihe kariri okara n’ime otu izu uka nwere ubochi asaa)

   iv. Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa

   v. Ihe dika pecenti iri asaa na ise na oge oru
      (ma o bu ubochi ise na ihe erughi okara otu ubochi na ime otu izu uka nwere ubochi asaa)

   vi. O foro ntakiri ka o buru mgbe nile

14. Iru oru n’elu ihe/ebe di elu (dika n’elu ulo, lada, obe na ndi ozo)
   i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme
   
   ii. Ihe dika pecenti iri na oge oru
        (ma o bu ihe kariri okara otu ubochi n’ime otu izu uka nwere ubochi asaa)

   iii. Ihe dika pecenti iri abuo na ise na oge oru
        (ma o bu ubochi na ihe kariri okara n’ime otu izu uka nwere ubochi asaa)

   iv. Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa

   v. Ihe dika pecenti iri asaa na ise na oge oru
      (ma o bu ubochi ise na ihe erughi okara otu ubochi na ime otu izu uka nwere ubochi asaa)

   vi. O foro ntakiri ka o buru mgbe nile

Ugboro ole ka i na ebuli ihe di aro dika nke:
15. Ihe na erughi pound iri ma o bu kilogram ise ma o bu ihe na anyi ka mmiri lita ise
   i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme
   ii. orughi otu ugboro n’ime otu awa
   iii. site otu ugboro rue ugboro iri n’ime otu awa
   iv. site iri na otu ruo ugboro iri ato n’ime otu awa
   v. ihe kariri ugboro iri ato n’ime otu awa.

16. Ihe di pound iri ruo pound iri ato ma o bu kilogram ise ruo kilogram iri na ano ma o bu ihe na anyi ka mmiri lita ise ruo mmiri lita iri na ano
   i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme
   ii. orughi otu ugboro n’ime otu awa
   iii. site otu ugboro rue ugboro iri n’ime otu awa
   iv. site iri na otu ruo ugboro iri ato n’ime otu awa
   v. ihe kariri ugboro iri ato n’ime otu awa.

17. Ihe kariri pound iri ato ma o bu kilogram iri na ano ma o bu ihe na anyi ka mmiri lita iri na ano

   i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme
   ii. orughi otu ugboro n’ime otu awa
   iii. site otu ugboro rue ugboro iri n’ime otu awa
   iv. site iri na otu ruo ugboro iri ato n’ime otu awa
   v. ihe kariri ugboro iri ato n’ime otu awa.

Imeela maka oge i nyere anyi!
### THE BRIEF ILLNESS PERCEPTION QUESTIONNAIRE

1. **Kedu oke ole azu mgbu gi si emetuta ndu gi?**

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   Ometutaghi
   M ma oli
   ometutara ndu m nke ukwuu

2. **Ogologo oge ole ka o di gi ka azu mgbu gi ga anogide?**

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   obere
   ebighi ebi

3. **Kedu oke njikwa i chere na i nwere ebe azu mgbu gi no?**

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   Njikwa
   adighi ma
   njikwa nke ukwuu

4. **Kedu oke ole o di gi ka ogwugwo i na a nata ga enyere azu mgbu gi a ka?**

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   onaghi
   enyere m
   o na enyere m aka nke ukwuu

5. **Kedu mgbaama ole i na e nweta na ihe gbasara azu ukwu mgbu gi?**

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   Odighi ihe
   mgbaama
   otutu ihe mgbaama na enye oke nsogbu

6. **Kedu oke nchegbu i nwere maka azu ukwu mgbu gi?**

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   O naghi
   eche m uche
   o na eche m uche nke ukwuu

7. **Kedu oke ole i chere na i ghotara azu ukwu mgbu gi?**

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   Aghotaghi m
   ya ma oli
   aghotara m ya, o doo m anya nke oma

8. **Kedu oke ole azu ukwu mgbu gi ji emetuta gi na uche ma o bu obi?**

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   (dika, o na eme gi iwe, ujo, obi ojoo ma o bu obi i da mba/ieda mmuo gi?)
9. Biko deputa ma o bu kwuo n’usoro ihe ato kacha mkpa i kwere na o bu ha butere azu mgbu gi. Ihe ndi kacha mkpa butere m ya bu:

1. 

2. 

3. 


FEAR AVOIDANCE BELIEFS QUESTIONNAIRE

___________________________________________ Ubochi: _____________________

Nke a bu ufulo ihie ndi oria ndi ozo gwara anyi maka ahu mgbu ha. Kanye ihie ma o bu kwuo onu ogu nke o bu site na efu ruo na isii (0-6) iji kowaa udi mmeghari ahu dika ihulata ala, ibuli ihie, igma ije ma o bu inya ugbo ala ga esi emetuta azu mgbu gi.

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1. Ihe mgbu m bu Mmeghari ahu butere ya
2. Mmeghari ahu na eme ka mgbu m kara njo
3. Mmeghari ahu nwere ike inye m mmeru ahu na azu m.
4. Ekwesighi m ime mmeghari ahu nke nwere ike ime ka mgbu m kara njo
5. Enweghi m ike ime mmeghari ahu nke nwere ike ime/na eme ka mgbu m kara njo

Ihe ndi a edeputara gbasara etu oru l na aru si emetuta azu mgbu gi ma o bu etu o ga esi emetuta azu mgbu gi

6. Mgbu m bu oru m na aru butere ya ma o bu ihe mberede na ulo oru.
7. Oru m na aru na eme ka mgbu m ka njo.
8. Enwere m ihe i ti aka na obi maka mgbu m.
9. Oru m na aru bu oru ike nke ukwuu.
10. Oru m na aru na eme ma o bu ga eme ka mgbu m ka njo.
11. Oru m na aru nwere ike i meru m ahu na azu.
12. Ekwesighi m i bu ihe mgbu nke na egbu m ugbu a na aru oru m na aru.
13. Enweghi m ike ibu mgbu a m na enwe ugbu a na aru oru m na aru.
14. Enweghi m ike iru oru m na aru ruo mgbu ihe mgbu m natara ogwugwo.
15. Ecgehi m na m ga alaghachi na oru m na aru n’ime onwa ato
16. Ecgehi m na m ga enwe ike ilaghachi ozo na oru m na aru.
**The patient is to wear loose clothing and no shoes. The activities are explained and demonstrated to the patient. BPS scale: 0-15**

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<th>Tests</th>
<th>Performance</th>
<th>Scoring categories</th>
<th>Scores</th>
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| Sock test  | The patient is sitting on a high firm bench, the feet not reaching the floor. One leg is tested at the time—the least reach scored. Instruction: *jiri mkpisi aka abuo gi wee jide mkpisi ukwu gi ma o buru na isukoro ikpere gi?* | ➢ Can easily grab the toes with fingertips of both hands  
➢ Can grab the toes with fingertips, but with effort  
➢ Can reach beyond the malleoli, but not reach the toes  
➢ Can hardly, if at all, reach as far as to the malleoli | 0      |
|            |                                                                                               |                                                                                                                             | 1      |
|            |                                                                                               |                                                                                                                             | 2      |
|            |                                                                                               |                                                                                                                             | 3      |
| Pick-up test| The patient is standing on the floor. A curled piece of paper is dropped on the floor. Instruction: *tututa akwukwu a di n’ala? i nwere ike ya na uzo abuo ma o bu ato di iche iche i gosi na i na emegharinwu ahu?* | ➢ Can do the task with ease in varied ways  
➢ Can do the task with minor effort or some decreased flexibility  
➢ Can do the task with marked effort or lack of flexibility, may need support of hand on thigh  
➢ Cannot perform the task at all, or need external support | 0      |
|            |                                                                                               |                                                                                                                             | 1      |
|            |                                                                                               |                                                                                                                             | 2      |
|            |                                                                                               |                                                                                                                             | 3      |
| Roll-up test| The patient is lying supine on a firm mattress or plinth or table. Instruction: *jiri nwayo bilite nodu ala n’elu akwa, ukwu gi agbati a n’elu akwa, emegharighi aka gi?* | ➢ Can roll up with ease, to a long-sitting position  
➢ Can roll up with marked effort or partially to long-sitting position  
➢ Can roll up in supine position between the 8th and 12th thoracic vertebra  
➢ Can roll up in supine position above the 8th thoracic vertebra | 0      |
|            |                                                                                               |                                                                                                                             | 1      |
|            |                                                                                               |                                                                                                                             | 2      |
|            |                                                                                               |                                                                                                                             | 3      |
| Finger tip-to floor test| The patient is standing on the floor, feet 10cm apart and knees straight. Instruction: *metu aka n’ala ma o bu ruo ebe i nwere ike?* | ➢ Can reach to the floor, distance=0 cm  
➢ Can reach to a distance > 0 cm, ≤ 20cm  
➢ Can reach to a distance > 20cm, ≤ 40cm  
➢ Can reach to a distance > 40cm | 0      |
|            |                                                                                               |                                                                                                                             | 1      |
|            |                                                                                               |                                                                                                                             | 2      |
|            |                                                                                               |                                                                                                                             | 3      |
| Lift test | The patient is standing on the floor in front of a table. Instruction: *Can you repeat lifting this box, containing a sandbag of 5kg, for 1 minute, from the floor to the table* | ➢ Can do the lifting task > 15 times  
➢ Can do the lifting task > 10, ≤ 15 times  
➢ Can do the lifting task > 0, ≤ 10 times  
➢ Cannot do the lifting task = 0 | 0      |
|            |                                                                                               |                                                                                                                             | 1      |
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(height 76 cm) and back to the floor using an optional technique. The box, with grip: 1.35 kg, sized 0.36 x 0.36 x 0.25cm.

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APPENDIX 16: INFORMATION SHEET  
(PATIENTS IN QUANTITATIVE STUDIES)

REC Reference Number: BDM/13/14-99

YOU WILL BE GIVEN A COPY OF THIS INFORMATION SHEET

TITLE OF STUDY: IDENTIFICATION OF THE BIOPSYCHOSOCIAL FACTORS INFLUENCING FUNCTIONING IN PEOPLE LIVING WITH CLBP IN RURAL NIGERIA

We would like to invite you to participate in this Postgraduate research project. You should only participate if you want to; choosing not to take part will not disadvantage you in any way. Before you decide whether you want to take part, it is important for you to understand why the research is being done and what your participation will involve. Please take time to read or get people to read the following information carefully and discuss it with others if you wish. The research assistants will also orally explain all that is written here. Ask us if there is anything that is not clear or if you would like more information.

This study is being conducted as part of a PhD at King's College London.

The study aims to find out about your back pain and will involve assessing and interviewing you using some questionnaires that aim to explore how back pain has affected your life and how you have lived with your back pain. The interview will take about one hour. We would also like you to tell us what you understand by the questions in the questionnaires and if there are questions that are not clear.

The study will help us to understand more about back pain and help us develop treatments for chronic low back pain in rural Nigeria.

We would like to talk to adults aged 18 to 69 years living in this community who have chronic low back pain, meaning low back pain that has lasted for more than 12 weeks.

People younger than 18 years or older than 69 years, with low back pain of less than 12 weeks duration or pain in the upper back area; those who have history of cancer or symptoms including numbness in any area of the body apart from the back and legs; or women who are pregnant will not be eligible to participate in this study. Please let us know beforehand if you have been involved in any other study during the last year.

If you agree to participate in this study, you will be asked to come to your local primary health care centre at a convenient time to meet with a researcher. When you come for the meeting, you will be given a consent form and asked to sign or make a thumbprint on it if you wish to participate in the study. You will be interviewed on your own either at your home or the health centre to ensure that what we discuss is confidential and this is subject to your preference/permission. You will be interviewed only once on a particular day.
Those participants who choose to be interviewed in the health centres and whose homes are far from the health centres will be given travel expenses.

This is a low risk study and the questions should not distress you. However, if you do become distressed or embarrassed at any point during the interview, you do not have to answer the questions and can end the interview at this point. If you decide to take part you are still free to withdraw from the study at any time and without giving a reason.

There is no direct benefit to you from participating in this study. However we hope it will help us understand more about back pain in Nigeria and how to treat it. We will give you a copy of the results of this study if you would like to see it.

All the information you give us is completely confidential. We will remove anything that can identify you from any information you give us. Apart from the study team, no one else will have access to the data we have collected. You are free to withdraw any information you have already provided up until it is written up in the final report by 28th February, 2015.

If you have any questions or require more information about this study, please contact the researcher using the following contact details:

Chinonso. N. Igwesi-Chidobe,
Department of Physiotherapy,
Division of Health & Social Care Research,
School of Medicine,
King's College London
London SE1 1UL
United Kingdom.
E-mail: chinonso.igwesi-chidobe@kcl.ac.uk
Phone number: +44 207 848 6679

AND

Dr Emma Godfrey,
Department of Physiotherapy,
Division of Health & Social Care Research,
School of Medicine,
King's College London
London SE1 1UL
United Kingdom.
E-mail: emma.i.godfrey@kcl.ac.uk
Postal address: SE1 1UL
Phone number: +44 20 7848 6283

If this study has harmed you in any way, or if you wish to make a complaint about the conduct of the study, you can contact King's College London using the details below for further advice and information: The Chair, BDM Research Ethics Subcommittee (RESP), rec@kcl.ac.uk.
APPENDIX 17: CONSENT FORM (PATIENTS IN QUANTITATIVE STUDIES)

Please complete this form after you have read the Information Sheet and/or listened to an explanation about the research.

Title of Study: IDENTIFICATION OF THE BIOPSYCHOSOCIAL FACTORS INFLUENCING FUNCTIONING IN PEOPLE LIVING WITH CLBP IN RURAL NIGERIA

King's College Research Ethics Committee Ref: BDM/13/14-99

Thank you for considering taking part in this research. The person organising the research must explain the project to you before you agree to take part. If you have any questions arising from the Information Sheet or explanation already given to you, please ask the researcher before you decide whether to join in. You will be given a copy of this Consent Form to keep and refer to at any time.

You will be provided with travel expenses to attend the health centre in Nigeria.

- I understand that if I decide at any time during the research that I no longer wish to participate in this project, I can notify the researchers involved and withdraw from it immediately without giving any reason. Furthermore, I understand that I will be able to withdraw my data up to the point after publication (December 30, 2016).

- I consent to the processing of my personal information for the purposes explained to me. I understand that such information will be handled in accordance with the terms of the UK Data Protection Act 1998.

Name
Age
Sex
Occupation
Religion
Marital status
Family type

Participant's Statement:

I

Please tick or initial
agree that the research project named above has been explained to me to my satisfaction and I agree to take part in the study. I have read both the notes written above and the Information Sheet about the project, and understand what the research study involves.

Signed

Date

Investigator’s Statement:
I, CHINONS OGWESI-CHIDODE confirm that I have carefully explained the nature, demands and any foreseeable risks (where applicable) of the proposed research to the participant.

Signed

Date

The information you have submitted will be published as a report; please indicate whether you would like to receive a copy.

Yes No

I understand that confidentiality and anonymity will be maintained and it will not be possible to identify me in any publications

Yes No

I agree to be contacted in the future by King’s College London researchers who would like to invite me to participate in follow up studies to this project, or in future studies of a similar nature.

Yes No

Please inform the researcher if you are currently involved or have been involved in any other research studies in the last 12 months.

Yes No
APPENDIX 18: TRAINING MATERIALS FOR COMMUNITY HEALTH WORKERS

A. PARTICIPANT RECRUITMENT: First explain the information sheet about the study, then screen participants that are interested, for those that are eligible based on the inclusion criteria, obtain signed consent using the consent forms.

B. INTRODUCTION: Start by introducing the study using the information sheet. Emphasize that this study will inform the development of an intervention for back pain in Nigeria. Consent must have been obtained and signed by the participant before being interviewed.

C. SCREENING QUESTIONS:
Ask each participant to touch all the areas where pain is felt on a body chart. For each screening question, give the patient the option of yes or no. If the patient answers yes, then probe further. Often, the patient might need to be included as 85% of all chronic low back pain cases are non—specific.

Ques 1 and 2: very important. Participants might give you slightly different explanation from what is here, however what you need to note is if is pain is present most times whether or not they are working or fluctuates and has persisted for more than 3 months.

Que. 3 ‘do you lack sensation anywhere in your body’. If participants answer yes then probe to know which part of the body. If there is a report of heaviness of the legs, they should be included in the study but if respondents report lacking sensation around the buttocks and/or perineal region, they should not be interviewed.

Que. ‘Have you been on drugs or are you currently on drugs’, if respondent answers yes. Then probe, if the drugs are taken for common ailments such as pain, malaria, typhoid etc, the respondent can be interviewed. However, if respondent is taking medications for serious conditions like cancer, HIV, hepatitis, renal problems, liver problems etc, they should not be interviewed.
D. OUTCOME MEASURES:

1. WHODAS 2.0 (WORLD HEALTH ORGANISATION DISABILITY ASSESSMENT SCHEDULE).

Frame 1 - degree of difficulty (increased effort, discomfort or pain, slowness, changes in the way the person does the activity)

Frame 2 - due to health conditions (this is replaced by back pain - remind the patient to only think about his back pain). Possible responses - none to extreme/cannot do. Any problem not due to back pain should not be scored.

Frame 3 - in the past 30 days (recall abilities are most accurate for a period of 1 month)

Frame 4 - averaging good and bad days (there might be variability in the degree of difficulty over 30 days hence participants should give average rating of good and bad days)

Frame 5 - as the respondent usually does the activity (participants should rate the difficulty considering how they usually do the activity eg was it without assistance before but now with assistance? etc). Possible responses range from ‘none’ to ‘extreme or cannot do’ or ‘not applicable’.

Frame 6 - items rated as not applicable (should assess amount of difficulties encountered actually doing the activity NOT activities the person wants to do or can do but DOES NOT ACTUALLY DO). Responses range from ‘none’ to ‘extreme/cannot do’ or ‘not applicable’

WHODAS typographical conventions

- Interviewer instructions: anything written in blue and/or Igbo is meant to be read to the respondent.
- Anything written in bold and italics is an interviewer instruction and should not be read aloud
- Underlined words key words/phrases that must be emphasized to the participant
- Verbatim entries: A blank line is provided when the interviewer is to record participant’s answer e.g. others (specify)
- Parentheses - should be read out to participants and square brackets contain instructions to translators
WHODAS flash cards

- Two flash cards
- Flashcards #1 and #2 visible to respondent at all times during the interview
- Flashcard #1 - first to be used in the interview - explains the health condition under consideration - in this case back pain. Also reminds respondent that time frame for evaluation is the past 30 days.
- Flashcard #2 - second card to be used in the interview. Provides the response scale for most questions. Read aloud the number and corresponding word. Respondent either points to their answer on the scale or provide responses verbally (later preferred)
- Interviewer instructions tell you when to point flash cards to the respondent

WHODAS: Asking the Questions

- Read questions to respondents exactly as they appear in the questionnaire except in:
  - Grammatical correction e.g. plural to singular - difficulties to difficulty when applicable
  - Verifying responses - if necessary modify the form of word used in the rating scale to make better sense e.g. how much have you been emotionally affected ...none should be replaced by not at all
- Read the entire question and make sure respondent had heard entire question to ensure all concepts in the question is being considered. DO NOT accept a premature response
- Use flashcards where instructed
- Do not skip any questions or bias responses by making assumptions - ‘I know this might not apply to you…’

Question-by-question specifications (from WHODAS 2.0 Manual)

- Each section from WHODAS 2.0 is listed alphabetically, based on the letter that precedes the question number. In this handout, questions are shown in bold text, notes on what to record or why are given in plain text.

Demographic/Background Questions

- Provides background information about what is intended by each question in WHODAS 2.0.
- Especially important when participants request clarification of specific questions. They should NOT offer their own interpretations.
- A1- sex
- A2- age
- A3- education
- A4-current marital status
- A5- main work status
Section 1: Face sheet: Questions F1–F5

Questions F1–F7 are intended to gather demographic information about each respondent, and should be completed by the interviewer before the start of an interview.

F1 Record respondent or subject identification number.

F2 Record interviewer identification number.

F3 Record the assessment time point (time 1, time 2, etc.).

F4 Record the interview date in the format day/month/year, filling in blanks with zeros. For example, May 1st 2009 would be recorded as 01/05/09, not as 05/01/09.

F5 Indicate the respondent’s living situation at the time of the interview.

• 1 = Independent in community (i.e. living alone, with family, or friends in the community).

• 2 = Assisted living (i.e. living in the community but receiving regular, professional assistance with at least some daily activities, such as shopping, bathing and meal preparation).

• 3 = Hospitalized (i.e. residing in a 24-hour supervised setting such as a nursing home, hospital or rehabilitation facility).

Section 2: Questions A1–A5: Demographic and background information

This section should be completed with reference to the person completing the interview.

A1 Record sex as observed

A2 How old are you now? - Record age
A3 How many years in all did you spend studying in school, college or university? - If the respondent dropped out of school or university, do not give credit for a partial year. If an individual has been in school both full- and part-time, note the number of years in full time education. Count any repeated grades as two years.

A4 What is your current marital status? - Allow the respondent to answer this question without reading the choices in advance. If the response does not correspond exactly with one of the provided responses, clarify by reading the choices that could correspond with the response. Select the option that best reflects current marital status. For example, if the respondent is currently married but was divorced in the past, score only currently married.

A5 Which describes your main work status best? - Select the option that best reflects the respondent’s current main work status. If doubtful about how to code a respondent (e.g. as homemaker or unemployed), rely on the respondent’s judgement of their work status. There is no minimum number of hours per week that a respondent must work to qualify for the paid work category. Similarly, students need not be full time in order to be classed as such. In some versions, this item is used to determine whether respondents will be asked the series of work questions found in Domain 5. Therefore, if unsure about the response to this item, default to a category that will qualify the person to answer the questions about work in Domain 5. If the respondent reports being unemployed, ask: “is this for health reasons or for other reasons”, and score accordingly.

Section 4: The six domains

Domain 1: Cognition: Questions D1.1–D1.6:

Domain 1 of WHODAS 2.0 asks questions about communication and thinking activities. Specific areas that are assessed include concentrating, remembering, problem solving, learning and communicating.

In the past 30 days, how much difficulty did you have in:

D1.1 Concentrating on doing something for ten minutes?
This question is intended to determine the respondent’s rating of difficulty with concentration for a short period, defined here as 10 minutes. Generally, respondents understand this item. However, if clarification is requested, encourage the respondent to think about their concentration in usual circumstances, rather than when they are preoccupied by a problem or are in an unusually distracting environment. If necessary, prompt the respondent to think about their concentration while they were doing something such as work tasks, reading, writing, drawing, playing a musical instrument, assembling a piece of equipment, and so on.

D1.2 Remembering to do important things?

This is a question about remembering matters of day-to-day importance. It does not refer to remembering irrelevant content or detailed information from the past. Ask respondents how well they remember to do things that are important to them or to their family. If a respondent normally uses some form of memory aid – for example, note-taking, electronic reminder systems or verbal cueing from personal assistants – then rate their performance with this aid taken into consideration.

D1.3 Analysing and finding solutions to problems in day-to-day life?

This item refers to a complex activity involving many mental functions. If respondents are unsure of what the item means, ask them to think about a problem they encountered in the past 30 days. Once a problem is identified, respondents should be asked to consider how well they:

• identified that a problem existed
• broke it down into manageable parts
• developed a list of possible solutions
• determined the pros and cons of each solution
• determined the best solution given all considerations
• executed and evaluated the chosen solution
• selected an alternate solution if the first choice was not successful.

D1.4 **Learning a new task, for example, learning how to get to a new place?**

In this question, learning a new route is offered as an example. If respondents ask for clarification or appear to be thinking only about learning how to get to a new place, encourage them to think of other situations in the past month where learning something new was required, such as:

• a task at work (e.g. a new procedure or assignment)
• school (e.g. a new lesson)
• home (e.g. learning a new home-repair task)
• leisure (e.g. learning a new game or craft).

Ask respondents, when rating themselves, to consider how easily they acquired new information, how much assistance or repetition they needed in order to learn and how well they retained what they learned.

D1.5 **Generally understanding what people say?**

Ask respondents to consider their usual mode of communication (e.g. spoken language, sign language, use of an assistive device such as a hearing aid, etc.) and rate the overall degree of difficulty they have in understanding the messages of others. Respondents should consider all situations they have encountered in the past 30 days, such as:

• when others spoke quickly
• when there was background noise
• when there were distractions.

Difficulties due to different mother tongues should be excluded when rating this question.
D1.6 Starting and maintaining a conversation?

Rate both starting and maintaining a conversation. If respondents state that they have more trouble starting than maintaining a conversation (or vice versa), ask them to average the amount of difficulty experienced with both activities to determine the final difficulty rating. Conversation includes use of whatever is the usual mode of communication (spoken, written, sign language, gestural). If respondents normally use assistive devices for communication, ensure that the difficulty rating provided takes into account conversation while using those devices.

Ask respondents to consider any and all other factors related to their back pain and relevant to them in starting and maintaining a conversation. Examples might include hearing loss, language problems, stuttering and anxiety.

Domain 2: Mobility: Questions: D2.1-2.5

Activities discussed in Domain 2 of WHODAS 2.0 include standing, moving around inside the home, getting out of the home and walking a long distance.

In the past 30 days, how much difficulty did you have in:

D2.1 Standing for long periods such as 30 minutes?

D2.2 Standing up from sitting down?

This question refers to standing up from sitting in a chair, on a bench or a toilet. It does not refer to standing up from sitting on the floor.

D2.3 Moving around inside your home?

This item refers to moving from room to room, and moving within rooms, using assistive devices or personal help that is usually in place. If a respondent lives in a house with multiple floors, this question also includes getting from one floor to another, as needed.

D2.4 Getting out of your home?

This question seeks information about:

• physical (mobility) aspects of getting out of the home
• emotional or mental aspects of leaving the home (e.g. depression, anxiety, etc.)

For this question, “home” means the respondent’s current dwelling, which might be a house, apartment, or nursing home.

**D2.5 Walking a long distance such as a kilometre [or equivalent]?**

**NOTE:** Here use examples to describe one kilometre

Convert distances into imperial measure where necessary (e.g. older people may be more familiar with miles than with kilometres).

**Domain 3: Self-care: Questions: D3.1-3.4**

Domain 3 asks about bathing, dressing, eating and staying alone.

**In the past 30 days, how much difficulty did you have in:**

**D3.1 Washing your whole body?**

This question refers to respondents washing their entire body in whatever manner is usual for their culture.

If respondents report that they have not washed their bodies in the past 30 days, ask whether this is due to a health condition (as defined by WHODAS 2.0). If respondents report that it is due to a health condition, then code the item “5” for “Extreme or cannot do”. If respondents report that the lack of washing is not due to a health condition, then code the item “N/A” for “Not applicable”.

**D3.2 Getting dressed?**

This question includes all aspects of dressing the upper and lower body. Ask respondents to consider activities such as gathering clothing from storage areas (i.e. closet, dressers) and securing buttons, tying knots, etc., when making the rating.
D3.3 Eating?

This item refers to:

• feeding oneself: that is, cutting food, and getting food or drink from a plate or glass to the mouth

• swallowing both food and drink

• mental or emotional factors that may contribute to difficulty in eating, such as anorexia (low food intake), bulimia (excessive eating with subsequent purging), or depression.

This item does not refer to meal preparation.

If a respondent uses non-oral feeding (e.g. tube feedings), this question refers to any difficulties experienced in self-administering the non-oral feeding; for example, setting up and cleaning a feeding pump.

D3.4 Staying by yourself for a few days?

The intent of this question is to determine any difficulty respondents have in staying alone for an extended period and remaining safe. If respondents did not experience this situation in the past 30 days, “N/A” is the correct rating.

If respondents give a rating of “None” for this question, probe the response to determine whether respondents stayed by themselves without difficulty (in which case “1” is correct) or whether they did not stay by themselves at all (in which case “N/A” is correct).

Domain 4: Getting along: Questions: D4.1-4.5

Domain 4 assesses getting along with other people, and difficulties that might be encountered with this due to back pain. In this context, “people” may be those with whom the respondent is intimate or knows well (e.g. spouse or partner, family members or close friends), or those whom the respondent does not know at all (e.g. strangers).

In the past 30 days, how much difficulty did you have in:

D4.1 Dealing with people you do not know?

This item refers to interactions with strangers in any situation, such as:
• shop-keepers
• service personnel
• people from whom one is asking directions.

When making the rating, ask respondents to consider both approaching such individuals, and interacting successfully with them to obtain a desired outcome.

D4.2 Maintaining a friendship?

This item includes:

• staying in touch
• interacting with friends in customary ways
• initiating activities with friends
• participating in activities when invited.

Respondents will sometimes report that they have not engaged in friendship-maintenance activities in the past 30 days. In this case, ask whether this situation is due to back pain (as defined by WHODAS 2.0). If respondents report that it is due to back pain, then code the item “5” for “Extreme or cannot do”. If respondents report that it is not due to back pain, then code the item “N/A”.

D4.3 Getting along with people who are close to you?

Ask respondents to consider any relationships that they define as close. These may be within or outside the family.

D4.4 Making new friends?

This item includes:

• seeking opportunities to meet new people
• following up on invitations to get together
• social and communication actions to make contact and to develop a friendship.
On occasion, participants will report that they have not engaged in friendship-making activities in the past 30 days. In this case, interviewers should ask whether this is due to back pain (as defined by the WHODAS 2.0). If respondents report that it is due to back pain, then code the item “5” for “Extreme or cannot do”. If respondents report that it is not due to back pain, then code the item “N/A”.

D4.5 Sexual activities?

Ask respondents to think about what they consider to be sexual activities when answering this question. If asked for clarification, explain that this question refers to:

- sexual intercourse
- hugging
- kissing
- fondling
- other intimate or sexual acts.

NOTE: Normalise this as our culture inhibits free discussion of this which could bias respondents’ responses.

Domain 5: Life activities: Questions: D5.1-5.8

This domain includes questions about difficulty in day-to-day activities. These activities are those that people do on most days; they include household, work and school activities.

Ensure that flashcards #1 and #2 are visible.

Question-by-question specifications numbers in bold refer to the self-administered versions, and those in brackets refer to the interviewer-administered versions.

Because of your back pain, in the past 30 days, how much difficulty did you have in:

D5.1 Taking care of your household responsibilities?
This global question is intended to elicit respondents’ appraisal of any difficulty they encounter in maintaining the household and in caring for family members or other people they are close to.

Ask respondents to consider all types of household or family needs, including:

- physical needs
- emotional needs
- financial needs
- psychological needs.

In some cultures, males may indicate that they do not have household responsibilities. In this situation, clarify that household responsibilities include:

- managing finances
- car and home repairs
- caring for the outside area of the home
- picking up children from school
- helping with homework
- disciplining children.

Add any other examples that elucidate household responsibilities held by males in the culture, as necessary.

Here, “household” is defined broadly. In the case of participants who do not have a stable dwelling place, there are still activities surrounding the upkeep and maintenance of their belongings. This question refers to those activities.

D5.2 Doing most important household tasks well?

D5.3 Getting all the household work done that you needed to do?
Ask respondents to provide ratings based on their own appraisal of how well household tasks are completed and whether needed household work gets done. If necessary, remind respondents that they are to report only difficulties due to their back pain, not those that may be experienced for other reasons such as not having enough time (unless this reason is somehow linked to their back pain).

D5.4 Getting your household work done as quickly as needed?

This question refers to the timely meeting of expectations and needs of those respondents whom one lives with (or is close to), in relation to household tasks and responsibilities.

D5.5 Your day-to-day work/school?

This global question is intended to elicit respondents’ appraisal of difficulties encountered in day-to-day work or school activities. This includes issues such as attending on time, responding to supervision, supervising others, planning and organizing, meeting expectations in the workplace and any other relevant activities.

D5.6 Doing your most important work/school tasks well?

Doing work or school tasks “well” refers to completing them as expected by a supervisor or teacher, by respondents’ own standards or as specified in the performance criteria for a job or school.

D5.7 Getting all the work done that you need to do?

D5.8 Getting your work done as quickly as needed?

These questions refer to meeting work quantity expectations and time deadlines.
Domain 6: Participation: Questions: D6.1-6.8

Domain 6 represents a shift from the line of questioning used in the first five domains. In this domain, respondents are asked to consider how other people and the world around them make it difficult for them to take part in society. Here, they are reporting not on their activity limitations but rather on the restrictions they experience from people, laws and other features of the world in which they find themselves. The underlined phrases in the introduction must be emphasized to help respondents shift their mindset and understand what is being asked. Respondents need to understand that the focus of these questions is on problems encountered because of the society in which they live rather than because of their own difficulties. This domain also includes questions about the impact of the back pain.

The introduction to this domain specifically reminds respondents that the focus of this interview is on the past 30 days. However, this particular domain does not readily lend itself to such a limited time frame; therefore, it is important to ask respondents to attempt to remain focused on the 30-day reference period.

In the past 30 days:

D6.1 How much of a problem did you have **joining in community activities** (for example, festivities, religious or other activities) in the same way anyone else can?

If necessary, clarify this question using other examples of community activities, such as attending town meetings, fairs, leisure or sporting activities in the town, neighbourhood or community. The relevant issue being asked in this question is whether respondents can participate in these activities or whether there are inhibitors to them doing so.

If respondents appear confused by the phrase “in the same way anyone else can”, ask them to use their judgement to:

- assess the extent to which average people in their community can join community activities; and

- consider their personal level of difficulty in joining community activities in relation to the assessment.
D6.2 How much of a problem did you have because of barriers or hindrances in the world around you?

The intent of this question is to determine how much has stood in the way of respondents being able to realize aspirations and plans as other people can. The concept here is what respondents face in terms of external interference created by the world or other people. Barriers could be:

- physical – for example, the lack of ramps to get into church; and
- social – for example, laws that discriminate against people with disabilities and negative attitudes of other people that create barriers.

D6.3 How much of a problem did you have living with dignity because of the attitudes and actions of others?

Ask respondents to consider problems they have had in living with dignity or pride in who they are, what they are doing and how they live their lives.

D6.4 How much time did you spend on your back pain, or its consequences?

This question seeks to capture an overall rating or snapshot of the portion of the past 30 days spent by respondents in dealing with any aspect of their back pain. This may include time spent in activities such as:

- visiting a treatment centre;
- managing financial matters related to their health condition, such as payment of bills, reimbursement of insurance or benefits; and
- obtaining information about the back pain or in educating others about it.

D6.5 How much have you been emotionally affected by your health condition?

This question refers to the degree to which respondents have felt an emotional impact due to their health condition. Emotions may include anger, sorrow, regret, thankfulness, appreciation, or any other positive or negative emotions.
D6.6 How much has your health been a drain on the financial resources of you or your family?

Family is broadly defined to include relatives; however, it also includes those to whom respondents are not related but consider to be like family, including those who may be sharing in the financial aspects of the back pain. The focus of this question is on the depletion of personal savings or current income to meet the needs created by the back pain. If respondents have experienced a significant financial drain but their family has not, or vice versa, they should respond to the question based on the drain experienced by either party.

D6.7 How much of a problem did your family have because of your back pain?

The focus here is on problems created by the interaction of a respondent’s back pain with the world in which the person lives. The question seeks information on problems that are borne by the family; these might include financial, emotional, physical problems, etc. The term “family” is defined above in D6.6.

D6.8 How much of a problem did you have in doing things by yourself for relaxation or pleasure?

Ask respondents to consider leisure interests that they currently pursue and those they would like to pursue but cannot due to their back pain and restrictions imposed by society.

Provide an overall rating of problems encountered.

Questions H1–H3: Effect of difficulties

Questions H1–H3 assess the extent to which the various difficulties respondents have encountered have affected their lives.

H1 Overall, in the past 30 days, how many days were these difficulties present?

This is a global rating concerning all the difficulties assessed in the interview.
H2 In the past 30 days, for how many days were you **totally unable** to carry out your usual activities or work because of your back pain?

Encourage respondents to use their own definitions of “totally unable” in answering this question.

H3 In the past 30 days, not counting the days that you were totally unable, for how many days did you **cut back or reduce** your usual activities or work because of any health condition?

Ask respondents to consider any sort of reduction in usual activities, rather than counting only the days that they were totally unable to carry out activities.

**Problems and solutions-WHODAS**

- ‘I am having difficulty knowing when to code ‘not applicable and when to code ‘cannot do’
- WHODAS 2.0 seeks to determine the amount of difficulty encountered in activities that respondents actually do
- if a respondent is prevented from doing the activity due to back pain, rate the item as ‘5’ for ‘extreme or cannot do’
- If a respondent has not experienced an activity in the past 30 days, but NOT due to back pain, code the item as ‘N/A’ for ‘not applicable’

- Respondent gives an answer that does not correspond with ‘my/others’ understanding of respondent’s current functioning
- WHODAS measures responses from the perspective of the respondent.
- Although an interviewer must not always agree with the respondent’s answer, the answer given by respondent must be the one recorded
- This may be frustrating but must be followed to ensure consistency in administration

- Respondent does not give a clearly codable answer
- Probe the respondent for further clarification as was discussed
- Respondent becomes annoyed by repetitious questions—might think interviewer was not listening
- 2 options:
  - Ask the questions with a preface—read the question with a preface that acknowledges previous responses, e.g.
    ‘you told me before that..., but I still need to ask you this question as it is written’
Confirm the response—that is, reword the question in a way that confirms the information that the respondent already gave, e.g. ‘you told me before that..., is that correct?’

**Common probing situations: WHODAS e.g.**

- Don’t know—when respondents say this-repeat the question, if this is unsuccessful, probe respondent using previous examples, if still unsuccessful after several attempts then record ‘DK’ in the left margin of the measure.
- Not applicable—respondents may sometimes feel that a question is not applicable to them e.g. D4.5 on sexual activities for those that are not sexually active (other e.g.s might exist), in this case record N/A in the left margin.
- Normalise sexual activities and any potentially sensitive question as the influence of our culture might bias respondents’ answers.

**Question by Question specifications of other Measures**

2. **ROLAND MORRIS DISABILITY QUESTIONNAIRE (RMDQ)**
   This measures the respondents’ disability ‘**TODAY**’, that is on the day of interview as opposed to WHODAS that is PAST 30 DAYS.
   - Emphasize this throughout the period you are using this measure!
   - Do not sum up scores
   - If a respondent indicates an item applies to them **ON THAT DAY/TODAY** then the **item number** is circled.

   The RMDQ is scored by marking the items chosen by the patient. It is **NOT** recommended to give patients a ‘Yes’ / ‘No’ option. If patients indicate in any way that an item is not applicable to them, you should then score the item ‘No’ on the right hand side but if the patient indicates the item applies to them **ON THAT DAY** then the **item number** is checked/circled. Do not add up scores-leave that for the research team.

3. **11-point box scale**

   **Tell respondents to rate their pain **TODAY****

   Show the Likert scale to respondents like a flash card to explain varying levels of pain. Ask the respondent to describe his/her pain using the diagram to show him/her increasing pain as one moves towards 10. Let the respondent mention or point at a number to describe their pain.
Start by giving the 6 time points (start, middle and end values) and the meaning of these.

Do not say anything that is not written on this scale. If a respondent asks a question that is not included in the measure, repeat the question and tell the respondent to choose one option based on what he/she understood from the question.

4. HADS:
   This is a measure of anxiety and depression. Read out instruction to the respondent carefully before starting the interview and circle options chosen by the respondents.

   Interview respondents starting from the left to the right, to the left to the right and continue this way until all questions have been asked.

   When a respondent chooses an option that is between 2 options, repeat both options again for the patient to decide on a specific answer. This principle can be applied for other measures.

5. Pain Coping strategies questionnaire (CSQ)
   A measure to understand how people coped with their back pain. Again read out instructions exactly as they appear and do not offer your own explanations. Write the score chosen by the respondent by the right side of each item. Try to be consistent for all respondents. Show the likert scales like flashcards to respondents as you are interviewing them to enable them choose their correct option. Note that there are 3 different likert scales which must be used at the different sections as they are indicated in this measure.

   Start by giving them the 3 anchors and what they mean. Then narrow down to specifics by comparing other scores with the three main anchors. Repeat likert scales with explanations for each question.

   For the second and third likert scales, read out only the first sentence. Then explain the scales using the three main anchors to explain other scores just like you did for the first likert scale but using the words specified here.

6. Multidimensional Scale of Perceived Social Support (MSPSS)
   This is a self-report measure of subjectively assessed social support. Remember to show the Likert scales to the respondent as you are asking the question and repeat all options for every question. Say only what each number means excluding ‘circle each...’ since this is interviewer-administered to conserve time.
7. Occupational risk factor questionnaire (ORFQ)
Follow instructions exactly as they are.

Encourage respondents to describe their main occupational duties. Please note the
difference between job and duties. Let respondent start by naming the job then describe
the activities that the respondent does in the job MOST TIMES. This activity description
is very important e.g. carpenter- lifts wood onto a desk, uses saw to cut them, lifts them
into the vehicle, lifts them out of the vehicle and unto working desk, bends down to cut,
and hits them in place...etc.

Use the pictures in the original ORFQ to describe activities to participants. You can also
demonstrate to the patient using the pictures in the English version of the questionnaire.
Take pictures of respondents’ work activities if possible.

Begin with the 3 time points: almost never, half the time, almost all the time, then when
respondent gives an option that is between the 3 main time points, then describe what
these mean by reading them out as they are on the measure.

8. Brief illness perception Questionnaire (BIPQ)
Assesses the cognitive and emotional representations of illness. In this study the illness
is BACK PAIN. Use likert scales like flashcards by showing the respondent the scales while
interviewing them. Give full explanation for each question by repeating what 0 and 10
stand for. Circle the chosen answer.
For item 9, the respondent should tell you the 3 things he/she feels caused their back
pain. They should start with the most important (1) to the least important (3). For Que. 5-
use malaria as an example to enhance understanding of ‘mgbaama’ (symptoms).

9. Fear avoidance beliefs Questionnaire (FABQ)
This measures how fear and avoidance affects a respondent with back pain. It assesses
fear and avoidance related to physical activity and work related activities.
Follow instructions carefully and allow respondents to make their own interpretations.

Record the correct number by the side of each question. Remember to show the
respondents the Likert scales to enable them choose their options correctly. Only one
option for each item.

Use the three anchors first, then explain the numbers in between these anchors
comparing them to the anchors. Repeat this for each question.

10. BACK PERFORMANCE SCALE (BPS)
This is an objective back specific performance measure of mobility-related activities
(back specific functional assessment). All the other measures in this study are self-
reported
Follow the instructions exactly as they appear on the document. Demonstrate movements as you instruct participants to perform them. Also show Patients the pictures demonstrating the movements in the original measure. Ensure they are relaxed.

Have these for this assessment:
1. A tape measure
2. A box of 1.35 kg sized 0.36 x 0.36 x 0.25cm containing a sandbag of 5kg

**Problems and solutions-other measures**
- RMDQ: TODAY must be emphasized
- ORFQ: Concretize weights, distances, %ages etc. Also note work activities NOT ONLY work
- All measures with Likert scales must be used as flash cards-show the scales respondents whilst administering the measure
- BPS: Only objective measure. Respondents will not generate the scores YOU WILL!

**LABELLING MEASURES**
- Different codes for the first 50 respondents from the chosen villages.
- First study coding: research assistants initials/patients initials/ (a) or (b). a is data collected the first time. (b) is data collected the second time.
- Second study coding: research assistants initials/patients initials/respondents’ number
- Names, contact details, and respondents’ unique codes MUST be written on the signed consent forms to enable identification and verification of data
- Different research assistant codes for the first 50 respondents and respondents from the chosen villages
- Names, contact details, and respondents’ unique codes MUST be written on the signed consent forms to enable identification and verification of data
Determinants of functioning in non-specific chronic low back pain patients in rural Nigeria

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Can I know you?

Names

Research/clinical experience

Phone numbers
Content of training/field work

1. What is research?
2. Multistage cluster sampling
3. Survey research
4. Interviewing skills
5. Confidentiality
6. Practical administration of original outcome measures
7. Administration of adapted measures
8. Individual practice sessions with patients
9. Field work in the rural communities
10. Conclusion of data collection/certificate presentation

Objectives for first day of training

- Meaning of research
- Selection of sample
- Practice session–visit to traditional heads
Research

-systematic investigation into/study of materials and sources in order to establish facts and reach new conclusions.

‘s systematic’—done or acting according to a fixed plan or system; methodical

Multistage cluster sampling

› Enugu State—urban and rural—rural chosen

› 14 rural LGAs—10 randomly chosen by computer

› 10 rural LGAs composed of different wards

› 1 ward randomly selected by computer from each LGA
Multistage cluster sampling contd

- 10 wards representing 14 rural LGAs of Enugu State
- Wards composed of different villages
- 1 village randomly selected from each ward
- 10 villages representing 14 rural LGAs of Enugu State.

Selection of 1 CHW for each of the 10 villages

- Simple random sampling without replacement

- Practice Session: Visit of each CHW to the trad ruler of one village out of the 10 villages—give information sheet, study advert and obtain signed permission, facilitate village announcements
- 2 advert fliers given to trad ruler—he keeps one, you return signed one.

- Collect contact details including phone numbers of traditional heads
Report on communication with traditional rulers/village announcements

- Called traditional heads?
- Village announcements made?

Objectives for second day of training

- Understanding survey research
- Good interviewing skills
- Confidentiality in research
- Review/Practical administration of screening/measures
- Clarifying and probing responses
- Recording data
  - Practice sessions/fidelity checks
Background to survey research

- What is a survey?
  - Collection of data from a sample of defined elements in order to derive estimates relating to all/population of such elements

- 2 main types: cross-sectional survey and longitudinal survey
  - Cross-sectional survey: data collected at a single point in time from respondents—this study
  - Longitudinal survey: data collected over a period of time to look for changes in the population

Lifecycle of a survey

1. Construct information you seek
2. Measurement i.e. ways to gather the information e.g. questions
3. Response
4. Edited response
5. Survey data
6. Defining target population
7. Finding sampling frame
8. Drawing sample
9. Collecting data from respondents
10. Making post-survey adjustments
What can go wrong in survey research?

- Construct information you seek
  - Measurement: ways to gather the information e.g. questions
  - Response
  - Edited response
- Defining target population
  - Coverage error
  - Finding sampling frame
  - Sampling error
  - Drawing sample
  - Non-response error
  - Collecting data from respondents
  - Adjustment error
- Making post-survey adjustments

What can you do wrongly in this survey?

- You can introduce these:
  - Measurement error
    - Response bias—bias in how questions are answered
  - Processing error
  - Sampling error
  - Non-response error: unit and item non-response
    - Non-response bias—bias in who answers the questions and the questions answered
    - FIELD WORK—NOTE the number of people you recruited and the number you couldn’t: refused, unavailable, no CLBP

- This training is to avoid the introduction of these completely/keep them at the barest minimum!
Good Interviewing skills

› Make a good introduction to the interview including goals of the interview
› Different participants might require different levels of information about the study hence your introductions adjusted accordingly
› Be serious, pleasant and self-confident
› Nervousness makes participants uneasy
› Speak slowly and clearly to set the tone for interview
› Give breaks when respondents get tired and continue after some minutes
› Appear interested in the research

Good Interviewing skills contd

› In your introduction include your name and professional affiliation and:

› The organisation you represent: UNN and KCL

› That the research will help us develop an intervention for back pain
› That the participants’ involvement is vital to the success of the research
› That there are no right or wrong answers
› That responses will be kept confidential
Good Interviewing skills contd

- Provide feedback as necessary by using neutral phrases in reaction to participant’s behaviour through out the interview to avoid biasing responses
- Be neutral through out interview, not reacting by gesture or word, either positively or negatively to any responses
- Ensure that accurate/sensitive information are obtained by interviewing the participant alone
- Reinforce focused attentive behaviour and discourage digression, distraction and inappropriate enquiries
- Do not change wording/sequence of questions

Good Interviewing skills contd

- Ask questions directly and consistently of all respondents
- Do not create false expectations
- If respondents make inappropriate enquiries use one of these phrases:
  - In this interview, we are really interested in learning about your experiences
  - When we finish, let's talk about that
  - We will come to that later
- At the end of the interview, thank respondents and assure them that their contribution was valuable
Good Interviewing skills contd

- If respondents digress from the questions by giving too much information, use of these phrases:
  - I have many more questions to ask, so we should move on to those now
  - If you would like to talk more about that, we can do that at the end of the interview
- These 2 sentences are very effective when used together
- Silence can also be effective

CONFIDENTIALITY

- Interviews must be kept confidential
- There must be no disclosure to any other party outside of the study team
- This must be emphasized to the respondent before you start interviewing
CONFIDENTIALITY

- Interviews must be kept confidential

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- This must be emphasized to the respondent before you start interviewing

Practical aspects…contd

- In this study, interviewers have to be friendly to ensure accurate answers are obtained

- Ensure all items are completed—AVOID MISSING ITEMS/QUESTIONS

- In the rural areas—when patients do not understand a particular Igbo item, after repeatedly reading it, then read out the same item in the English version of the questionnaire. DO NOT TRANSLATE TO ENGLISH BY YOURSELF OR OFFER YOUR OWN EXPLANATION

- For objective assessment, follow instructions as they are and ensure that the patient is in a relaxed position
Clarifying unclear responses

- Clarification needed when respondent is unable to answer a question due to inability to understand part or all of the question

- Probing required when respondent appears to understand question but gives a response that does not meet the objective of the question

- When this happens, use non-directive probing or repeat the questions

Rules for clarification and probing

- If you doubt that respondents heard the entire question, repeat it—e.g., if respondents answer irrelevantly or do not seem to understand all aspects of the question, reread either the whole question, or the portion that was not understood

- When respondents ask about a specific part of the question, repeat only that part

- When respondents ask you to repeat one response option, repeat all response options, only omitting a response option if respondents have clearly eliminated that option
Rules for clarification and probing contd

› Use only the question text or neutral probes to avoid introducing bias into the question
› In repeating a question, use neutral introductions like
  ❖ overall...
  ❖ Let me repeat the question...
  ❖ Well, in general...
  ❖ Generally speaking...
› If respondents ask for clarification, first repeat question. If still unclear, then use question by question specifications for the measures, do NOT use any other explanation

Rules for clarification and probing contd

› If respondents request a definition/explanation that is not in the question by question specifications, instruct them to answer the question using their own definition/interpretation e.g.
  ❖ Whatever ...means to you
  ❖ Whatever you think of as ...

› If you suspect a respondent has given you an unlikely answer, probe by asking the respondent to explain their answer. If it is clear there was lack of understanding then repeat the question following relevant principles.
Types of probes

› Use only neutral probes to help respondents provide descriptions when necessary or to arrive at a single response

› Questions with rating scale should have only one answer circled. E.g.
  ✤ Can you tell me what you mean by that?
  ✤ Can you tell me more about that?
  ✤ What do you think?
  ✤ Which would be closer—slight or moderate?
  ✤ Can you think of any others?

Types of probes contd

✤ What is your best estimate?

✤ Can you be more specific?

✤ Can you give me your best guess?

✤ Can you provide one overall rating?
Recording data

› Do not use red ink/pencil—use blue pen

› For closed questions, write answers in the space provided to correspond only to the particular question

› Most questions require that an answer be circled, make sure that the circle encloses only one number

› For measures that require just marking the answers that are true for the respondent, circle clearly and only the item numbers that apply to the respondent

Recording data contd:

› If an incorrect answer is circled because respondents change their mind or you make a mistake, put a slash (/) through the incorrect answer and circle the correct answer or write it in above

› Some answers require entry of a number, in this case ‘right-justify’ the answers. E.g. WHODAS:

❖ A3—how many years in all did you spend studying in school, college or university?, if the response is ‘nine years’ then write/record ’09 years’
Recording data contd

- If you get a qualified response to closed questions—respondents give codable response but temper their answer with conditional descriptions: ‘if’, ‘except’, ‘but’. Code such answers but record the qualifications in the left margin of the form.

- Continue to follow the skipping pattern—sometimes respondents might explain their responses rather than qualify them signaled by words ‘because’, ‘when’, or use a synonym for the response. Do not record such respondent comments in the margins.

Recording data contd

- If uncertain about a respondent’s answer, repeat the question and record the answer exactly. When in doubt, do not paraphrase a response.

- If clear about a response but unsure how to code it, record enough information in the left margin to allow the research team to make a decision.

- Also use a question mark (?) in the left margin to indicate the uncertainty to the research team.
Recording data contd

- Missing data MUST BE AVOIDED AT ALL COSTS!

- If a question is accidentally missed during the interview, enter ‘missed’ in the left margin of the form

- If a missed question is noticed during an interview, go back and ask the question, making a note in the left margin that the question was asked out of sequence

- If a missed question is discovered after the interview, make every effort to recontact the respondent

Recording data contd

- REFUSAL TO ANSWER
  - Always record refusals to answer questions by writing ‘REFUSED (RF)’ in the left margin

- SKIPPED QUESTIONS—questions skipped due to the skip rules should be left blank

- POST–INTERVIEW EDITING—sometimes it might be necessary to compromise data recording to maintain the flow of interaction—hence edit recorded data after interview (reduces missing data)
Recording data contd

- POST-INTERVIEW EDITING contd: when?
  - Shortly after finishing each interview and before starting the next, check that all questions were completely legibly answered. Do this while respondent is present to help in correcting any omissions.

- During post-editing, enter 'MISSED' in the left margin next to any question unintentionally missed during the interview (AVOID THIS!)

- DO NOT SUM SCORES—only mark individual items

- Turn completed interviews to research team (me) promptly so that any errors are noted/corrected before further interviews are conducted.

Review of the original measures

- Screening and 10 outcome measures
  1. WHODAS
  2. RMDQ
  3. 11-point box scale
  4. HADS
  5. CSQ
  6. MSPSS
  7. BIPQ
  8. FABQ
  9. ORFQ
  10. BPS
Screening

- VERY IMPORTANT

- Can invalidate entire study!

- Practical demonstration of yes and no answers for each question, how to probe further and what yes and no responses would mean for each question.

WHODAS 2.0

- A measure of function and disability
WHODAS contd

- 6 frames of reference for the respondents

Question by question specification of the WHODAS

- 6 Domains of the WHODAS

- Domain 1: Cognition; D1.1–D1.6
- Domain 2: Mobility; D2.1–D2.5
- Domain 3: self-care; D3.1–D3.4
- Domain 4: Getting along with people; D4.1–D4.5
- Domain 5: Life activities–5(1) Household activities; D5.1–D5.4, 5.01 and 5(2) Work or school activities D5.5–D5.10, 5.02
- Domain 6: participation D6.1–D6.8
Question by Question specification of other Measures

- NOTE: For all measures, read instructions carefully before starting

- Read questions exactly as they appear on the questionnaire. DO NOT offer your own explanations. Ask the patient to answer from his own understanding
- Refer to hand out (word document)

Objective assessment using the back performance scale (BPS)

- Practical demonstration of measure

- Group demonstration
Review of the adapted measures

› Practice reading out the Igbo measures as they should be read out applying the principles already described for the original measures

Practical sessions/role play/coding and assessment

› CHWs conduct interviews on one another as they would do in the field and record on the questionnaires

› Research assistant/patient coding of outcome measures

› Use adapted measures for this

› Assessment and scoring of these
Fidelity checks for psychometric testing

- Collect contact details of the 50 participants (5 each)
- Phone numbers very essential
- Research assistants’ unique codes for this group different from the codes to be used for subsequent data collection from the villages
- Practice Session: Go to the field and collect data from 50 patients with back pain. Ensure these people are close to you/happy to be interviewed again

Post-training assessment

- Assessment
- Scoring
- Discussion
Report application on 50 chronic back pain patients

- Submit completed measures
- Assessment of these
- Discussion

Objectives for third day of training

- Sampling conclusion–households/individuals
- Practical aspects of field work
- Fidelity checks
- Reports
Multistage cluster sampling contd

- 10 geographical maps for the 10 villages
- Individuals that came after the village announcements
- Screening
  - Stratification by gender
- Random selection of individuals

Multistage cluster sampling contd

- EQUAL number of males and females for each CHW
- 10 males 10 females
In the field

› CALL ME ANYTIME (DURING/AFTER INTERVIEW) for clarification

› If possible:
  ❖ Pictures – work posture and any other unique finding
  ❖ Camera/ memory card

Fidelity checks for study 2 data collection

› Contact details of every interviewed respondent

› Do not write names on questionnaires but on consent forms, write only the respondent’s unique code composed of research assistant’s unique code followed by slash (/) followed by the respondent’s code (numerical e.g. 1 to 26 for each CHW)

› Different for both sets of data
Report on first day of data collection/village announcements

- Assessments
- Discussion

Reports on subsequent days of data collection

- Discussion

- Assessments
End of data collection, Discussion and Certificate presentation

- Questions?
APPENDIX 19: POST TRAINING ASSESSMENT OF COMMUNITY HEALTH WORKERS

a. What is research?
b. What is a population based cross-sectional survey?
c. What are the common survey errors and how would you prevent them?

2. WHODAS 2.0

1. A respondent has not walked one kilometre in the past 30 days, this item would be coded as:
   _ a. “Extreme or cannot do”
   _ b. “Not applicable”

2. A respondent is unable to wash her body on her own. However, she usually has the help of a personal assistant, and has no difficulty washing her body with this assistance. The difficulty of this activity would be coded as:
   _ a. “Extreme or cannot do”
   _ b. “None”

3. In interviewer-administered versions of the WHODAS 2.0, anything written in standard print is meant to be read to the respondent.
   _ a. True
   _ b. False

4. The interviewer must read aloud each example contained in parentheses to illustrate the point.
   _ a. True
   _ b. False

5. A respondent can either point to his answer on a flashcard, or may provide responses verbally.
   _ a. True
   _ b. False

6. If a respondent interrupts the interviewer before hearing the whole question, the interviewer must repeat the question from the beginning.
   _ a. True
   _ b. False

7. If a respondent asks about a specific part of a question, the entire question should be repeated.
   _ a. True
8. If a respondent gives a response of “I don’t know”, and a probing question does not elicit another response, the interviewer should then record the original answer.
   _ a. True
   _ b. False

9. Interviewers can use open-ended probing to resolve perceived discrepancies in a respondent’s answers.
   _ a. True
   _ b. False

10. If a respondent gives an answer that does not correspond with the interviewer’s understanding of the respondent’s current functioning, the answer recorded should be:
    _ a. The respondent’s version
    _ b. The interviewer’s version

11. Deleted because not relevant for present study

12. Deleted because not relevant for present study

13. Standardization means that you administer the interview using the same procedures every time.
    _ a. True
    _ b. False

14. Deleted because not relevant for present study

15. Respondents should answer questions taking into account the degree of difficulty they experience ______ the use of assistive devices or personal assistants.
    _ a. with
    _ b. without

16. Respondents should answer questions taking into account the worst day(s) they have experienced in the past 30 days.
    _ a. True
    _ b. False

17. A respondent answers that she has not attempted to learn new tasks in the past 30 days. Upon probing by the interviewer, she clarifies that this is not due to a health condition. This response should be rated:
    _ a. Not applicable
    _ b. Extreme or cannot do
18. The date is to be written in the European format of day/month/year.
   _ a. True
   _ b. False

19. When making your introduction, be sure to state (check two):
   _ a. The purpose of the evaluation
   _ b. That information will be kept confidential
   _ c. The similar types of problems you have experienced in your own life

20. As a general rule, it is a good idea to speak more rapidly than usual so you can finish
    the interview as quickly as possible.
   _ a. True
   _ b. False

21. When respondents provide more information than seems necessary:
   _ a. Make a careful note of the comments in the margin
   _ b. Tell the participant that you have many more questions to ask

22. In WHODAS 2.0, anything written in standard print is meant to be read to the respondent.
   _ a. True
   _ b. False

23. Text written in parentheses should be read only if respondents request clarification.
   _ a. True
   _ b. False

24. Text underlined should be emphasized to respondents.
   _ a. True
   _ b. False

25. It is important to introduce both flashcards at the beginning of the interview.
   _ a. True
   _ b. False

26. Once the flashcards are introduced, they should remain visible to the respondent
    throughout the interview.
   _ a. True
   _ b. False

27. In general, questions should be read to respondents exactly as they appear in the questionnaire.
   _ a. True
   _ b. False

28. If a respondent answers before you have read the entire question, you should:
   _ a. Accept the answer
b. Read the remainder of the question
c. Re-read the entire question

29. You should use the lead-in phrase “how much difficulty did you have in …”
a. Before every question linked to this phrase
b. More or less frequently to make the line of questioning flow smoothly

30. Probing is used when the respondent appears to understand the question, but does not provide a response that meets the objective of the question.
a. True
b. False

31. The interviewer must repeat all response options, even if the respondent asks the interviewer to just repeat one response option.
a. True
b. False

32. Neutral probes should be used rather than repeating the question text.
a. True
b. False

33. Interviewers can use the following to record data (check all that apply):
a. Blue pen or pencil
b. Red pen or pencil
c. Black pen
d. Green pen
e. Pencil

34. When filling in blanks, answers should be “left-justified”.
a. True
b. False

35. When a respondent clarifies a response with “because” or “when”, the interviewer must record these answers in the margin.
a. True
b. False

36. As soon as an interviewer realizes that a question has been skipped, the interviewer must ask the missed question, and make a note in the margin stating that the question was asked out of sequence.
a. True
b False
3. **BACK PERFORMANCE SCALE**

37. How will you standardise the object that the patient will carry for this test?
   a. Verbally tell the patient the dimensions of the object
   b. Measure the weight with a weighing scale and the dimensions with a tape measure before the assessment

38. Which other measurements need to be done for this test
   a. Table height, distance between feet, distance between fingertip and floor
   b. Bed size, table height, distance between feet, distance between tip of fingers and floor

39. After the scoring, you will sum the total scores
   a. True
   b. False

4. **ROLAND MORRIS DISABILITY QUESTIONNAIRE**

40. Circle only the item numbers reflecting how patients feel but do not mark the items which are not true for the respondent.
   a. False
   b. True

41. The major point to note for this scale is that it reflects how patients feel on that DAY different from the WHODAS which reflects how patients felt in the past 30 days
   a. True
   b. False

5. **11-POINT BOX SCALE**

42. This scale must be assessed using the Likert scale like a flash card which means that the respondent is shown the scale while explanation about it is ongoing to enable him verbally choose his answer or point at the answer
   a. True
   b. False

6. **HOSPITAL ANXIETY AND DEPRESSION SCALE (HADS)**

43. Which of these is correct about your administration of the HADS
   a. You administer it starting from the right to the left then down left and then to the right until all items are covered
   b. You administer it from the left to the right, to the left to the right until all items are covered

44. Items not understood by the patient, use your own words to explain it to the patient
   a. True
   b. False
7. COPING STRATEGIES QUESTIONNAIRE
45. There is one Likert scale for all sections in the questionnaire
   a. True
   b. False
46. Different Likert scales exist for the different sections
   a. False
   b. True
47. Use the Likert scales like flashcards which is shown to respondents during the interview
   a. True
   b. False

8. MULTIDIMENSIONAL SCALE OF PERCEIVED SOCIAL SUPPORT (MSPSS)
48. Which of these is true about MSPSS?
   a. There are 7 options which must be explained and repeated for each question
   b. There are 7 options which must be explained only once and then applied for all the questions

9. OCCUPATIONAL RISK FACTOR QUESTIONNAIRE (ORFQ)
49. Which of these is true for ORFQ?
   a. Work related activities as well overall job must be noted, pictures of related activities must be shown to respondents during interviewing, weights must be concretised using culturally identifiable weights, time must also be explained using days of the week as well as percentages
   b. Some of the above are false. Please specify __________________________

10. BRIEF ILLNESS PERCEPTION QUESTIONNAIRE
50. The BIPQ has different Likert scales for each of the questions, each one of these must be explained and shown like a flash card to the respondent. This must be repeated for all items in this questionnaire
   a. False
   b. True
51. Which one of these is true?
   a. The last question is open ended and the respondent must start with the least important answer which the research assistant must record first.
   b. The last question is open ended and the respondent must start with the most important answer which the research assistant must record first.

11. FEAR AVOIDANCE BELIEFS QUESTIONNAIRE
52. Though there is only one Likert scale for this measure, the explanation for this must be repeated for every item and shown like a flashcard to the respondent
   a. False
   b. True
53. The correct answer which is a number must be written on the right hand side of each item
   a. True
   b. False
Screening

54. Which of these is true about the screening questions

The screening shows if a respondent is eligible to be interviewed or not and therefore must be done at the end of the interview

a. True
b. false
APPENDIX 20: FINAL IGBO MEASURES

SCREENING: RED FLAGS

Have you had back pain continuously/on and off for 3 months or more?
  b. I nweela ukwu mgbu a akwusighi akwusi ma o bu nke na ebido na akwusi,
     bido akwusi kemgbe onwa ato ma o bu karia?

Is your back pain present whether or not you are working but gets worse while/just
after working and reduces when you are not working, yet the pain never completely
disappears?
  b. Ukwu mgbu gi o na adigide ma i na aru oru ma o bu inaghi aru oru, kama
     o na aka njo mgbe i na aru oru ma o bu ozugbo i ruchara oru, belata mgbe
     i naghi aru oru, mana ukwu mgbu a anaghi akwusicha kpam kpam?

Do you have paralysis of any part of your body?
  b. I nwere ahu mkponwu ebe o bula na ahu gi?

Do you have difficulty controlling your urine or faeces?
  b. I na anu nsi ma o bu ma mmamiri na ahu gi?

Do you lack sensation anywhere in your body?
  b. o nwere ebe o bula na ahu gi i naghi ama ma mmadu metu ebe ahu aka?

Have you had fever or any illness or been admitted in the hospital recently?
  b. I ria go ahu ma o bu rahu na ulo ogwu mgbe eteghi aka?

Have you had a fall or any accident recently?
  b. I dara ada ma o bu nwee ihe mberede oge eteghi aka?

Have you lost weight recently?
  b. I tara ahu oge eteghi aka?

Are you 70 years or above?
  b. Idi aho iri asaa ma o bu karia?

Have you ever had cancer?
  b. I nweela kansa (cancer) mbu?

Have you been on drugs or are you currently on any drugs? For what?
  b. I na anu ogwu ugbu a? maka gini?

Do you have wounds anywhere on your body?
  I nwere onya ebe o bula na ahu gi?
INCLUDE SOMEONE NEGATIVE TO THE ABOVE AND IN ADDITION IS POSITIVE TO THESE:

Aged 18 to 69 years, with back pain lasting for more than 12 weeks.
Not pregnant
Can hear well, speak well, and is coherent

COMORBIDITY- I nwere oria ndi ozo? (Biko gwa m ha nile)

Duration (years) – Kedu aho ole kemgbe i nwebere ukwu mgbua?

WHODAS 2.0 36-ITEM VERSION, INTERVIEWER-ADMINISTERED (World Health Organisation Disability Assessment Schedule)

Instructions to the interviewer are written in bold and italics-do not read these aloud. Text for the respondent to hear is written in standard print in blue or Igbo.

Read this text aloud

Section 1: Face sheet

<table>
<thead>
<tr>
<th>Complete</th>
<th>F1-F5 before starting each</th>
<th>interviewer</th>
</tr>
</thead>
<tbody>
<tr>
<td>items</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F1</td>
<td>Respondent identity number</td>
<td></td>
</tr>
<tr>
<td>F2</td>
<td>Interviewer identity number</td>
<td></td>
</tr>
</tbody>
</table>
Section 2: Demographic and background information

Ajuju onu a bu ndi World Health Organisation (WHO) weputara ya ka ewere ghota nsogbu ndi mmadu na enwe gbasara onodu ahu ike ha (ukwu mgbu). Aziza gi niile no na akwukwo a bu naani maka iji wee mee ihe nyocha a burukwa ihe agaghi ugosi ndi ozo. Ajuju a ga ewe nkeji iri na ise ma o bu iri abuo iji wee zachaa ya.

For respondents from the general population (not the clinical population) say:

O burugodi na inweghi ahuike ma o bu na inweghi nsogbu obula, e kwesiri m iuchaa ajuju nile a, iji wee mee ka ihe nyochaa zuo oke.

Aga m amalite iju ajuju ndabere iji malite.

<table>
<thead>
<tr>
<th>A1</th>
<th>Record sex as observed</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

| A2 | Afo ole ka i di ugbua? | ............years |

| A3 | Afo ole ka owere gi igu akwukwo na ulo akwukwo obula, koleji ma o bu mahadum? | ............years |

<table>
<thead>
<tr>
<th>A4</th>
<th>Gini bu onodu alumdi na nwanyi gi ugbua? (select the single best option)</th>
<th>Anughi m di ma o bu nwunye</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

<p>|    |                                                                       | Ano m na anu m di na nwunye |
|    |                                                                       | 2                           |</p>
<table>
<thead>
<tr>
<th></th>
<th>A nuru m di ma o bu nwunye mana mu na ya ebighizi</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mu na di ma o bu nwunye m gbara alukwaghi m</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Di m ma o bu nwunye m nwuru anwu</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Mu na enyi m nwoke ma o bu nwanyi bi</td>
<td>6</td>
</tr>
</tbody>
</table>

**A5**  
**Kedu uzo ka mma aga ejikowaa oru gi?**  
*(select the single best option)*

<table>
<thead>
<tr>
<th></th>
<th>Oru a na akwu m ugwo</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>E nwere m oru nke onwe m dika izu ahia ma o bu oru ugbo</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>A na m aru oru anaghi akwu m ugwo</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Nwata akwukwo</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Ana m eleo ezi n’ulo m anya. Onweghi ihe ozo m na aru.</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>A lara m ezumike nka</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Enweghi m oru (maka ahu ike m)</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Enweghi m oru (maka ihe ndi ozo)</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Ihe ndi ozo (biko kowaa)</td>
<td>9</td>
</tr>
</tbody>
</table>
Section 3: Preamble

Say to respondent:

Ajuju onu a bu maka nsogbu ndi mmadu na enwe na onodu ahu ike ha (dika ukwu mgbu).

Hand flashcard to #1 to respondent and say:

Gbasara onodu ahu ike a, ihe m na akowa bu nsogbu nile i na enwe gbasara oria gi (ukwu mgbu gi).

Chetakwa ka i buru onodu gbasara oria gi (ukwu mgbu gi) na obi ka i na aza ajuju ndi a. Mgbe m juo gi ajuju gbasara nsogbu i na enwe mgbe o bula i choro ime ihe, burukwa ihe ndi a na obi...

Point to flashcard #1 and explain that ‘ihe ira ahu’ putara:

• Igbawanye oke mbo
• Mmekpa ahu ma o bu ihe mgbu
• Ime ihe nwanyo
• Mgbanwe ma o bu ihe di iche na uzo isi eme ihe

Say to respondent:

Mgbe i na aza ajuju a, aga m acho ka iche echiche maka ubochi iri ato gara aga. Aga m acho ka izaa ajuju ndia nile ka i na echeta udi nsogbu nile inwegoro mgbe i na eme ihe ndi i na eme bu etu isi eme bu ha na m bu ka mgbe ubochi iri ato gara aga.

Hand flashcard #2 to respondent and say:

Jiri usoro onu ogugu ndia mgbe i na aza ajuju ndi a.

Read the scale aloud:

Onweghi/Odighi, obere, ogafeghi oke, o siri ike, ogafere oke/enweghi m ike ime.

Ensure that the respondent can easily see the flashcards #1 and #2 throughout the interview

Section 4: Domain reviews

Domain 1: Cognition

Ugbu a, aga m aju gi ajuju gbasara etu isi aghota ihe na etu isi agwa mmadu okwu.
Show flashcards #1 and #2 to respondent

<table>
<thead>
<tr>
<th>Na ubochi iri ato gara aga, kedu ihe isi ike i na enwe na ihe ndia:</th>
<th>Onweghi/Odighi obere</th>
<th>ogafeghi oke</th>
<th>o siri ike</th>
<th>ogafere oke/enweghi m ike ime</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1.1</td>
<td>Echiche gi idigide na ihe i na eme ruo nkeji iri?</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>D1.2</td>
<td>Icheta ime ihe ndi di mkpa?</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>D1.3</td>
<td>I nyocha na ichoputa usoro iga eji gbo mkpa di ri gi ubochi kwa ubochi?</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>D1.4</td>
<td>Imuta ihe ohuru, dika imuta etu I ga esi aga ebe I gabeghi mbu?</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>D1.5</td>
<td>I ghota ihe nile ndi mmadu na ekwu?</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>D1.6</td>
<td>I malite na inogide na mkparita uka?</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Domain 2: Mobility

Ajuju m ga aju gi ugbu a bu maka nsogbu I na enwe na ikpaghari.
**Show flashcards #1 and #2**

<table>
<thead>
<tr>
<th>Na ubochi iri ato gara aga, kedu ihe isi ike I na enwe na ihe ndia:</th>
<th>Onwe ghi/O dighi</th>
<th>obere</th>
<th>ogafeghi oke</th>
<th>o siri ike</th>
<th>ogafere oke/enweg hi m ike ime</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>D2.1</strong> Ikwuru oto tee aka dikankeji iri ato?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><strong>D2.2</strong> Ikwuru oto mgbe inoduchara ala?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><strong>D2.3</strong> Igaghari agaghari na ime ulo gi?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><strong>D2.4</strong> Isi na ulo gi puo apuo?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><strong>D2.5</strong> I ga ije tere aka dika otu kilometa (ma o bu ihe dika ya)?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

**Domain 3: Self-care**

Ajuju m ga aju gi ugbu a bu maka ihe isike I na enwe maka ilekota onwe gi anya.

**Show flashcards #1 and #2**

<table>
<thead>
<tr>
<th>Kemgbe ubochi iri ato gara aga, kedu nsogbu I na enwe ime ihe ndi a:</th>
<th>Onwe ghi/O dighi</th>
<th>obere</th>
<th>ogafeghi oke</th>
<th>o siri ike</th>
<th>ogafere oke/enweg hi m ike ime</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>D3.1</strong> Isa ahu gi nile?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><strong>D3.2</strong> Iyinye akwa?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><strong>D3.3</strong> Iri nri?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><strong>D3.4</strong> Ino nani gi ubochi ole na ole?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Domain 4: Getting along with people

Ajuju m ga aju gi ugbua bu maka ihe isike I na enwe gi na ndi mmadu imekorita. Biko cheta na o bu soso ihe isike maka ihi oria gi (ukwu mgbu gi). Ihe m na akowa bu nsogbu gbasara oria gi (ukwu mgbu gi).

*Show flashcards #1 and #2*

<table>
<thead>
<tr>
<th>Kemgbe ubochi iri ato gara aga, kedu nsogbu I na enwe ime ihe ndi a:</th>
<th>Onweghi/Odighi</th>
<th>obere</th>
<th>ogafeghi oke</th>
<th>o siri ike</th>
<th>ogafere oke/enwe ghi m ike ime</th>
</tr>
</thead>
<tbody>
<tr>
<td>D4.1 Imeso ndi I maghi omume?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>D4.2 Inogide na enyi gi na ndi ozo nwere?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>D4.3 Ihe I ga nke oma na etiti ndi gi na ha di na mma, ya na ezi n’ulo gi?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>D4.4 Imete enyi ohuru?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>D4.5 Mmekorita nwoke na nwanyi?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Domain 5: Life activities

5(1): Household activities

Ugbu a, aga m aju gi ihe gbasara ihe ndi I na eme iji akwado ezi n’ulo gi, na ilekota ndi gi na ha bi ma o bu ndi no gi na akuku. Ihe ndi a gunyere isi nri, ihicha ulo, izuta ihe na ahia, ilekota mmadu na ilekota ihe ndi i nwere.

*Show flashcards #1 and #2*
### N’ihi oria gi (ukwu mgbu gi), kamgbe ubochi iri ato gara aga, kedu nsogbu i na enwe ime ihe ndi a:

<table>
<thead>
<tr>
<th>Question</th>
<th>Onweghi/Obere</th>
<th>Orę</th>
<th>Ogarfeghị Oke</th>
<th>O Sirị</th>
<th>Ogarfeghị Oke/Enweghi M Ihe Ime</th>
</tr>
</thead>
<tbody>
<tr>
<td>D5.1</td>
<td>Ilekota oru diri gi na ezi n’ulo gi?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>D5.2</td>
<td>Ime ihe diri gi, ndi kachasi mkpa na ezi na ulo gi nke oma?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>D5.3</td>
<td>Irucha oru nile I kwesiri iru na ezi n’ulo gi?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>D5.4</td>
<td>Igbalị ihu na aruchara oru diri gi na ezi na ulo gi ososo ka okwesiri?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

If any of the responses to D5.2-D5.5 are rated greater than none (coded as “1”), ask:

| D5.01 | Kamgbe ubochi iri ato gara aga, ubochi ole ka ibelatara oru ezi n’ulo ma o bu hapu kpam kpam oru ezi n’ulo gi n’ihi oria gi (ukwu mgbu gi)? | Record number of days........ |

If the respondent works (paid, non-paid, self-employed) or goes to school, complete questions D5.5-D5.10 on the next page. Otherwise, skip to D6.1 on the following page.

5(2): Work or school activities

Ugbu a, aga m aju gi ajuju gbasara oru gi ma o bu ihe ndi i na eme na ulo akwukwo

Show flashcards #1 and #2
| N'ihi oria gi (ukwu mgbu gi), na ubochi iri ato gara aga, kedu ka osi raa gi ahu ime ihe ndi a: | Onweghi/Odighi obere ogafeghi o siri ike ogafere oke/enweghi m ike ime |
| --- | --- | --- | --- | --- |
| **D5.5** Oru diri gi ubochi kwa ubochi na ulo oru/ulo akwukwo gi? | 1 | 2 | 3 | 4 | 5 |
| **D5.6** Ime ihe ndi diri gi kachasi mkpa na ulo oru gi/ulo akwukwo gi nke oma? | 1 | 2 | 3 | 4 | 5 |
| **D5.7** Irucha oru nile ikwesiri iru? | 1 | 2 | 3 | 4 | 5 |
| **D5.8** Irucha oru gi ngwangwa ka okwesiri? | 1 | 2 | 3 | 4 | 5 |
| **D5.9** I wetunatara aka na oru gi maka ihi oria gi (ukwu mgbu gi)? | Mba | 1 |
| | Ee | 2 |
| **D5.10** I ritere obere ego karia ka odii na mbu maka ihi oria | Mba | 1 |
| | Ee | 2 |
If any of D5.5-D5.8 are rated greater than none (coded as “1”), ask:

<table>
<thead>
<tr>
<th>D5.02</th>
<th>Na ubochi iri ato gara aga, ubochi ole ka I rughi oru okara ubochi ma o bu karia maka ihi oria gi (ukwu mgbu gi)?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Record number of days............</td>
</tr>
</tbody>
</table>

Domain 6: Participation
Ugbu a, a ga m aju gi ajụjụ gbasara etu isi esonye na ihe gbasara obodo gi na ka onodu ukwu mgbu gi si emetuta gi na ezị n’ulo gi. Ufodu ajụjụ a nwere ike igbasa nsogbu ndi i gabigara ubochi iri ato, mana ka I na aza ajụjụ ndị a, biko gbado anya na ubochi iri ato gara aga. Ozo, ana m echetara gi ka I zaa ajụjụ ndị a ka I na-eche banyere oria gi (ukwu mgbu gi).

Show flashcards #1 and #2

<table>
<thead>
<tr>
<th>Ka mgbe abali iri ato gara aga:</th>
<th>Onweghi/Odighi</th>
<th>obere</th>
<th>ogafe ghi oke</th>
<th>o siiri ike</th>
<th>ogafere oke/enweg hi m ike ime</th>
</tr>
</thead>
<tbody>
<tr>
<td>D6.1</td>
<td>Kedu oke nsogbu i nwere na iso ihe di iche iche a na eme na obodo (dika mmemme ndi obodo, mmemme ulo uka ma o bu ihe ndi ozo di iche iche) dika etu onye o bula nwere ike ime?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>D6.2</td>
<td>Kedu oke nsogbu ole 1 nwere maka mgbochi ma o bu odachi na uwa gbara gi gburu gburu?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>D6.3</td>
<td>Kedu oke nsogbu i nwere na ibi na ugwu diri mmadu maka ihi etu ndi mmadu si akpaso gi agwa na etu ha si emeso gi omume?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>D6.4</td>
<td>Oge ole ka itinyere na oria gi (ukwu mgbu gi) ma o bu ihe si na ya puta?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>D6.5</td>
<td>Kedu oke uzo esi metuta nmuo ma o bu mkpuru obi gi maka ihi oria gi (ukwu mgbu gi)?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>D6.6</td>
<td>Kedu oke oria gi (ukwu mgbu gi) si erida ma o bu metuta onodu ego gi ma o bu ego ndi ezi n’ulo gi?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>D6.7</td>
<td>Kedu oke nsogbu ezi n’ulo gi nwere</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>maka ihi oria gi (ukwu mgbu gi)?</td>
<td></td>
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<td></td>
<td></td>
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<td>---</td>
<td>----------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D6.8</td>
<td>Kedu oke nsogbu inwere na iji aka gi eme otutu ihe ga enye gi ezumike ma o bu obi uto?</td>
<td></td>
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</table>

<p>| | | | | |</p>
<table>
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<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

**H1**

Iji chikota ihe nile, na ubochi iri ato gara aga, na ime ubochi ole ka nsogbu ndi a biara?

**Record number of days........**

**H2**

Na ubochi iri ato gara aga, na ime ubochi ole ka 1 na enweghi ike kpata kpata ime ihe 1 na adi eme na mbu ma o bu oru gi maka ihi oria gi (ukwu mgbu gi)?

**Record number of days........**

**H3**

Na ubochi iri ato gara aga, na agunyeghi ubochi ndi 1 na enweghi ike kpata kpata, ubochi ole ka 1 wedatara aka na ihe ndi 1 na eme na mbu ma o bu oru maka oria gi (ukwu mgbu gi)?

**Record number of days........**

Nke a bu njedebe ajuju onu a. Ndewo maka isonye.

**WHODAS FLASHCARD 1**

**Health condition:**
- Azu ukwu mgbu

**Having difficulty with an activity means:**
- I gbawanye mbo
- Mmekpa ahu ma o bu ihe mgbu
Think about the past 30 days only.

*WHODAS FLASHCARD 2*
ROLLAND MORRIS DISABILITY 
QUESTIONNAIRE (RMDQ) with instructions

Mgbe o bula ukwu na egbu gi mgbu, I nwere ike ihu na ufodu ihe i na eme mgbe mbu nweziri ike ihia gi ahu ime. Ihe ndia edeputara bu etu ndi mmadu siri kowaa onwe ha mgbe ha na enwe ukwu mgbu. Mgbe i guo ha ma o bu mmadu aguoro gi ha, I nwere ike ifu na ufodu kowara ka o di gi ubochi taa. I na agu ihe ndia, ma o bu mmadu ana aguru gi ha, chee maka onwe gi ubochi taa. Mgbe o bula i guru, ma o bu mmadu guru gi nke kowara gi ubochi taa, Kanye ihe na ya ma o bu gwa onye guputara gi ya ka o kanye ihe na ya. O buru na okwu o bula akowaghi gi, hapu okwu ahu ma jee na nke ozo. Chetakwa ka i kanye ihe soso mgbe i kwetara na o kowara gi ubochi taa.

1. Ana m ano n’ulo, o foro ntakiri ka o buru mgbe nile n’ihi ukwu m.
2. Ana m anoghari otutu oge iji nweta onodu ga adiri ukwu m mma.
3. Eji m nwayo aga ije karia etu okweri maka ihi ukwu m
4. Maka ihi ukwu m, anaghi m aru oru o bula m na arubu n’ulo ma o bu akuku ulo.
5. Maka ihi ukwu m, ana m ejide ihe aka step ma m na arigo ulo elu.
6. Maka ihi ukwu m, ana m edina ala izu ike mgbe mgbe karai na mbu.
7. Maka ihi ukwu m, ana m ejide ihe aka wee bilie na oche nwere aka.
8. Maka ihi ukwu m, ana m ejisi ike achota ndi ozo ka ha mere m ihe.
9. Ana m eji nwayo nwayo eyiri akwa karia ka m kwesiri maka ihi ukwu m.
10. Ana m akwu oto obere oge maka ihi ukwu m.
11. Maka ihi ukwu m, ana m ejisi ike ghara ihu ehu ma o bu sekpuru ala.
12. O na ahia m ahu isi na oche ebili maka ihi ukwu m.
13. Ukwu m na-egbu m mgbu, oforo ntakari ka o buru mgbe niile.
14. Ona ahia m ahu itughari ma m dina ala maka ihi ukwu m.
15. Agu anaghi agu m nke oma maka ihi ukwu mgbu m
16. Ana m enwe nsogbu iyinye akpukpu ukwu m maka ihi mgbu di na ukwu m.
17. Ana m aga soso ije eteghi aka maka ihi ukwu mgbu m
18. Anaghi m arahu ura nke oma maka ihi ukwu m.
19. Maka ihi ukwu mgbu m, onye ozo na enyere m aka i yiri akwa
20. Ana m anodu ala otutu oge na ubochi maka ukwu m
21. Ana m ezere oru ike di n’ulo maka ihi ukwu m
22. Maka ihi ukwu mgbu m, ana m enwe mgbakasi ahu na iwe oku ebe ndi mmadu no karia mgbe mbu.

23. Maka ihi ukwu m, ana m eji nwayo nwayo arigo ulo elu ma o bu igbago ugwu karia na mbu.

24. Ana m edina ala otutu oge maka ihi ukwu m

**11-Point box scale (BS-11)**

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Enweghi ihe mgbu</td>
<td>Obere mgbu</td>
<td>mgbu agafeghi oke</td>
<td>mgbu ojoo ezie</td>
<td>mgbu ojoo nke ukwu</td>
<td>Mgbu kachasi mgbu</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

566
**Hospital Anxiety and Depression Scale (HADS)**

Ndi na afu ndi oria n’ulo ogwu maara na ihe na emetuta obi mmadu di mkpa na otutu oria. o buru na onye na afu gi mara banyere ihe ndi a, o ga-enwe ike inyere gi aka nke oma.

Ajuju nchoputa a bu iji nyere onye na afu gi aka iji mara etu obi di gi. A ga a guru gi ihe ndi a, ma zakwaa nke biara gi na obi ngwangwa iji kowaa etu obi di gi **kemgbe izu uka gara aga.**

Egbuna oge iji zaa aziza ndi a, aziza i zara ozugbo bu ya nwere ike ikowa etu obi di gi karia aziza i chere eche oge tere aka wee zaa.

<table>
<thead>
<tr>
<th>A</th>
<th>Onwe m adighi m juu:</th>
</tr>
</thead>
<tbody>
<tr>
<td>O foro ntakiri ka o buru mgbe nile</td>
<td>3</td>
</tr>
<tr>
<td>Otutu oge</td>
<td>2</td>
</tr>
<tr>
<td>Site n’oge ruo n’oge, kwa mgbe kwa mgbe</td>
<td>1</td>
</tr>
<tr>
<td>Adighi m enwe ya ma oli</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D</th>
<th>O di m ka a na m emez ihe nwayo nwayo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oforo ihe nta ka o buru mgbe nile</td>
<td>3</td>
</tr>
<tr>
<td>Otutu mgbe</td>
<td>2</td>
</tr>
<tr>
<td>Mgbe ufodu</td>
<td>1</td>
</tr>
<tr>
<td>Odighi ma oli</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A</th>
<th>Ihe ndi ahu na amasibu m ka na amasim</th>
</tr>
</thead>
<tbody>
<tr>
<td>Etu m si enwe ya na mbu krom kwem</td>
<td>0</td>
</tr>
<tr>
<td>O buchaghi etu m si enwe na mbu</td>
<td>1</td>
</tr>
<tr>
<td>Nwantakiri</td>
<td>2</td>
</tr>
<tr>
<td>Oraka ahu</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D</th>
<th>A na m enwe ujo dika ume mmiri a na efepu m na afo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odighi ma oli</td>
<td>0</td>
</tr>
<tr>
<td>Kwa mgbe kwa mgbe</td>
<td>1</td>
</tr>
<tr>
<td>Otutu mgbe</td>
<td>2</td>
</tr>
<tr>
<td>O foro ntakiri ka o buru mgbe nile</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A</th>
<th>A na m enwe ujo ka ihe di egwu o na akwado ime</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kpomkwem ma dikwa njo nke ukwu</td>
<td>3</td>
</tr>
<tr>
<td>Ee, ma obughii na njo nke ukwu</td>
<td>2</td>
</tr>
<tr>
<td>Obere ma onaghi eche m uche</td>
<td>1</td>
</tr>
<tr>
<td>Odighi ma oli</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D</th>
<th>A kwusiri m inwe mmasi n’etu m di n’ile anya</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kpom kwem</td>
<td>3</td>
</tr>
<tr>
<td>Anaghi m elebara ya anya dika m kwsiri</td>
<td>2</td>
</tr>
<tr>
<td>E nwere m ike i hapu ilebara ya anya dika o kwsiri</td>
<td>1</td>
</tr>
<tr>
<td>A na m elekota ya anya etu okwesiri</td>
<td>0</td>
</tr>
</tbody>
</table>
### Normal, Mild, Moderate, Severe

<table>
<thead>
<tr>
<th>Score Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-7</td>
<td>Normal</td>
</tr>
<tr>
<td>8-10</td>
<td>Mild</td>
</tr>
<tr>
<td>11-15</td>
<td>Moderate</td>
</tr>
<tr>
<td>16-21</td>
<td>Severe</td>
</tr>
</tbody>
</table>

**ALTERNATIVE SCORING:**

<table>
<thead>
<tr>
<th>Score Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-7</td>
<td>Normal</td>
</tr>
<tr>
<td>8-10</td>
<td>Borderline abnormal</td>
</tr>
<tr>
<td>11-21</td>
<td>Abnormal</td>
</tr>
</tbody>
</table>
PAIN COPING STRATEGIES QUESTIONNAIRE

Ndi mmadu ndi na enwe ahu mgbu achoputala uzo ole na ole ha na eji na-anagide ihe mgbu ha. Nke a gunyere I na-agwa onwe ha okwu nkasiobi mgbe o bula ha na enwe ahu mgbu, isonyere na ufodu emume di iche iche. Ihe na-esota ugbu a bu usoro ndi n’enwe ahu mgbu kowaputara ha na eme mgbe ha na enwe ahu mgbu. Maka ihe omume nke o bula, biko were ihe skelu a (ihe a akara aka) gosi ihe ndi a, etu I na-esi etinye onwe gi na ihe omume ahu mgbe o bula I na enwe ahu mgbu, were ihe dika EFU/ONWEGHI MGBE gosi na INAGHI eme ihe ahu ma oli mgbe o bula I na-enwe ahu mgbu, were akara nke ATO gosi na I na eme ihe ahu MGBE UFODU I na enwe ahu mgbu, were kwa akara nke ISII gosi na I na eme ihe ahu MGBE NILE I na enwe ahu mgbu. Chetakwa na i nwekwara ike I were akara o bula n’ime ihe otutu skelu a (ihe a akara aka) kowaa ya.

<table>
<thead>
<tr>
<th>EFU/ONWEGHI MGBE</th>
<th>MGBE UFODU</th>
<th>MGBE NILE</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Mgbe m na enwe ahu mgbu...
1. Ana m agbali ka m chefue ya ma o bu mee ka o dika na obughi na ahu m ka ahu mgbu ahu di site na ibu na echiche na obu na ahu onye ozo.
2. Ana m esi n’ulo ebe m no puo ga mee ihe dika I ga ahia ma o bu I ga lee ihe nkiri onyo onyoo
3. Ana m agbali chee echiche ihe na enye obi uto.
4. Anaghi m eche ya na o bu ahu mgbu, kama a na m ewere ya na o ihe na emetuta m na ahu ma o bu ihe na ekpo oku.
5. Okacha m njo ma dikwa m ka ogaghi adikwa mma
6. Ana m agwa onwe m, ka m nwee mmuo siri ike ma jisie ike na-agbali n’agbayeghi ahu mgbu ahu
7. A na m agu akwukwo
8. A na m agwa onwe m na m ga-emeri ihe mgbu a.
9. A na m agu onuogugu n’isi m ma o bu na ekwe ukwe na obi m
10. A na m ewe ya dika ihe ozo na eme m, ihe dika ihe mmekpa ahu ozo dika otita ngwere
11. bu ihe jogburu onwe ya, dikwa m ka o na anyigbu m ma o bu akuda m.
12. A na m egwuri ufodu egwu di iche n’ime uche m ma o bu ata orji isi iji wepu uche m na ihe mgbu a.
13. di m ka ndu m di enweghi isi
14. A mara m na otu ubochi, otu onye ga agbatara m oso enye maaka mee ka ihe mgbu a puo nwa obere oge.
15. Ana m ekpere Chineke ka o ghar a inote aka
16. Ana m ejisi ike ghara iche ya ka o bu ahu m, kama ka ihe iche na ebe m no.
17. A naghi m eche maka ihe mgbu a.
18. Ana m ejisie ike eche maka afo di n’ihu, etu ihe nile ga adi mgbe m chupugoro mgbu a.
19. A na m agwa onwe m na onaghi egbu m.
20. A na m agwa onwe m na agaghi m ekwe ka ihe mgbu a gbochie ihe o bula m kwesiri ime.
21. Anaghi m etinyere ya uche o bula.
22. E nwere m okwukwe na ebe ndi dibia bekee no, na otu ubochi aga enwe ogwugwo maka ihe mgbu m.
23. Na agbanyegehi ka osina di njo, a mara m na m ga anagide ya.
24. A na m eme ka aga asi na o noghi ebe ahu
25. na eche m echiche mgbe nile ma ihe a oga ebi
26. A na m eji obi m na atughari ihe obi uto mere mgbe gara aga.
27. A na m eche maka ndi mmadu o na ato m uto mu na ha imeko ihe
28. A na m ekpe ekpere ka ihe mgbu a kwusi.
29. A na m erube na obi m, ma o bu were ya na ihe mgbu a anoghi n’ime ahu m
30. A na m aga n’ihu eme ihe dika onweghi ihe mere
31. A na m ahuta ya dika ihe ima aka wee hapu ime ka o buru ihe ga enye m nsogbu ma o bu mekpaa m ahu.
32. Na agbanyegehi na o na egbu mgbu, a na m aga n’iru na eme ihe m na eme
33. na-adiz m ka agagh m anagidezi ya ozo
34. A na m agbali I na anoyere ndi mmadu ozo
35. A na m elaghara ya anya
36. A na m adabere na okwukwe m na Chineke.
37. na adim ka agagh m emeli ihe a gaba n’iru
38. A na m eche maka ihe ndi na ato m uto ime.
39. A na m eme ihe o bula iji ewepu obi m na ihe mgbu a.
40. A na m eme ihe na eme m obi uto dika ile igwe onyonyo TV ma o bu ige egwu.
41. A na m eme ka agasi na o bughi akuku ahu m.
42. A na m eme ihe mmeghari ahu dika ije ozi ime ulo ma o bu oru ndi ozo.

Dabere na ihe niile i na-eme iji nagide mgbu gi, na otu ubochi, kedu njikwa ole o di gi ka i nwere ebe mgbu a no? Biko gwam ka m Kanye gburbuduru (circle) na ihe ogugu nke kwesiri ma o bu Kanye ihe gburbuduru na nke i choro. Na-echeta, j nwere ike ikwu ma o bu Kanye na ihe ogugu o bu na ihe skelu a:

<table>
<thead>
<tr>
<th>Okweghi njikwa</th>
<th>Onweturu njikwa</th>
<th>E nwere m</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

njikwa nke oma
Dabera na ihe niile i na-eme iji nagide mgbu gi, na otu ubochi, kedu etu oile i nwere ike ibelata ya? Biko gwam ka m Kanye gburbuduru (circle) na ihe ogugu nke kwesiri ma o bu Kanye ihe gburbuduru na nke i choro. Na-echeta, j nwere ike ikwu ma o bu Kanye na ihe ogugu o bu na ihe skelu a:

<table>
<thead>
<tr>
<th>O kweghi m ebelata</th>
<th>A na m ebelatatu ya</th>
<th>A na m ebelata ya kpamkpam</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>
MULTIDIMENSIONAL SCALE OF PERCEIVED SOCIAL SUPPORT

Ntuziaka: Anyị nwere mmasị na etú i si na-echere banyere ihe ndị na-esọ okwu a edeputara. Kpachara anya guo ma o bu gee nti na ihe nkwuputa a edeputara n’otu n’otu. Na-egosi etú i na-echere banyere nkwuputa a n’otu n’otu.

Tinye akara ma o bu kwuo otu (1) ma o buru na i jusiri ike kpam kpam
Tinye akara ma o bu kwuo abuo (2) ma o buru na i jusiri ike
Tinye akara ma o bu kwuo ato (3) ma o buru na i juru aju ntakiri
Tinye akara ma o bu kwuo ano (4) ma o buru na onweghi ebe i kwu akwu.
Tinye akara ma o bu kwuo ise (5) ma o buru na i kwenyere ntakiri
Tinye akara ma o bu kwuo isii (6) ma o buru na i kweny e siri ike
Tinye akara ma o bu kwuo asaa (7) ma o buru na i kweny esiri ike kpam kpam.

1. O nwere onye dikarisiri iche na ano m nso mgbe m no na mkpa
   1  2  3  4  5  6  7 SO

2. O nwere onye dikarisiri iche na eso m ekere oke na obi uto m ma o bu n’iru uju m.
   1  2  3  4  5  6  7 SO

3. Ndi ezi n’ulo m na agbali si ike i nyere m aka
   1  2  3  4  5  6  7 Fam

4. A na m enweta agba m ume na nkwa do m choro na ezi n’ulo m
   1  2  3  4  5  6  7 Fam

5. E nwere m onye dikarisiri iche na aburu m ezi nkasi obi
   1  2  3  4  5  6  7 SO

6. Ndi enyi m na--agbali n’ezie i nyere m aka
   1  2  3  4  5  6  7 Fri

7. E nwere m ike i chekwube ma o bu i dabere na ndi enyi m mgbe ihe mebie
   1  2  3  4  5  6  7 Fri

8. Mu na ndi ezi n’ulo m nwere ike ikpa maka nsogbu m
   1  2  3  4  5  6  7 Fam

9. E nwere m ndi enyi nwere ike iso m kere oke mgbe m no na ọ bụ ma o bu mgbe m na eri uju
   1  2  3  4  5  6  7 Fri
10. Onwere onye dikarisiri iche na ndu m, ihe banyere m gbasara/na emetuta na obi

11. Ndi ezi n’ulo m di njikere i nyere m aka ime mkpebi

12. Mu na ndi enyi m nwere ike ikpa maka nsogbu m

The items tended to divide into four factor groups relating to the source of the social support, namely family (Fam), friends (Fri) or significant other (SO).
OCCUPATIONAL RISK FACTOR QUESTIONNAIRE

Ka anyi wee nwee ike i nyere gi aka nke oma, o di mkpa ka anyi mara maka oru I na aru. Biko zaa ajuju ndi aga aju gi. Biko zaa ha nile.

Biko kowaa ihe bu isi ihe di na oru I na aru

Biko zaa EE ma o bu MBA iji zaa ajuju ndi a n’otu na otu

1. I nwere ike I nara ezumike maka ubochi o bula na oru gi tinyere ezumike nke eweputara gi n’ime ubochi o bula?
   Ee       Mba

2. I na achoputakari na o nwere mgbe I nweghi ike ire oru n’ihi ihe ndaputa, dika mgbe igwe eji aru oru mebiri ma o bu na ngwa oru adighi?
   Ee       Mba

3. I nwere ike ichikwa na ihazicha etu oru si agara gi?
   Ee       Mba

4. Nchikwa na nhazi oru gi o dabere na ihe ndi ozo (dika igwe oru machine, igwe computer, ndi azuma ahia)
   Ee       Mba

5. I na aru oru na onodu nmanye dika oge, ezughi ike ma o bu ngwa ngwa I gbanari oge?
   Ee       Mba

Oge ole ka o na ewe gi ime ihe ndi a n’ulo oru, inodu ala/ma o bu ikwuru oto

6. Ihuru ala ntakiri, aka gi agaghi ero ikpere gi
   i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme
   ii. Ihe dika pecenti iri na oge oru
   (ma o bu ihe kariri okara otu ubochi n’ime otu izu uka nwere ubochi asaa)
   iii. Ihe dika pecenti iri abuo na ise na oge oru
iv. Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa

v. Ihe dika pecenti iri asaa na ise na oge oru

vi. O foro ntakiri ka o buru mgbe nile

7. Ihuru ala ka aka gi gafee ikpere gi

i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme

ii. Ihe dika pecenti iri na oge oru

iii. Ihe dika pecenti iri abuo na ise na oge oru

iv. Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa

v. Ihe dika pecenti iri asaa na ise na oge oru

vi. O foro ntakiri ka o buru mgbe nile

8. Inyaghari ma o bu ihighari etiti ahu karia ihe dika digrii iri ano na ise na ihulata gaa na akuku

i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme

ii. Ihe dika pecenti iri na oge oru

iii. Ihe dika pecenti iri abuo na ise na oge oru

iv. Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa

v. Ihe dika pecenti iri asaa na ise na oge oru
(ma o bu ubochi ise na ihe erughi okara otu ubochi na ime otu izu uka nwere ubochi asaa)

vi. O foro ntakiri ka o buru mgbe nile

Ihe dika oge ole ka i na eji eme ihe ndi a n’ulo oru gi (kwuo iji gosi nke bu aziza gi ka e were akara gosi nke bu aziza gi n’oge edeputara maka nke o bula)

9. Ibulite ihe buru ibu na anyi aru ihe dika mgbati aka gi

i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme

ii. Ihe dika pecenti iri na oge oru
   (ma o bu ihe kariri okara otu ubochi n’ime otu izu uka nwere ubochi asaa)

iii. Ihe dika pecenti iri abuo na ise na oge oru
    (ma o bu otu ubochi na ihe kariri okara n’ime otu izu uka nwere ubochi asaa)

iv. Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa

v. Ihe dika pecenti iri asaa na ise na oge oru
   (ma o bu ubochi ise na ihe erughi okara otu ubochi na ime otu izu uka nwere ubochi asaa)

vi. O foro ntakiri ka o buru mgbe nile

10. Iji otu aka buru ibu

i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme

ii. Ihe dika pecenti iri na oge oru
   (ma o bu ihe kariri okara otu ubochi n’ime otu izu uka nwere ubochi asaa)

iii. Ihe dika pecenti iri abuo na ise na oge oru
    (ma o bu otu ubochi na ihe kariri okara n’ime otu izu uka nwere ubochi asaa)

iv. Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa

v. Ihe dika pecenti iri asaa na ise na oge oru
   (ma o bu ubochi ise na ihe erughi okara otu ubochi na ime otu izu uka nwere ubochi asaa)

vi. O foro ntakiri ka o buru mgbe nile
11. Ibughari ihe ndi na adighi mfe I jide aka ma na enweghikwa ebe a na-ejide ya aka

i. **Oraka ahu/o foro nta ka o buru ihe anaghi eme eme**

ii. Ihe dika pecenti iri na oge oru
   (ma o bu ihe kariri okara otu ubochi n’ime otu izu uka nwere ubochi asaa)

iii. Ihe dika pecenti iri abuo na ise na oge oru
   (ma o bu otu ubochi na ihe kariri okara n’ime otu izu uka nwere ubochi asaa)

iv. **Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa**

v. Ihe dika pecenti iri asaa na ise na oge oru
   (ma o bu otu ubochi ise na ihe erughi okara otu ubochi na ime otu izu uka nwere ubochi asaa)

vi. **O foro ntakiri ka o buru mgbe nile**

12. I kwa ma o bu I doro ibu

i. **Oraka ahu/o foro nta ka o buru ihe anaghi eme eme**

ii. Ihe dika pecenti iri na oge oru
   (ma o bu ihe kariri okara otu ubochi n’ime otu izu uka nwere ubochi asaa)

iii. Ihe dika pecenti iri abuo na ise na oge oru
   (ma o bu otu ubochi na ihe kariri okara n’ime otu izu uka nwere ubochi asaa)

iv. **Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa**

v. Ihe dika pecenti iri asaa na ise na oge oru
   (ma o bu otu ubochi ise na ihe erughi okara otu ubochi na ime otu izu uka nwere ubochi asaa)

vi. **O foro ntakiri ka o buru mgbe nile**

13. Ibu ihe di aro dika pound iri ruo iri ato ma o bu kilogram ise ruo iri na ano ma o bu ihe na anyi ka mmiri lita ise ruo lita iri na ano

i. **Oraka ahu/o foro nta ka o buru ihe anaghi eme eme**

ii. Ihe dika pecenti iri na oge oru
   (ma o bu ihe kariri okara otu ubochi n’ime otu izu uka nwere ubochi asaa)

iii. Ihe dika pecenti iri abuo na ise na oge oru
iv. *Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa*

v. *Ihe dika pecenti iri asaa na ise na oge oru*

vi. *O foro ntakiri ka o buru mgbe nile*

14. Ibu ihe di aro kariri pound iri ato ma o bu kilogram iri na ano ma o bu ihe na anyi ka mmiri lita iri na ano

i. *Oraka ahu/o foro nta ka o buru ihe anaghi eme eme*

ii. *Ihe dika pecenti iri na oge oru*

iii. *Ihe dika pecenti iri abuo na ise na oge oru*

iv. *Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa*

v. *Ihe dika pecenti iri asaa na ise na oge oru*

vi. *O foro ntakiri ka o buru mgbe nile*

15. I bu ibu kariri pound iri ma o bu kilogram ise/ihe na anyi ka mmiri lita ise gaa ruo ihe kariri feet iri ano ma o bu site na ulo gi ruo ulo agbata obi gi

i. *Oraka ahu/o foro nta ka o buru ihe anaghi eme eme*

ii. *Ihe dika pecenti iri na oge oru*

iii. *Ihe dika pecenti iri abuo na ise na oge oru*

iv. *Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa*

v. *Ihe dika pecenti iri asaa na ise na oge oru*
vi. O foro ntakiri ka o buru mgbe nile

16. Inodu ala

i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme

ii. Ihe dika pecenti iri na oge oru
  (ma o bu ihe kariri okara otu ubochi n’ime otu izu uka nwere ubochi asaa)

iii. Ihe dika pecenti iri abuo na ise na oge oru
  (ma o bu otu ubochi na ihe kariri okara n’ime otu izu uka nwere ubochi asaa)

iv. Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa

v. Ihe dika pecenti iri asaa na ise na oge oru
  (ma o bu ubochi ise na ihe erughi okara otu ubochi na ime otu izu uka nwere ubochi asaa)

vi. O foro ntakiri ka o buru mgbe nile

17. Igbusa ikpere na ala, ma o bu ihuru ala

i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme

ii. Ihe dika pecenti iri na oge oru
  (ma o bu ihe kariri okara otu ubochi n’ime otu izu uka nwere ubochi asaa)

iii. Ihe dika pecenti iri abuo na ise na oge oru
  (ma o bu otu ubochi na ihe kariri okara n’ime otu izu uka nwere ubochi asaa)

iv. Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa

v. Ihe dika pecenti iri asaa na ise na oge oru
  (ma o bu ubochi ise na ihe erughi okara otu ubochi na ime otu izu uka nwere ubochi asaa)

vi. O foro ntakiri ka o buru mgbe nile

18. I rigoro ulo elu ma o bu elu obe/lada

i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme

ii. Ihe dika pecenti iri na oge oru
(ma o bu ihe kariri okara otu ubochi n’ime otu izu uka nwere ubochi asaa)

iii. Ihe dika pecenti iri abuo na ise na oge oru
(ma o bu otu ubochi na ihe kariri okara n’ime otu izu uka nwere ubochi asaa)

iv. Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa

v. Ihe dika pecenti iri asaa na ise na oge oru
(ma o bu ubochi ise na ihe erughi okara otu ubochi na ime otu izu uka nwere ubochi asaa)

vi. O foro ntakiri ka o buru mgbe nile

19. Iji ngwa oru aka oku latric a na-ejide n’aka aru oru (dika drills, saws, jack hammer)
i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme

ii. Ihe dika pecenti iri na oge oru
(ma o bu ihe kariri okara otu ubochi n’ime otu izu uka nwere ubochi asaa)

iii. Ihe dika pecenti iri abuo na ise na oge oru
(ma o bu otu ubochi na ihe kariri okara n’ime otu izu uka nwere ubochi asaa)

iv. Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa

v. Ihe dika pecenti iri asaa na ise na oge oru
(ma o bu ubochi ise na ihe erughi okara otu ubochi na ime otu izu uka nwere ubochi asaa)

vi. O foro ntakiri ka o buru mgbe nile

20. Inya ugbo ala ma o bu igwe ugbo ndi eji aru oru (gwongworo, ugbo ala ukwu, ugbo okporo igwe/ugbo oloko, forklifts)
i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme

ii. Ihe dika pecenti iri na oge oru
(ma o bu ihe kariri okara otu ubochi n’ime otu izu uka nwere ubochi asaa)

iii. Ihe dika pecenti iri abuo na ise na oge oru
(ma o bu otu ubochi na ihe kariri okara n’ime otu izu uka nwere ubochi asaa)
iv. Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa

v. Ihe dika pecenti iri asaa na ise na oge oru
   (ma o bu ubochi ise na ihe erughi okara otu ubochi na ime otu izu uka nwere ubochi asaa)

vi. O foro ntakiri ka o buru mgbe nile

21. Iru oru na ala na ami ami ma o bu ebe ala adighi larii
   i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme
   
   ii. Ihe dika pecenti iri na oge oru
    (ma o bu ihe kariri okara otu ubochi n’ime otu izu uka nwere ubochi asaa)
    
   iii. Ihe dika pecenti iri abuo na ise na oge oru
    (ma o bu otu ubochi na ihe kariri okara n’ime otu izu uka nwere ubochi asaa)

iv. Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa

v. Ihe dika pecenti iri asaa na ise na oge oru
   (ma o bu ubochi ise na ihe erughi okara otu ubochi na ime otu izu uka nwere ubochi asaa)

vi. O foro ntakiri ka o buru mgbe nile

22. Iru oru n’elu ihe/ebe di elu (dika n’elu ulo, lada, obe na ndi ozo)
   i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme
   
   ii. Ihe dika pecenti iri na oge oru
    (ma o bu ihe kariri okara otu ubochi n’ime otu izu uka nwere ubochi asaa)
    
   iii. Ihe dika pecenti iri abuo na ise na oge oru
    (ma o bu otu ubochi na ihe kariri okara n’ime otu izu uka nwere ubochi asaa)

iv. Ihe dika okara oge oru n’ime otu izu uka nwere ubochi asaa

v. Ihe dika pecenti iri asaa na ise na oge oru
   (ma o bu ubochi ise na ihe erughi okara otu ubochi na ime otu izu uka nwere ubochi asaa)

vi. O foro ntakiri ka o buru mgbe nile
Ugboro ole ka i na ebuli ihe di aro dika nke:

23. Ihe na erughi pound iri ma o bu kilogram ise ma o bu ihe na anyi ka mmiri lita ise
   vi. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme
   vii. orughi otu ugboro n’ime otu awa
   viii. site otu ugboro rue ugboro iri n’ime otu awa
   ix. site iri na otu ruo ugboro iri ato n’ime otu awa
   x. ihe kariri ugboro iri ato n’ime otu awa.

24. Ihe di pound iri ruo pound iri ato ma o bu kilogram ise ruo kilogram iri na ano ma o bu ihe na anyi ka mmiri lita ise ruo mmiri lita iri na ano
   i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme
   ii. orughi otu ugboro n’ime otu awa
   iii. site otu ugboro rue ugboro iri n’ime otu awa
   iv. site iri na otu ruo ugboro iri ato n’ime otu awa
   v. ihe kariri ugboro iri ato n’ime otu awa.

25. Ihe kariri pound iri ato ma o bu kilogram iri na ano ma o bu ihe na anyi ka mmiri lita iri na ano
   i. Oraka ahu/o foro nta ka o buru ihe anaghi eme eme
   ii. orughi otu ugboro n’ime otu awa
   iii. site otu ugboro rue ugboro iri n’ime otu awa
   iv. site iri na otu ruo ugboro iri ato n’ime otu awa
   v. ihe kariri ugboro iri ato n’ime otu awa.

Imeela maka oge i nyere anyi!
THE BRIEF ILLNESS PERCEPTION QUESTIONNAIRE

1. Kedu oke ole oria gi (ukwu mgbu gi) si emetuta ndu gi?

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<thead>
<tr>
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<th>2</th>
<th>3</th>
<th>4</th>
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<th>10</th>
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</thead>
<tbody>
<tr>
<td>Ometutaghi</td>
<td>M ma oli</td>
<td>ometutara ndu m nke ukwuu</td>
<td></td>
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<td></td>
<td></td>
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2. Ogologo oge ole ka o di gi ka oria gi (ukwu mgbu gi) ga anogide?

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</thead>
<tbody>
<tr>
<td>Ebighi ebi</td>
<td>oge</td>
<td>obere</td>
<td></td>
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3. Kedu oke njikwa i chere na i nwere ebe oria gi (ukwu mgbu gi) no?

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<td>njikwa nke ukwuu</td>
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4. Kedu oke ole o di gi ka ogwugwo i na a nata ga enyere oria gi (ukwu mgbu gi) aka?

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</thead>
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<td>o na enyere m aka nke ukwuu</td>
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5. Kedu oke Ole i na e nweta mgbaama (symptoms) na ihe gbasara oria gi (ukwu mgbu gi)?

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<tbody>
<tr>
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<td>otutu ihe mgbaama na enye oke nsogbu</td>
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6. Kedu oke nchegbu i nwere maka oria gi (ukwu mgbu gi)?

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<th>10</th>
</tr>
</thead>
<tbody>
<tr>
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<td>o na eche m uche nke ukwuu</td>
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7. Kedu oke ole i chere na i ghotara oria gi (ukwu mgbu gi)?

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<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aghotaghi m ya ma oli aghotara m ya, o doo m anya nke oma</td>
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</tbody>
</table>

8. Kedu oke ole oria gi (ukwu mgbu gi) ji emetuta gi na uche ma o bu obi? (dika, o na eme gi iwe, ujo, obi ojoo ma o bu obi i da mba/iweda mmuo gi?)

<table>
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<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>O bu obi</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
9. Biko deputa ma o bu kwuo n’usoro ihe ato kacha mkpa i kwere na o bu ha butere oria gi (ukwu mbu gi). Ihe ndi kacha mkpa butere m ya bu:

4. 

5. 

6. 

FEAR AVOIDANCE BELIEFS QUESTIONNAIRE

Nke a bu ufodu ihe ndi oria ndi ozo gwara anyi maka ahu mgbu ha. Kanye ihe ma o bu kwuo onu ogu nke o bu site na efu ruo na isii (0-6) iji kowaa udi mmeghari ahu dika ihulata ala, ibuli ihe, iga ije ma o bu inya ugbo ala ga esi emetuta ukwu mgbu gi.

<table>
<thead>
<tr>
<th>Ekweghi kpamkpam</th>
<th>Amachaghi m</th>
<th>i kwere kpam kpam</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
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<td>2</td>
</tr>
<tr>
<td>3</td>
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<td>5</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Ihe mgbu m bu Mmeghari ahu butere ya

2. Mmeghari ahu na eme ka mgbu m kara njo

3. Mmeghari ahu nwere ike inye m mmeru ahu na ukwu m.

4. Ekwesighi m ime mmeghari ahu maka na o nwere ike ime ka mgbu m kara njo

5. Enweghi m ike ime mmeghari ahu maka na o nwere ike ime/na eme ka mgbu m kara njo

Ihe ndi a edeputara gbasara etu oru l na aru si emetuta ukwu mgbu gi ma o bu etu o ga esi metuta ukwu mgbu gi

6. Mgbu m bu oru m na aru butere ya ma o bu ihe mberede na ulo oru.

7. Oru m na aru na eme ka mgbu m ka njo.

8. E nwere m ihe i ti aka na obi/ ma o bu uru m na enweta maka mgbu m.

9. Oru m na aru bu oru ike nke ukwuu.
10. Oru m na aru na eme ma o bu ga eme ka mgbu m ka njo.
11. Oru m na aru nwere ike i meru m ahu na ukwu.

12. Ekwesighi m i bu ihe mgbu nke na egbu m ugbu a na aru oru m na aru.

13. Enweghi m ike ibu mgbu a m na enwe ugbu a na aru oru m na aru.

14. Enweghi m ike iru oru m na aru ruo mgbe ihe mgbu m natara ogwugwo.

15. Echeghi m na m ga alaghachi na oru m na aru n’ime onwa ato

16. Echeghi m na m ga enwe ike ilaghachi ozo na oru m na aru.
**BACK PERFORMANCE SCALE (BPS)**

*The patient is to wear loose clothing and no shoes. The activities are explained and demonstrated to the patient. BPS scale: 0-15*

<table>
<thead>
<tr>
<th>Tests</th>
<th>Performance</th>
<th>Scoring categories</th>
<th>Scores</th>
</tr>
</thead>
</table>
| Sock test  | The patient is sitting on a high firm bench, the feet not reaching the floor. One leg is tested at the time-the least reach scored. Instruction: *jiri mkpisi aka abuo gi wee jide mkpisi ukwu gi ma o buru na isukoro ikpere gi?* | ➢ Can easily grab the toes with fingertips of both hands  
➢ Can grab the toes with fingertips, but with effort  
➢ Can reach beyond the malleoli, but not reach the toes  
➢ Can hardly, if at all, reach as far as to the malleoli | 0      |
| Pick-up test | The patient is standing on the floor. A curled piece of paper is dropped on the floor. Instruction: *tututa akwukwu a di n’ala? i nwere ike ya na uzo abuo ma o bu ato di iche iche i gosi na i na emegharinwu ahu?* | ➢ Can do the task with ease in varied ways  
➢ Can do the task with minor effort or some decreased flexibility  
➢ Can do the task with marked effort or lack of flexibility, may need support of hand on thigh  
➢ Cannot perform the task at all, or need external support | 0      |
| Roll-up test | The patient is lying supine on a firm mattress or plinth or table. Instruction: *jiri nwayo bilite nodu ala n’elu akwa, ukwu gi agbati a n’elu akwa, emegharighi aka gi?* | ➢ Can roll up with ease, to a long-sitting position  
➢ Can roll up with marked effort or partially to long-sitting position  
➢ Can roll up in supine position between the 8th and 12th thoracic vertebra | 0      |
<table>
<thead>
<tr>
<th>Test</th>
<th>Instructions</th>
<th>Possible Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finger tip-to floor test</td>
<td>The patient is standing on the floor, feet 10cm apart and knees straight. Instruction: <em>metu aka n’ala ma o bu ruo ebe i nwere ike?</em></td>
<td>0 1 2 3</td>
</tr>
<tr>
<td>Lift test</td>
<td>The patient is standing on the floor in front of a table. Instruction: <em>i nwere ike I buli akpati a elu site na ala ruo na tebul a, ma buchiya ya azu na ala ugboro ole I nwere ike na otu nkeji</em> The box, with grip: 1.35 kg, sized 0.36 x 0.36 x 0.25cm.</td>
<td>0 1 2 3</td>
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</tbody>
</table>

BPS sum score:
APPENDIX 21: TESTS FOR NORMALITY
### Tests of Normality

<table>
<thead>
<tr>
<th></th>
<th>Kolmogorov-Smirnov(a)</th>
<th>Shapiro-Wilk</th>
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<tbody>
<tr>
<td></td>
<td>Statistic</td>
<td>df</td>
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<tr>
<td>RMDQTOTAL</td>
<td>.100</td>
<td>200</td>
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<tr>
<td>PAINSSCALE</td>
<td>.107</td>
<td>200</td>
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<tr>
<td>HADSANXIETYTOTAL</td>
<td>.094</td>
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<tr>
<td>HADSDEPRESSIONTOTAL</td>
<td>.117</td>
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<tr>
<td>MSPSSTOTAL</td>
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<td>BIPQTOTAL</td>
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<td>FABQPHYSICALACTIVITY</td>
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<td>ORFQTOTALSCORES</td>
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<td>Descriptives</td>
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<td>Std. Error</td>
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<tr>
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<td></td>
<td>Variance</td>
<td>76.010</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation</td>
<td>8.718</td>
</tr>
<tr>
<td></td>
<td>Minimum</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Maximum</td>
<td>63</td>
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<td></td>
<td>Range</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>Interquartile Range</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Skewness</td>
<td>-0.336</td>
</tr>
<tr>
<td></td>
<td>Kurtosis</td>
<td>0.192</td>
</tr>
<tr>
<td><strong>FABOPHYSICALACTIVITY</strong></td>
<td>14.41</td>
<td>13.51</td>
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596
<table>
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<tr>
<th>Metric</th>
<th>Value 1</th>
<th>Value 2</th>
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</thead>
<tbody>
<tr>
<td>5% Trimmed Mean</td>
<td>14.61</td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>16.00</td>
<td></td>
</tr>
<tr>
<td>Variance</td>
<td>41.016</td>
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</tr>
<tr>
<td>Std. Deviation</td>
<td>6.404</td>
<td></td>
</tr>
<tr>
<td>Minimum</td>
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</tr>
<tr>
<td>Maximum</td>
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<td></td>
</tr>
<tr>
<td>Range</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>Interquartile Range</td>
<td>10</td>
<td></td>
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<tr>
<td>Skewness</td>
<td>-.507</td>
<td>.172</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-.841</td>
<td>.342</td>
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</table>

<table>
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<tr>
<th>Metric</th>
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<tbody>
<tr>
<td>FABQWORKSUBSCALE Mean</td>
<td>24.89</td>
<td>.750</td>
</tr>
<tr>
<td>95% Confidence Interval for Mean</td>
<td>Lower Bound 23.41</td>
<td>Upper Bound 26.37</td>
</tr>
<tr>
<td>5% Trimmed Mean</td>
<td>25.26</td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>28.00</td>
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<tr>
<td>Variance</td>
<td>112.430</td>
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<tr>
<td>Std. Deviation</td>
<td>10.603</td>
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<td>Minimum</td>
<td>1</td>
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<tr>
<td>Maximum</td>
<td>42</td>
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</tr>
<tr>
<td>Range</td>
<td>41</td>
<td></td>
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<tr>
<td>Interquartile Range</td>
<td>19</td>
<td></td>
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<tr>
<td>Skewness</td>
<td>-.497</td>
<td>.172</td>
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<td>Kurtosis</td>
<td>-.977</td>
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<th>Value 2</th>
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<tr>
<td>FABQTOTAL Mean</td>
<td>39.22</td>
<td>1.125</td>
</tr>
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<td>95% Confidence Interval for Mean</td>
<td>Lower Bound 37.00</td>
<td>Upper Bound 41.44</td>
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<tr>
<td>5% Trimmed Mean</td>
<td>39.74</td>
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<td>Median</td>
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<td>Variance</td>
<td>253.067</td>
<td></td>
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<tr>
<td>Std. Deviation</td>
<td>15.908</td>
<td></td>
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<td></td>
</tr>
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<td>Interquartile Range</td>
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<td>Skewness</td>
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<td>.342</td>
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</table>

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<thead>
<tr>
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<th>Value 2</th>
</tr>
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<tbody>
<tr>
<td>BPSTOTAL Mean</td>
<td>6.64</td>
<td>.259</td>
</tr>
<tr>
<td>95% Confidence Interval for Mean</td>
<td>Lower Bound 6.12</td>
<td>Upper Bound 7.15</td>
</tr>
<tr>
<td>5% Trimmed Mean</td>
<td>6.54</td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>6.50</td>
<td></td>
</tr>
<tr>
<td>Variance</td>
<td>13.459</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>3.669</td>
<td></td>
</tr>
<tr>
<td>Minimum</td>
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<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>15</td>
<td></td>
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<tr>
<td>Interquartile Range</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Skewness</td>
<td>-.241</td>
<td>.172</td>
</tr>
<tr>
<td>Kurtosis</td>
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<td>.342</td>
</tr>
<tr>
<td>ORFQ TOTALSCORES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>4.55</td>
<td>.330</td>
</tr>
<tr>
<td>95% Confidence Interval for Mean</td>
<td>3.89</td>
<td>5.20</td>
</tr>
<tr>
<td>5% Trimmed Mean</td>
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<td></td>
</tr>
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<td></td>
</tr>
<tr>
<td>Variance</td>
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<td></td>
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<tr>
<td>Std. Deviation</td>
<td>4.668</td>
<td></td>
</tr>
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<td></td>
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<td>Maximum</td>
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<td></td>
</tr>
<tr>
<td>Range</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Interquartile Range</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Skewness</td>
<td>1.739</td>
<td>.172</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>2.602</td>
<td>.342</td>
</tr>
</tbody>
</table>
APPENDIX 22: SOME MAPS
APPENDIX 23: PERMISSION FROM TRADITIONAL HEADS

‘Biopsychosocial determinants of disability in rural community dwelling adults with non-specific chronic low back pain in rural Nigeria’

Dear Sir,

We seek your permission to announce and conduct the above named study (supervised by Dr Emma Godfrey, Dr Isaac Sorinola, Prof Sheila Kitchen and Prof Chika Onwasigwe) in your community; a study within a PhD at King’s College London, University of London aimed at developing an intervention for non-specific chronic low back pain in rural Nigeria.

Attached is the information sheet about this study for further information.

Igwesi-Chidobe Chinonso N

(PhD candidate)

Traditional ruler’s (or rep) name, signature & date
APPENDIX 24: ORIGINAL ENGLISH MEASURES

INTRODUCTION: The aim of this research is to understand factors that are associated with back pain in order to inform the development of an intervention for it in rural Nigeria. It is therefore essential that you give us very accurate information. Please note that no answer is right or wrong, what is important is that you tell us the truth. Everything discussed today is completely confidential and will NOT be disclosed to anyone.

Then show document signed by the traditional head of the village explaining the study

SCREENING: RED FLAGS

Do you have weakness, heaviness or paralysis of your legs or any part of your body?

Do you have difficulty controlling your urine or faeces?

Do you lack sensation anywhere in your body (if yes probe to determine if it is around the buttocks or private part)?

Have you had fever or any illness or been admitted in the hospital recently?

Have you had a fall or any accident recently?

Have you lost weight recently?

Is your pain worse when you are lying on your back or at night?

Are you 70 years or above?

Have you ever had cancer?

Have you been on drugs or are you currently on any drugs? For what?

Do you have wounds anywhere on your body?

INCLUDE SOMEONE NEGATIVE TO ALL OF THE ABOVE AND IN ADDITION IS:

Aged 18 to 70 years, with back pain lasting for more than 12 weeks.

Not pregnant
Can hear well, speak well, and is coherent

General demographic question

What is your religion and denomination?

........................................................................................................................................................................

**TYPOED MEASURES FOR CROSS-CULTURAL ADAPTATION**

**WHODAS 2.0 36-ITEM VERSION,**

**INTERVIEWER-ADMINISTERED** (World Health Organisation Disability Assessment Schedule)

*Instructions to the interviewer are written in bold and italics-do not read these aloud.*

*Text for the respondent to hear is written in standard print in blue.*

*Read this text aloud*

**Section 1: Face sheet**

<table>
<thead>
<tr>
<th>Complete</th>
<th>F1-F5 before</th>
<th>starting each interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>items</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F1</td>
<td>Respondent identity number</td>
<td></td>
</tr>
<tr>
<td>F2</td>
<td>Interviewer identity number</td>
<td></td>
</tr>
<tr>
<td>F3</td>
<td>Assessment time point (1, 2, etc.)</td>
<td></td>
</tr>
<tr>
<td>F4</td>
<td>Interview date</td>
<td>Day...............</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F5</td>
<td>Living situation at time of interview (circle only one)</td>
<td>Independent in community</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assisted living</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hospitalised</td>
</tr>
</tbody>
</table>
Section 2: Demographic and background information

This interview has been developed by the World Health Organisation (WHO) to better understand the difficulties people may have due to their health conditions. The information that you provide in this interview is confidential and will be used only for research. The interview will take 15-20 minutes to complete.

*For respondents from the general population (not the clinical population) say:*

Even if you are healthy and have no difficulties, I need to ask all of the questions so that the survey is complete.

I will start with some background questions.

<table>
<thead>
<tr>
<th>Question</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Record sex as observed</td>
</tr>
<tr>
<td>A2</td>
<td>How old are you now?</td>
</tr>
<tr>
<td>A3</td>
<td>How many years in all did you spend studying in school, college or university?</td>
</tr>
<tr>
<td>A4</td>
<td>What is your current marital status? (select the single best option)</td>
</tr>
<tr>
<td></td>
<td>Currently married</td>
</tr>
<tr>
<td></td>
<td>Separated</td>
</tr>
<tr>
<td></td>
<td>Divorced</td>
</tr>
<tr>
<td></td>
<td>Widowed</td>
</tr>
<tr>
<td></td>
<td>Cohabiting</td>
</tr>
<tr>
<td>A5</td>
<td>Which describes your main work status best? (select the single best option)</td>
</tr>
</tbody>
</table>
Section 3: Preamble

Say to respondent:

The interview is about difficulties people have because of health conditions like back pain.

Hand flashcard to #1 to respondent and say:

By health conditions, I mean all your back related problems that have been on for more than 3 months.

Remember to keep all your back pain problems in mind as you answer the questions. When I ask you about difficulties in doing an activity think about...

Point to flashcard #1 and explain that ‘difficulty with an activity’ means:

- Increased effort
- Discomfort or pain
- Slowness
- Changes in the way you do the activity
**Say to respondent:**

When answering, I’d like you to think back over the past 30 days. I would like you to answer these questions thinking about how much difficulty you have had, on average, over the past 30 days, while doing the activity as you usually do it.

**Hand flashcard #2 to respondent and say:**

Use this scale when responding.

**Read the scale aloud:**

None, mild, moderate, severe, extreme, or cannot do.

Ensure that the respondent can easily see the flashcards #1 and #2 throughout the interview

**Section 4: Domain reviews**

**Domain 1: Cognition**

I am now going to ask some questions about understanding and communicating.

**Show flashcards #1 and #2 to respondent**

<table>
<thead>
<tr>
<th>In the past 30 days, how much difficulty did you have in:</th>
<th>None</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
<th>Extreme or cannot do</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>D1.1</strong> Concentrating on doing something for ten minutes?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><strong>D1.2</strong> Remembering to do important things?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><strong>D1.3</strong> Analysing and finding solutions to problems in day-to-day life?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><strong>D1.4</strong> Learning a new task, for example, learning how to get to a new place?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
D1.5 | **Generally understanding what people say?** | 1 | 2 | 3 | 4 | 5
---|---|---|---|---|---
D1.6 | **Starting and maintaining a conversation?** | 1 | 2 | 3 | 4 | 5

**Domain 2: Mobility**

I am now going to ask you about difficulties in **getting around**.

*Show flashcards #1 and #2*

<table>
<thead>
<tr>
<th>In the past 30 days, how much difficulty did you have in:</th>
<th>None</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
<th>Extreme or cannot do</th>
</tr>
</thead>
</table>
D2.1 | **Standing for long periods such as 30 minutes?** | 1 | 2 | 3 | 4 | 5 |
D2.2 | **Standing up from sitting down?** | 1 | 2 | 3 | 4 |
D2.3 | **Moving around inside your home?** | 1 | 2 | 3 | 4 | 5 |
D2.4 | **Getting out of your home?** | 1 | 2 | 3 | 4 | 5 |
D2.5 | **Walking a long distance such as kilometre (or equivalent)?** | 1 | 2 | 3 | 4 | 5 |

**Domain 3: Self-care**

I am now going to ask you about difficulties in **taking care of yourself**.

*Show flashcards #1 and #2*
In the past 30 days, how much difficulty did you have in:

<table>
<thead>
<tr>
<th>Domain</th>
<th>Question</th>
<th>None</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
<th>Extreme or cannot do</th>
</tr>
</thead>
<tbody>
<tr>
<td>D3.1</td>
<td>Washing your whole body?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>D3.2</td>
<td>Getting dressed?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>D3.3</td>
<td>Eating?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>D3.4</td>
<td>Staying by yourself for a few days?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Domain 4: Getting along with people

I am now going to ask you about difficulties in getting along with people. Please remember that I am asking only about difficulties that are due to your back pain. By this I mean only the problems associated with your back pain.

Show flashcards #1 and #2

<table>
<thead>
<tr>
<th>Domain</th>
<th>Question</th>
<th>None</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
<th>Extreme or cannot do</th>
</tr>
</thead>
<tbody>
<tr>
<td>D4.1</td>
<td>Dealing with people you do not know?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>D4.2</td>
<td>Maintaining a friendship?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>D4.3</td>
<td>Getting along with people who are close to you?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>D4.4</td>
<td>Making new friends?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>D4.5</td>
<td>Sexual activities?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Domain 5: Life activities

5(1): Household activities

I am now going to ask you about activities involved in maintaining your household, and in caring for the people who live with or are close to. These activities include cooking, cleaning, shopping, caring for others and caring for your belongings.

*Show flashcards #1 and #2*

<table>
<thead>
<tr>
<th>Because of your back pain, in the past 30 days, how much difficulty did you have in:</th>
<th>None</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
<th>Extreme or cannot do</th>
</tr>
</thead>
<tbody>
<tr>
<td>D5.1 Taking care of your household responsibilities?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>D5.2 Doing your most important household tasks well?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>D5.3 Getting all the household work done that you needed to do?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>D5.4 Getting your household work done as quickly as needed?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

*If any of the responses to D5.2-D5.5 are rated greater than none (coded as “1”), ask:*

| D5.01 In the past 30 days, on how many days did you reduce or completely miss household work because of your back pain? | Record number of days........ |
If the respondent works (paid, non-paid, self-employed) or goes to school, complete questions D5.5-D5.10 on the next page. Otherwise, skip to D6.1 on the following page.

5(2): Work or school activities

Now I will ask some questions about your work or school activities

*Show flashcards #1 and #2*

<table>
<thead>
<tr>
<th>Because of your back pain, in the past 30 days, how much difficulty did you have in:</th>
<th>None</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
<th>Extreme or cannot do</th>
</tr>
</thead>
<tbody>
<tr>
<td>D5.5 Your day-to-day work/school?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>D5.6 Doing your most important work/school tasks well?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>D5.7 Getting all the work done that you need to do?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>D5.8 Getting your work done as quickly as needed?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>D5.9 Have you had to work at a lower level because of your pain?</td>
<td>No</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
D5.10  Did you earn less as the result of your back pain?  

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

If any of D5.5-D5.8 are rated greater than none (-coded as “1”), ask:

D5.02  In the past 30 days, on how many days did you miss work for half a day or more because of your back pain?  

| Record number of days........ |

Domain 6: Participation

Now, I am going to ask you about your participation in society and the impact of your back pain on you and your family. Some of these questions may involve problems that go beyond the past 30 days, however in answering, please focus on the past 30 days. Again, I remind you to answer these questions while thinking about your back pain.

Show flashcards #1 and #2

<table>
<thead>
<tr>
<th>In the past 30 days:</th>
<th>None</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
<th>Extreme or cannot do</th>
</tr>
</thead>
<tbody>
<tr>
<td>D6.1</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>How much of a problem did you have joining in community activities (for example festivities, religious or other activities) in the same way as anyone else can?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<p>| D6.2                | 1    | 2    | 3        | 4      | 5                   |
|                     | How much of a problem did you have because of |</p>
<table>
<thead>
<tr>
<th>Question</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>D6.3 How much of a problem did you have living with dignity because of attitudes and actions of others?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>D6.4 How much time did you spend on your back pain and its consequences?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>D6.5 How much have you been emotionally affected by your back pain?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>D6.6 How much has your back pain been a drain on the financial resources of you or your family?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>D6.7 How much of a problem did your family have because of your back pain?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>D6.8 How much of a problem did you have in doing things by yourself for relaxation or pleasure?</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
Overall, in the past 30 days, how many days were these difficulties present?  

Record number of days

In the past 30 days, for how many days were you totally unable to carry out your usual activities or work because of your back pain?  

Record number of days

In the past 30 days, not counting the days that you were totally unable, for how many days did you cut back or reduce your usual activities or work because of your back pain?  

Record number of days

This concludes the interview. Thank you for participating.

*WHODAS FLASHCARD 1

Health condition:  
- Back pain

Having difficulty with an activity means:  
- Increased effort  
- Discomfort or pain  
- Slowness  
- Changes in the way you do the activity

Think about the past 30 days only.
*WHODAS FLASHCARD 2

1 2 3 4 5
None Mild Moderate Severe Extreme or cannot do
1. I stay at home most of the time because of my back
2. I change position frequently to try and get my back comfortable
3. I walk more slowly than usual because of my back
4. Because of my back, I am not doing any of the jobs that I usually do around the house
5. Because of my back, I use a handrail to get upstairs
6. Because of my back, I lie down to rest more often.
7. Because of my back, I have to hold on to something to get out of an easy chair.
8. Because of my back, I try to get other people to do things for me.
9. I get dressed more slowly than usual because of my back.
10. I only stand up for short periods of time because of my back
11. Because of my back, I try not to bend or kneel down.
12. I find it difficult to get out of a chair because of my back.
13. My back is painful almost all the time.
14. I find it difficult to turn over in bed because of my back.
15. My appetite is not very good because of my back pain.
16. I have trouble putting on my socks (or stockings) because of the pain in my back.
17. I only walk short distances because of my back pain
18. I sleep less well because of my back
20. I sit down for most of the day because of my back
21. I avoid heavy jobs around the house because of my back.
22. Because of my back pain, I am more irritable and bad tempered with people than usual.
23. Because of my back, I go upstairs more slowly than usual.
24. I stay in bed most of the time because of my back.

Instructions: When your back hurts, you may find it difficult to do some of the things you normally do. This list contains some sentences that people have used to describe themselves when they have back pain. When you read them, you may find that some stand out because they describe you today. As you read the list, think of yourself today. When you read a sentence that describes you today, put a tick against it. If the sentence does not describe you, then leave the space blank and go on to the next one. Remember, only tick the sentence if you are sure that it describes you today.
11-Point box scale (BS-11)

No pain

Pain as bad as it could be
Hospital Anxiety and Depression Scale (HADS)

**A** I feel tense or ‘wound up’:

- Most of the time: 3
- A lot of the time: 2
- From time to time, occasionally: 1
- Not at all: 0

**A** I get a sort of frightened feeling as if something awful is about to happen:

- Very definitely and quite badly: 3
- Yes, but not too badly: 2
- A little, but it doesn’t worry me: 1
- Not at all: 0

**A** Worrying thoughts go through my mind:

- A great deal of the time: 3
- A lot of the time: 2
- Not too often: 1
- Very little: 0

**A** I can sit at ease and feel relaxed:

- Definitely: 0
- Usually: 1
- Not often: 2
- Not at all: 3

**A** I get a sort of frightened feeling like ‘butterflies’ in the stomach:

- Not at all: 0
- Occasionally: 1
- Quite often: 2
- Very often: 3

**D** I still enjoy the things I used to enjoy:

- Definitely as much: 0
- Not quite so much: 1
- Only a little: 2
- Hardly at all: 3

**D** I can laugh and see the funny side of things:

- As much as I always could: 0
- Not quite so much now: 1
- Definitely not so much now: 2
- Not at all: 3

**D** I feel cheerful:

- Not at all: 3
- Not often: 2
- Sometimes: 1
- Most of the time: 0

**D** I have lost interest in my appearance:

- Definitely: 3
- I don’t take as much care as I should: 2
- I may not take quite as much care: 1
- I take just as much care as ever: 0
<table>
<thead>
<tr>
<th>A</th>
<th>I feel restless as if I have to be on the move:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very much indeed</td>
<td>3</td>
</tr>
<tr>
<td>Quite a lot</td>
<td>2</td>
</tr>
<tr>
<td>Not very much</td>
<td>1</td>
</tr>
<tr>
<td>Not at all</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D</th>
<th>I look forward with enjoyment to things:</th>
</tr>
</thead>
<tbody>
<tr>
<td>As much as I ever did</td>
<td>0</td>
</tr>
<tr>
<td>Rather less than I used to</td>
<td>1</td>
</tr>
<tr>
<td>Definitely less than I used to</td>
<td>2</td>
</tr>
<tr>
<td>Hardly at all</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A</th>
<th>I get sudden feelings of panic:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very often indeed</td>
<td>3</td>
</tr>
<tr>
<td>Quite often</td>
<td>2</td>
</tr>
<tr>
<td>Not very often</td>
<td>1</td>
</tr>
<tr>
<td>Not at all</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D</th>
<th>I can enjoy a good book or radio or TV program:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Often</td>
<td>0</td>
</tr>
<tr>
<td>Sometimes</td>
<td>1</td>
</tr>
<tr>
<td>Not often</td>
<td>2</td>
</tr>
<tr>
<td>Very seldom</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D</th>
<th>I feel as if I am slowed down:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nearly all the time</td>
<td>3</td>
</tr>
<tr>
<td>Very often</td>
<td>2</td>
</tr>
<tr>
<td>Sometimes</td>
<td>1</td>
</tr>
<tr>
<td>Not at all</td>
<td>0</td>
</tr>
</tbody>
</table>

**TOTAL SCORING OF ANXIETY AND DEPRESSION:** Add the A=Anxiety; add the D=Depression; 0-7=Normal; 8-10=mild; 11-14= moderate; 15-21=severe

**ALTERNATIVE SCORING:**
0-7=Normal;
8-10=Borderline abnormal;
11-21=Abnormal
# PAIN COPING STRATEGIES QUESTIONNAIRE

Instructions: Individuals who experience pain have developed a number of ways to cope or deal with their pain. These include saying things to themselves when they experience pain, engaging in different activities. Below is a list of things that patients have reported doing when they feel pain. For each activity, please indicate, using the scale below, how much you engage in that activity when you feel pain, where 0 indicates you NEVER do that when you are experiencing pain, a 3 indicates you SOMETIMES do that when you are experiencing pain, and a 6 indicates you ALWAYS do that when you are experiencing pain. Remember, you can use any point along the scale.

<table>
<thead>
<tr>
<th>NEVER</th>
<th>SOMETIMES</th>
<th>ALWAYS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When I feel pain...

1. I try to feel distant from the pain, almost as if the pain was in someone else’s body.
2. I leave the house and do something, such as going to the movies or shopping
3. I try to think of something pleasant
4. I don’t think of it as pain but rather as a dull or warm feeling
5. It’s terrible and I feel it’s never going to get any better
6. I tell myself to be brave and carry on despite the pain
7. I read
8. I tell myself I can overcome the pain
9. I count numbers in my head or run a song through my mind
10. I just think of it as some other sensation such as numbness
11. It’s awful and I feel it overwhelms me
12. I play mental games with myself to keep my mind off the pain
13. I feel my life isn’t worth living
14. I know someday someone will be here to help me and it will go away for awhile
15. I pray to God it won’t last long
16. I try not to think of it as my body, but rather as something separate from me
17. I don’t think about the pain
18. I try to think years ahead, what everything will be like after I’ve gotten rid of the pain
19. I tell myself it doesn’t hurt
20. I tell myself I can’t let the pain stand in the way of what I have to do
21. I don’t pay any attention to it
22. I have faith in doctors that someday there will be a cure for my pain
23. No matter how bad it gets, I know I can handle it
24. I pretend it’s not there
25. I worry all the time whether it will end
26. I replay in my mind pleasant experiences in the past
27. I think of people I enjoy doing things with
28. I pray for the pain to stop
29. I imagine that the pain is outside of my body
30. I just go on as if nothing happened
31. I see it as a challenge and don’t let it bother me
32. Although it hurts, I just keep on going
33. I feel I can’t stand it anymore
34. I try to be around other people
35. I ignore it
36. I rely on my faith in God
37. I feel like I can’t go on
38. I think of things I enjoy doing
39. I do anything to get my mind off the pain
40. I do something I enjoy, such as watching TV or listening to music
41. I pretend it’s not a part of me
42. I do something active, like household chores or projects

Based on all the things you do to cope or deal with your pain, on an average day, how much control do you feel you have over it? Please circle the appropriate number. Remember, you can circle any number along the scale.

0 1 2 3 4 5 6
No control Some control Complete control

Based on all the things you do to cope or deal with your pain, on an average day, how much are you able to decrease it? Please circle the appropriate number. Remember, you can circle any number along the scale.

0 1 2 3 4 5 6
Can’t Decrease Can decrease it Can decrease it it at all somewhat completely
MULTIDIMENSIONAL SCALE OF PERCEIVED SOCIAL SUPPORT

Instructions: We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement. Circle the ‘1’ if you very strongly disagree Circle the ‘2’ if you strongly disagree Circle the ‘3’ if you mildly disagree Circle the ‘4’ if you are neutral Circle the ‘5’ if you mildly agree Circle the ‘6’ if you strongly agree Circle the ‘7’ if you very strongly agree

1. There is a special person who is around when I am in need

2. There is a special person with whom I can Share my joys and sorrows

3. My family really tries to help me

4. I get emotional help and support I need from my family

5. I have a special person who is a real source of comfort to me

6. My friends really try to help me

7. I can count on my friends when things go wrong

8. I can talk about my problems with my family

9. I have friends with whom I can share my joys and sorrows

10. There is a special person in my life who cares About my feelings

11. My family is willing to help me make decisions
The items tended to divide into four factor groups relating to the source of the social support, namely family (Fam), friends (Fri) or significant other (SO).

**OCCUPATIONAL RISK FACTOR QUESTIONNAIRE**

Please describe the main tasks of your job

...................................................................................................................................................................

......

Please check yes or no for each of the following

1. Can you usually take breaks in your job in addition to the scheduled breaks?
   Yes  No

2. Do you often find that you cannot work because of unexpected events such as machine break down or material not delivered?
   Yes  No

3. Can you usually control the order and pace of your tasks?  Yes  No

4. Is the order and pace of your tasks usually dependent on others (machines, computers, customers)  Yes  No

5. Do you usually work under time pressure and deadlines?  Yes  No

**How much time do you spend doing the following at work, sitting and/or standing**

6. Bending the trunk forward slightly, hands above knee level
   Almost never  about 10% of the time  about 25% of the time  half the time  about 75% of the time  almost all the time

7. Bending the trunk forward, hands below knee height
   Almost never  about 10% of the time  about 25% of the time  half the time  about 75% of the time  almost all the time
8. Twisting the trunk (over 45 degrees) and bending sideways
Almost never  about 10% of the time  about 25% of the time  half the time  about 75% of the time  almost all the time

**How much time do you spend doing the following at work (circle the box with the right time for every item)**

1. Handling large and bulky objects at arms length
Almost never  about 10% of the time  about 25% of the time  half the time  about 75% of the time  almost all the time

2. Carrying loads with one hand
Almost never  about 10% of the time  about 25% of the time  half the time  about 75% of the time  almost all the time

3. Handling objects difficult to grip-unstable, no handles
Almost never  about 10% of the time  about 25% of the time  half the time  about 75% of the time  almost all the time

4. Pushing/pulling loads (carts, drawers)
Almost never  about 10% of the time  about 25% of the time  half the time  about 75% of the time  almost all the time

5. Carrying objects of 10-30 lb
Almost never  about 10% of the time  about 25% of the time  half the time  about 75% of the time  almost all the time

6. Carrying objects of more than 30 lb
Almost never  about 10% of the time  about 25% of the time  half the time  about 75% of the time  almost all the time

7. Carrying loads over 10 lb more than 40 ft
Almost never  about 10% of the time  about 25% of the time  half the time  about 75% of the time  almost all the time

8. Sitting
Almost never  about 10% of the time  about 25% of the time  half the time  about 75% of the time  almost all the time
9. Kneeling or squatting
Almost never  about 10% of the time  about 25% of the time  half the time  about 75% of the time  almost all the time

10. Climbing stairs or ladders
Almost never  about 10% of the time  about 25% of the time  half the time  about 75% of the time  almost all the time

11. Operating powered hand tools (drills, saws, jack hammers)
Almost never  about 10% of the time  about 25% of the time  half the time  about 75% of the time  almost all the time

12. Driving or riding motor vehicles (trucks, buses, trains, forklifts)
Almost never  about 10% of the time  about 25% of the time  half the time  about 75% of the time  almost all the time

13. Working on slippery or uneven surfaces
Almost never  about 10% of the time  about 25% of the time  half the time  about 75% of the time  almost all the time

14. Working on elevated surfaces (scaffold, ladder, catwalk, cherry-picker, roof)
Almost never  about 10% of the time  about 25% of the time  half the time  about 75% of the time  almost all the time

How often do you have to lift an object that weighs:

15. Less than 10lb
Almost never  less than once an hour  1-10 times an hour  11-30 times an hour  over 30 times an hour.

16. 10-30 lb
Almost never  less than once an hour  1-10 times an hour  11-30 times an hour  over 30 times an hour.

17. More than 30 lb
Almost never  less than once an hour  1-10 times an hour  11-30 times an hour  over 30 times an hour.

Thank you for your time!
THE BRIEF ILLNESS PERCEPTION QUESTIONNAIRE

1. How much does your back pain affect your life?

0 1 2 3 4 5 6 7 8 9 10
No affect at all severely affects my life

2. How long do you think your illness will continue?

0 1 2 3 4 5 6 7 8 9 10
A very short time forever

3. How much control do you feel you have over your illness?

0 1 2 3 4 5 6 7 8 9 10
Absolutely no control extreme amount of control

4. How much do you think your treatment can help your illness?

0 1 2 3 4 5 6 7 8 9 10
Not at all extremely helpful

5. How much do you experience symptoms from your illness?

0 1 2 3 4 5 6 7 8 9 10
No symptoms at all many severe symptoms

6. How concerned are you about your illness?

0 1 2 3 4 5 6 7 8 9 10
Not at all concerned extremely concerned

7. How well do you feel you understand your illness?

0 1 2 3 4 5 6 7 8 9 10
Don’t understand Understand very clearly

8. How much does your illness affect you emotionally? (e.g. does it make you angry, scared, upset or depressed?)

0 1 2 3 4 5 6 7 8 9 10
Not at all affected extremely affected emotionally

9. Please list in rank-order the three most important factors that you believe caused your back pain. The most important causes for me:

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
FEAR AVOIDANCE BELIEFS QUESTIONNAIRE (FABQ)

**Purpose:** The FABQ was developed by Waddell to investigate fear-avoidance beliefs among LBP patients in the clinical setting. This survey can help predict those that have a high pain avoidance behavior. Clinically, these people may need to be supervised more than those that confront their pain.

**Scoring:** The FABQ consists of 2 subscales, which are reflected in the division of the outcome form into 2 separate sections. The first subscale (items 1-5) is the Physical Activity subscale (FABQPA), and the second subscale (items 6-16) is the Work subscale (FABQW). Interestingly, not all items contribute to the score for each subscale; however the patient should still complete all items as these items were included when the reliability and validity of the scale was initially established. A low FABQW score (less than 19) was one of 5 variables in a clinical prediction rule that increased the probability of success from SI region manipulation in individuals with low back pain. Each subscale is graded separately by summing the responses respective scale items (0 – 6 for each item); for scoring purposes, only 4 of the physical activity scale items are scored (24 possible points) and only 7 of the work items (42 possible points). The method to score each subscale is outlined below. (Note: It is extremely important to ensure all items are completed, as there is no procedure to adjust for incomplete items.)

**Scoring the Physical Activity subscale (FABQPA)**
Sum items 2, 3, 4, and 5 (the score circled by the patient for these items).

**Scoring the Work subscale (FABQW)**
Sum items 6, 7, 9, 10, 11, 12, and 15.

**Measurement Characteristics:** The FABQ has been demonstrated to be valid and reliable in a chronic LBP population and appears to be a useful screening tool for identifying acute LBP patients who will not return to work by 4wks.
Here are some of the things which other patients have told us about their pain. For each statement please circle any number from 0 to 6 to say how much physical activities such as bending, lifting, walking or driving affect or would affect your back pain.

COMPLETELY UNSURE COMPLETELY DISAGREE AGREE
1. My pain was caused by physical activity 0 1 2 3 4 5 6
2. Physical activity makes my pain worse 0 1 2 3 4 5 6
3. Physical activity might harm my back 0 1 2 3 4 5 6
4. I should not do physical activities 0 1 2 3 4 5 6 which (might) make my pain worse
5. I cannot do physical activities which 0 1 2 3 4 5 6 (might) make my pain worse

The following statements are about how your normal work affects or would affect your back pain.

COMPLETELY UNSURE COMPLETELY DISAGREE AGREE
6. My pain was caused by my work or by 0 1 2 3 4 5 6 an accident at work
7. My work aggravated my pain 0 1 2 3 4 5 6
8. I have a claim for compensation for my pain 0 1 2 3 4 5 6
9. My work is too heavy for me 0 1 2 3 4 5 6
10. My work makes or would make my pain worse 0 1 2 3 4 5 6
11. My work might harm my back 0 1 2 3 4 5 6
12. I should not do my normal work with my 0 1 2 3 4 5 6 present pain
13. I cannot do my normal work with my 0 1 2 3 4 5 6 present pain
14. I cannot do my normal work until my pain 0 1 2 3 4 5 6 is treated
15. I do not think that I will be back to my 0 1 2 3 4 5 6 normal work within 3 months
16. I do not think that I will ever be able to go 0 1 2 3 4 5 6 back to that work
The patient is to wear loose clothing and no shoes. The activities are explained and demonstrated to the patient. BPS scale: 0-15

<table>
<thead>
<tr>
<th>Tests</th>
<th>Performance</th>
<th>Scoring categories</th>
<th>Scores</th>
</tr>
</thead>
</table>
| Sock test     | The patient is sitting on a high firm bench, the feet not reaching the floor. One leg is tested at the time-the least reach scored. Instruction: can you grab your toes with fingertips of both hands when the leg is flexed in the sagittal plane? | ➢ Can easily grab the toes with fingertips of both hands  
➢ Can grab the toes with fingertips, but with effort  
➢ Can reach beyond the malleoli, but not reach the toes  
➢ Can hardly, if at all, reach as far as to the malleoli | 0  
1  
2  
3 |
| Pick-up test  | The patient is standing on the floor. A curled piece of paper is dropped on the floor. Instruction: can you pick up the paper? Can you do it in different ways showing flexibility of the trunk? | ➢ Can do the task with ease in varied ways  
➢ Can do the task with minor effort or some decreased flexibility  
➢ Can do the task with marked effort or lack of flexibility, may need support of hand on thigh  
➢ Cannot perform the task at all, or need external support | 0  
1  
2  
3 |
| Roll-up test  | The patient is lying supine on a firm mattress or plinth or table Instruction: can you roll up slowly into a long-sitting position, with arms relaxed? | ➢ Can roll up with ease, to a long-sitting position  
➢ Can roll up with marked effort or partially to long-sitting position  
➢ Can roll up in supine position between the 8th and 12th thoracic vertebra  
➢ Can roll up in supine position above the 8th thoracic vertebra | 0  
1  
2  
3 |
| Finger        | The patient is standing on the floor, feet 10cm apart and knees straight.     | ➢ Can reach to the floor, distance=0 cm  
➢ Can reach to a distance > 0 cm, ≤ 20cm | 0  
1  
2 |
<table>
<thead>
<tr>
<th>Test</th>
<th>Instruction: Can you reach as far as possible to the floor?</th>
<th>Can reach to a distance &gt; 20cm, ≤ 40cm</th>
<th>Can reach to a distance &gt; 40cm</th>
<th>BPS sum score</th>
</tr>
</thead>
<tbody>
<tr>
<td>tip-to floor test</td>
<td></td>
<td>➢</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Lift test</td>
<td>The patient is standing on the floor in front of a table. Instruction: Can you repeat lifting this box, containing a sandbag of 5kg, for 1 minute, from the floor to the table (height 76 cm) and back to the floor using an optional technique. The box, with grip: 1.35 kg, sized 0.36 x 0.36 x 0.25 cm.</td>
<td>➢ Can do the lifting task &gt; 15 times</td>
<td>➢ Can do the lifting task &gt; 10, ≤ 15 times</td>
<td>0 1 2 3</td>
</tr>
</tbody>
</table>
APPENDIX 25: ACCURACY OF MULTIPLE REGRESSION MODELS

<table>
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The high values of tolerance and low values of VIF show that there is no multicollinearity.
The points are reasonably close to a straight line hence normality is assumed.
A scatterplot of ZRESID (standardized residuals) and ZPRED (standardised predicted values) approximately forms a rectangle across the middle of the graph, hence assumptions of normality, linearity, and homoscedasticity of residuals are met.

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The high values of tolerance and low values of VIF show that there is no multicollinearity.
The points are reasonably close to a straight line hence normality is assumed.
A scatterplot of ZRESID (standardized residuals) and ZPRED (standardised predicted values) approximately forms a rectangle across the middle of the graph, hence assumptions of normality, linearity, and homoscedasticity of residuals are met.

STANDARDISED RESIDUALS FOR THE PREDICTED RMDQ FOR THE 200 CASES

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APPENDIX 26: COLLINEARITY DIAGNOSTICS (BIPQ)

Table 10: Collinearity diagnostics of the items in the brief illness perceptions measure

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<td>BIPQ6</td>
<td>.422</td>
<td>2.367</td>
<td>BIPQ2</td>
<td>.950</td>
<td>1.053</td>
</tr>
<tr>
<td>BIPQ7</td>
<td>.723</td>
<td>1.384</td>
<td>BIPQ3</td>
<td>.703</td>
<td>1.422</td>
</tr>
<tr>
<td>BIPQ8</td>
<td>.408</td>
<td>2.452</td>
<td>BIPQ4</td>
<td>.604</td>
<td>1.657</td>
</tr>
<tr>
<td>BIPQ1</td>
<td>.405</td>
<td>2.470</td>
<td>BIPQ5</td>
<td>.629</td>
<td>1.590</td>
</tr>
<tr>
<td>BIPQ2</td>
<td>.938</td>
<td>1.066</td>
<td>BIPQ6</td>
<td>.512</td>
<td>1.953</td>
</tr>
<tr>
<td>BIPQ3</td>
<td>.896</td>
<td>1.116</td>
<td>BIPQ7</td>
<td>.724</td>
<td>1.381</td>
</tr>
</tbody>
</table>

BIPQ1: Consequences; BIPQ2: Timeline; BIPQ3: Personal control; BIPQ4: Treatment control; BIPQ5: Identity; BIPQ6: Illness concern; BIPQ7: Coherence; BIPQ8: Emotional representation
APPENDIX 27: TESTS OF INTERACTIONS

Table A: Tests of interactions

<table>
<thead>
<tr>
<th>Criterion variables (dependent)</th>
<th>Predictor variables</th>
<th>Interaction terms</th>
<th>B (95% CI)</th>
<th>β</th>
<th>p-values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Igbo-RMDQ</td>
<td>Igbo-ORFQ</td>
<td>ORFQ*MSPSS</td>
<td>ORFQ 1.286 (0.264, 2.309)</td>
<td>0.924</td>
<td>0.014</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Igbo-MSPSS 0.206 (0.110, 0.301)</td>
<td>0.420</td>
<td>P&lt;0.0005</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ORFQ*MSPSS -0.022 (-0.036, -0.009)</td>
<td>-1.269</td>
<td>0.002</td>
</tr>
<tr>
<td>Igbo-ORFQ</td>
<td>ORFQ*HADS-D</td>
<td>ORFQ</td>
<td>ORFQ 0.234 (-0.219, 0.686)</td>
<td>0.168</td>
<td>0.310</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Igbo-HADS-D 0.745 (0.442, 1.048)</td>
<td>0.398</td>
<td>P&lt;0.0005</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ORFQ*HADS-D -0.253 (-0.483, -0.023)</td>
<td>-0.368</td>
<td>0.031</td>
</tr>
</tbody>
</table>

p level= 0.05; Bonferroni level of significance= 0.0028 (2-tailed); **RMDQ**: Roland Morris Disability Questionnaire; **HADS-D**: Hospital Anxiety and Depression Scale-Depression subscale; **MSPSS**: Multidimensional Scale of Perceived Social Support; **ORFQ**: Occupational Risk Factor Questionnaire
Table B: Addition of significant interaction terms into the multiple regression analysis that predicted self-reported disability (Igbo-RMDQ)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B (95% CI)</td>
<td>SEB</td>
</tr>
<tr>
<td>Gender (female)</td>
<td>1.732 (-0.6, 3.5)</td>
<td>0.907</td>
</tr>
<tr>
<td>(Male= reference)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.050 (-0.33, 0.13)</td>
<td>0.042</td>
</tr>
<tr>
<td>Education</td>
<td>-0.244 (-0.40, -0.09)</td>
<td>0.079</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(widowed)</td>
<td>2.016 (-0.55, 4.58)</td>
<td>1.302</td>
</tr>
<tr>
<td>(Other marital status= reference)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work status</td>
<td>10.448 (4.48, 16.42)</td>
<td>3.029</td>
</tr>
<tr>
<td>(unemployed-health reasons)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(other work status= reference)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain (11-point box scale)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety (HADS)</td>
<td>0.270 (0.09, 0.46)</td>
<td>0.094</td>
</tr>
<tr>
<td>Depression (HADS)</td>
<td>-0.296 (-0.54, -0.05)</td>
<td>0.125</td>
</tr>
<tr>
<td>Catastrophizing (CSQ)</td>
<td>0.172 (0.08, 0.27)</td>
<td>0.048</td>
</tr>
<tr>
<td>Illness perceptions (BIPQ)</td>
<td>0.222 (0.15, 0.29)</td>
<td>0.036</td>
</tr>
<tr>
<td>Fear avoidance beliefs (FABQ)</td>
<td>0.078 (0.03, 0.12)</td>
<td>0.023</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>S.E.</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>Occupational biomechanical factors (ORFQ)</td>
<td>-0.219</td>
<td>0.372</td>
</tr>
<tr>
<td></td>
<td>0.106</td>
<td>0.032</td>
</tr>
<tr>
<td></td>
<td>0.127</td>
<td>0.078</td>
</tr>
<tr>
<td>R²</td>
<td>0.202</td>
<td></td>
</tr>
<tr>
<td>R² change</td>
<td>0.202</td>
<td></td>
</tr>
<tr>
<td>F for change in R²</td>
<td>F(5, 194)=9.824**</td>
<td></td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.181</td>
<td></td>
</tr>
</tbody>
</table>

*P<0.05   **p<0.01  2-tailed; B=Unstandardized; β=Standardized
APPENDIX 28: SEARCH STRATEGIES

Appendix: Search strategy

MEDLINE (OvidSP)
1. exp Pain/
2. Pain measurement/
3. Fibromyalgia/
4. Fatigue syndrome, chronic/
5. (Chronic Pains* or Pains, Chronic* or Pain, Chronic* or Widespread Chronic Pain* or Chronic Pain, Widespread* or Chronic Pains, Widespread* or Pain, Widespread Chronic* or Pains, Widespread Chronic* or Widespread Chronic Pains*). mp
6. (Musculoskeletal Pain* or Pelvic girdle pain* or Musculoskeletal Pains* or Pain, Musculoskeletal* or Pains, Musculoskeletal* or Myalgia*). mp
7. (Back Pains* or Pain, Back* or Backache* or Backaches* or Back Ache* or Ache, Back* or Aches, Back* or Back Aches* or Back Pain without Radiation* or Vertebrogenic Pain Syndrome* or Pain Syndrome, Vertebrogenic* or Pain Syndromes, Vertebrogenic* or Syndrome, Vertebrogenic Pain* or Syndromes, Vertebrogenic Pain* or Vertebrogenic Pain Syndromes* or Back Pain with Radiation* or Back Pain, Low* or Back Pains, Low* or Low Back Pains* or Pain, Low Back* or Pains, Low Back* or Lumbago* or Lower Back Pain* or Back Pain, Lower* or Back Pains, Lower* or Lower Back Pains* or Pain, Lower Back* or Low Back Ache* or Ache, Low Back* or Aches, Low Back* or Back Ache, Low* or Back Aches, Low* or Low Back Aches* or Low Backache* or Backache, Low* or Backaches, Low* or Low Backaches* or Low Back Pain, Recurrent* or Recurrent Low Back Pain* or Low Back Pain, Postural* or Postural Low Back Pain* or Low Back Pain, Mechanical* or Mechanical Low Back Pain* or Low Back Pain, Posterior Compartment*). mp
8. (Metatarsalgia* or Foot diseases*). mp
9. (Neck Pains* or Pain, Neck* or Pains, Neck* or Neckache* or Neckaches* or Cervicodynia* or Cervicodynias* or Neck Ache* or Ache, Neck* or Aches, Neck* or Neck Aches* or Cervical Pain* or Cervical Pains* or Pain, Cervical* or Pains, Cervical* or Cervicalgia* or Cervicalgias* or Posterior Cervical Pain* or Cervical Pain, Posterior* or Cervical Pains, Posterior* or Pain, Posterior Cervical* or Pains, Posterior Cervical* or Posterior Cervical Pains* or Posterior Neck Pain* or Neck Pain, Posterior* or Neck Pains, Posterior* or Pain, Posterior Neck* or Pains, Posterior Neck* or Posterior Neck Pains* or Anterior Cervical Pain* or Anterior Cervical Pains* or Anterior Cervical Pain* or Cervical Pain, Anterior* or Cervical Pains, Anterior* or Pain, Anterior Cervical* or Pains, Anterior Cervical* or Anterior Neck Pain* or Anterior Neck Pains* or Neck Pain, Anterior* or Neck Pains, Anterior* or Pain, Anterior Neck* or Pains, Anterior Neck*). mp
10. (Neuralgias* or Neuropathic Pain* or Neuropathic Pains* or Pain, Neuropathic* or Pains, Neuropathic* or Neurodynia* or Neurodynias* or Neuralgia, Atypical* or Atypical Neuralgia* or Atypical Neuralgias* or Neuralgias, Atypical* or Neuralgia, Iliohypogastric Nerve* or Iliohipogastric Nerve Neuralgia* or Iliohypogastric Nerve Neuralgias* or Nerve Neuralgia, Iliohipogastric* or Nerve Neuralgias, Iliohipogastric* or Neuralgias,
Iliohypogastric Nerve* or Paroxysmal Nerve Pain* or Nerve Pain, Paroxysmal* or Nerve Pains, Paroxysmal* or Pain, Paroxysmal Nerve* or Pains, Paroxysmal Nerve* or Paroxysmal Nerve Pains* or Neuralgia, Perineal* or Neuralgias, Perineal* or Perineal Neuralgia* or Perineal Neuralgias* or Neuralgia, Stump* or Neuralgias, Stump* or Stump Neuralgia* or Stump Neuralgias* or Neuralgia, Supraorbital* or Neuralgias, Supraorbital* or Supraorbital Neuralgia* or Supraorbital Neuralgias* or Neuralgia, Vidian* or Neuralgias, Vidian* or Vidian Neuralgia* or Vidian Neuralgias* or Nerve Pain* or Nerve Pains* or Pain, Nerve* or Pains, Nerve* or Neuralgia, Ilioinguinal* or Ilioinguinal Neuralgia* or Ilioinguinal Neuralgias* or Neuralgias, Ilioinguinal*). mp

11. (Nociceptive Pains* or Pain, Nociceptive* or Pains, Nociceptive* or Tissue Pain* or Pain, Tissue* or Pains, Tissue* or Tissue Pains* or Somatic Pain* or Pain, Somatic* or Pains, Somatic or Somatic Pains*). mp

12. (Arthralgias* or Joint Pain* or Joint Pains* or Pain, Joint* or Pains, Joint* or Polyarthralgia* or Polyarthralgias*). mp

13. (Pain, Shoulder* or Pains, Shoulder* or Shoulder Pains*). mp

14. (Sciatic Neuralgia* or Neuralgia, Sciatic* or Neuralgias, Sciatic* or Sciatic Neuralgias* or Sciatica, Bilateral* or Bilateral Sciatica* or Bilateral Sciaticas*). mp

15. (Pain, Pelvic* or Pains, Pelvic* or Pelvic Pains*). mp

16. (Fibromyalgia* or Fatigue syndrome* or Chronic Fatigue Disorder* or Chronic Fatigue Disorders* or Disorders, Chronic Fatigue* or Fatigue Disorder, Chronic* or Fatigue Disorders, Chronic* or Chronic Fatigue-Fibromyalgia Syndrome* or Chronic Fatigue Fibromyalgia Syndrome* or Chronic Fatigue-Fibromyalgia Syndromes* or Fatigue-Fibromyalgia Syndrome, Chronic* or Fatigue- Fibromyalgia Syndromes, Chronic* or Syndrome, Chronic Fatigue-Fibromyalgia* or Syndromes, Chronic Fatigue-Fibromyalgia* or Myalgic Encephalomyelitis* or Encephalomyelitis, Myalgic* or Royal Free Disease* or Fatigue Syndrome, Postviral* or Fatigue Syndromes, Postviral* or Postviral Fatigue Syndromes* or Syndromes, Postviral Fatigue* or Postviral Fatigue Syndrome* or Infectious Mononucleosis-Like Syndrome, Chronic* or Infectious Mononucleosis Like Syndrome, Chronic* or Chronic Fatigue and Immune Dysfunction Syndrome* or Chronic Fatigue Syndrome* or Chronic Fatigue Syndromes* or Fatigue Syndromes, Chronic*). mp

17. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16

18. exp Hypertension/

19. exp blood pressure/

20. hypertens$.tw.

21. bloodpressure.tw.

22. ((elevat$ or high$ or rais$) adj3 (diastolic or systolic or arterial or blood) adj pressure).tw.

23. (((((((((((hyperten* or Hypertension* or Hypertensive* or high blood) adj5 pressure*) or High blood pressure* or high BP* or HBP* or hyperpiesia*, hypertonia*, cardiovascular* or cardiovascular*) adj5 disease$) or cardiovascular* or cardiovascular*) adj5 condition$) or elevate$ blood pressure* or increase$) adj3 blood pressure*) or essential hypertension* or high) adj3 pressure*) or idiopathic hypertension*, malignant hypertension*, secondary hypertension*).mp.
24. 18 or 19 or 20 or 21 or 22 or 23
25. exp Diabetes mellitus/
26. exp Diabetes insipidus/
27. exp Diabetes complication$/
28. (diabet* or elevate$ adj5 blood sugar* or increas* adj7 sugar* increase$ adj5 blood sugar* or glyc?em$ adj5 control*). mp
29. 25 or 26 or 27 or 28
30. exp Obesity/
31. exp overnutrition/
32. (obes* or weight gain* or weight loss or body mass index or adipos* or overweight or over weight or overload syndrome* or overeat* or over eat* or overfeed* or over feed* or weight cycling or weight reduc* or weight losing or weight maint* or weight decreas* or weight watch* or weight control*). mp
33. 30 or 31 or 32
34. 17 or 24 or 29 or 33
35. exp Africa/
36. Africa, central/
37. Africa, eastern/
38. Africa, southern/
39. Africa, western/
40. South Africa/
41. African filter: Africa/ or Africa* .tw. or Algeria .tw. or Angola .tw. or Benin .tw. or Botswana .tw. or Burkina Faso .tw. or Burundi .tw. or Cameroon .tw. or Canary Islands .tw. or Cape Verde .tw. or Central African Republic .tw. or Chad .tw. or Comoros .tw. or Congo .tw. or Democratic Republic of Congo .tw. or Djibouti .tw. or Egypt .tw. or Equatorial Guinea .tw. or Eritrea .tw. or Ethiopia .tw. or Gabon .tw. or Gambia .tw. or Ghana .tw. or Guinea .tw. or Guinea Bissau .tw. or Ivory Coast .tw. or Cote dIvoire .tw. or Jamahiriya .tw. or Kenya .tw. or Lesotho .tw. or Liberia .tw. or Libya .tw. or Madagascar .tw. or Malawi .tw. or Mali .tw. or Mauritania .tw. or Mauritius .tw. or Mayotte .tw. or Morocco .tw. or Mozambique .tw. or Namibia .tw. or Niger .tw. or Nigeria .tw. or Principe .tw. or Reunion .tw. or Rwanda .tw. or Sao Tome .tw. or Senegal .tw. or Seychelles .tw. or Sierra Leone .tw. or Somalia .tw. or South Africa .tw. or St Helena .tw. or Sudan .tw. or Swaziland .tw. or Tanzania .tw. or Togo .tw. or Tunisia .tw. or Uganda .tw. or Western Sahara .tw. or Zaire .tw. or Zambia .tw. or Zimbabwe .tw. or Central Africa .tw. or Central African .tw. or West Africa .tw. or West African .tw. or Western Africa .tw. or Western African .tw. or East Africa .tw. or East African .tw. or Eastern Africa .tw. or Eastern African .tw. or North Africa .tw. or North African .tw or Northern Africa .tw or South African .tw or Southern Africa .tw or Southern African .tw or sub-Saharan Africa .tw or sub-Saharan African .tw or sub-Saharan African .tw or sub-Saharan Africa .tw or sub-Saharan African .tw or not guinea pig .tw or guinea pigs .tw or aspergillums Niger .tw.
42. 35 or 36 or 37 or 38 or 39 or 40 or 41
43. exp Therapeutics
44. Treatment/
45. exp Psychotherapy/
46. exp Health Services/
47. Preventive health services .mp.
48. Dietary services/
49. Patient care/
50. Rural health services/
51. Urban health services/
52. Rehabilitation/
53. Nursing services/
54. Nursing care/
55. exp Health promotion/
56. exp Behavior Therapy/
57. Social support/
58. Exercise/
59. (Physical education and training).mp.
60. Physical fitness/
61. Health education/
62. Health promotion/
63. Sports/
64. Exertion.mp.
65. Exercise-therapy/
67. Diet therapy/
68. Diabetic diet/
69. Diet therapy/
70. (behavior change* or intervention$ or behavior change* adj5 intervention$ or intervention$ or treatment* or therapy* or therapy* or trial* or effect* or efficacy* or effectiveness*)
71. (exercise* or exertion* or sport* or walking or jogging or swimming or strength train* or resistance train* or aerobic train* or physical education* or physical fitness or training or nutrition* or lifestyle or health* behavior or health* education* or health promotion* or physical activity or bicycling or cycling or weight lifting or gymnastics* or dance* or diet*)
72. (lifestyle or life style) adj (change$ or intervention$).af.
73. (psychological or behavior?r$) adj (therapy or modify$ or strategy$ or intervention$).af.
74. (group therapy or family therapy or cognitive therapy).af.
75. counseling.af
76. social support.af
77. (peer adj2 support).af
78. Clinical trials filter:
"clinical trial".pt. or "clinical trial, phase i".pt. or "clinical trial, phase ii".pt. or clinical trial, phase iii.pt. or clinical trial, phase iv.pt. or controlled clinical trial.pt. or "multicenter study".pt. or "randomized controlled trial".pt. or double-blind method/ or clinical trials as topic/ or clinical trials, phase i as topic/ or clinical trials, phase ii as topic/ or clinical trials, phase iii as topic/ or clinical trials, phase iv as topic/ or controlled clinical trials as topic/ or randomized controlled trials as topic/ or early termination of clinical trials as topic/ or multicenter studies as topic/ or ((randomized adj7 trial*) or (controlled adj3 trial*) or (clinical adj2 trial*) or ((single or double* or triple* or triple*) and (blind* or mask*)).ti,ab.
79. 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56 or 57 or 58 or 59 or 60 or 61 or 62 or 63 or 64 or 65 or 66 or 67 or 68 or 69 or 70 or 71 or 72 or 73 or 74 or 75 or 76 or 77 or 78
80. exp Attitude/
81. exp Behavior/
82. Lifestyle/
83. Health behaviour.mp.
84. Feeding-behavior/
85. 80 or 81 or 82 or 83 or 84
86. qualitative*research* or explor*
87. Qualitative research filter:
(("semi-structured" or semistructured or unstructured or informal or "in-depth" or indepth or "face- to-face" or structured or guide) adj3 (interview* or discussion* or questionnaire*)).ti,ab. or (focus group* or qualitative or ethnograph* or fieldwork or "field work" or "key informant").ti,ab. or interviews as topic/ or focus groups/ or narration/ or qualitative research/
88. 86 or 87
89. Observational studies search filter:
Epidemiologic studies/ or case control studies/ or cohort studies/ or Case control.tw. or (cohort adj (study or studies)).tw. or Cohort analy$.tw. or (Follow up adj (study or studies)).tw. or (observational adj (study or studies)).tw. or Longitudinal.tw. or Retrospective.tw. or Cross sectional.tw. or Cross- sectional studies/
90. 34 AND 42 AND 79 AND 85 (Intervention studies)
91. 34 AND 42 AND 85 AND 88 (Qualitative studies)
92. 34 AND 42 AND 85 AND 89 (Observational studies)
EMBASE (OvidSP)
1. exp pain/
2. exp chronic pain/
3. exp pain assessment/
4. exp fibromyalgia/
5. exp fatigue syndrome/
6. chronic pelvic pain/
7. (chronic pain or complex regional pain syndrome or neuropathic pain or nociceptive pain or ankle pain or arm pain or bone pain or flank pain or foot pain or hand pain or headache and facial pain or heel pain or hip pain or jaw pain or knee pain or leg pain or limb pain or low back pain or inflammatory pain or inguinal pain or musculoskeletal chest pain or musculoskeletal pain or myofascial pain or neck pain or noncardiac chest pain). mp.
8. (patellofemoral pain syndrome or pelvic girdle pain or pelvic pain or pelvis pain syndrome or perineal pain or phantom pain or radicular pain or shoulder pain or disability index or spinal pain or wrist pain). mp.
9. (back Pains* or Pain, Back* or Pains, Back* or Backache* or Backaches* or Back Ache* or Ache, Back* or Aches, Back* or Back Aches* or Back Pain without Radiation* or Vertebrogenic Pain Syndrome* or Pain Syndrome, Vertebrogenic* or Pain Syndromes, Vertebo
   genic* or Syndrome, Vertebo
genic Pain* or Syndromes, Vertebo
genic Pain* or Vertebo
   genic Pain Syndromes* or Back Pain with Radiation* or Back Pain, Low* or Back Pains, Low* or Low Back Pains* or Pain, Low Back* or Pains, Low Back* or Lumbago* or Lower Back Pain* or Lower Back Pains* or Pain, Lower Back* or Low Back Ache* or Ache, Low Back* or Aches, Low Back* or Ache, Low* or Back Aches, Low* or Low Back Aches* or Low Backache* or Backache, Low* or Backaches, Low* or Low Backaches* or Low Back Pain, Recurrent* or Recurrent Low Back Pain* or Low Back Pain, Postural* or Postural Low Back Pain* or Low Back Pain, Mechanical* or Mechanical Low Back Pain* or Low Back Pain, Posterior Compartment*). mp
10. (metatarsalgia* or foot diseases*). mp.
11. (neck Pains* or Pain, Neck* or Pains, Neck* or Neckache* or Neckaches* or Cervicodynia* or Cervicodynas* or Neck Ache* or Ache, Neck* or Aches, Neck* or Neck Aches* or Cervical Pain* or Cervical Pains* or Pain, Cervical* or Pains, Cervical* or Cervicalgia* or Cervicalgias* or Posterior Cervical Pain* or Cervical Pain, Posterior* or Cervical Pains, Posterior* or Pain, Posterior Cervical* or Pains, Posterior Cervical* or Posterior Cervical Pains* or Posterior Neck Pain* or Neck Pain, Posterior* or Neck Pains, Posterior* or Pain, Posterior Neck* or Pains, Posterior Neck* or Posterior Neck Pains* or Anterior Cervical Pain* or Anterior Cervical Pains* or Cervical Pain, Anterior* or Cervical Pains, Anterior* or Pain, Anterior Cervical* or Pains, Anterior Cervical* or Anterior Neck Pain* or Anterior Neck Pains* or Neck Pain, Anterior* or Neck Pains, Anterior* or Pain, Anterior Neck* or Pains, Anterior Neck*). mp.
12. (Neuralgias* or Neuropathic Pain* or Neuropathic Pains* or Pain, Neuropathic* or Pains, Neuropathic* or Neurodynia* or Neurodynias* or Neuralgia, Atypical* or Atypical Neuralgia* or Atypical Neuralgias* or Neuralgias, Atypical* or Neuralgia, Iliohippogastric Nerve* or Iliohippogastric Nerve Neuralgia* or Iliohippogastric Nerve Neuralgias* or Nerve Neuralgia, Iliohippogastric* or Nerve Neuralgias, Iliohippogastric* or Neuralgias, Iliohippogastric Nerve* or Paroxysmal Nerve Pain* or Nerve Pain, Paroxysmal* or Nerve Pains, Paroxysmal* or Pain, Paroxysmal Nerve* or Pains, Paroxysmal Nerve* or Paroxysmal Nerve Pains* or Neuralgia, Perineal* or Neuralgias, Perineal* or Perineal
Neuralgia* or Perineal Neuralgias* or Neuralgia, Stump* or Neuralgias, Stump* or Stump Neuralgia* or Stump Neuralgias* or Neuralgia, Supraorbital* or Neuralgias, Supraorbital* or Supraorbital Neuralgia* or Supraorbital Neuralgias* or Neuralgia, Vidian* or Neuralgias, Vidian* or Vidian Neuralgia* or Vidian Neuralgias* or Nerve Pain* or Nerve Pains* or Pain, Nerve* or Pains, Nerve* or Neuralgia, Ilioinguinal* or Ilioinguinal Neuralgia* or Ilioinguinal Neuralgias* or Neuralgias, Ilioinguinal*). mp.

13. (Nociceptive Pains* or Pain, Nociceptive* or Pains, Nociceptive* or Tissue Pain* or Pain, Tissue* or Pains, Tissue* or Tissue Pains* or Somatic Pain* or Pain, Somatic* or Pains, Somatic* or Somatic Pains*). mp.

14. (Arthralgias* or Joint Pain* or Joint Pains* or Pain, Joint* or Pains, Joint* or Polyarthralgia* or Polyarthralgias*). mp.

15. (Pain, Shoulder* or Pains, Shoulder* or Shoulder Pains*). mp.

16. (Sciatic Neuralgia* or Neuralgia, Sciatic* or Neuralgias, Sciatic* or Sciatic Neuralgias* or Sciatica, Bilateral* or Bilateral Sciatica* or Bilateral Sciaticas*). mp.

17. (Pain, Pelvic* or Pains, Pelvic* or Pelvic Pains*). mp.

18. (Fibromyalgia* or Fatigue syndrome* or Chronic Fatigue Disorder* or Chronic Fatigue Disorders* or Disorders, Chronic Fatigue* or Fatigue Disorder, Chronic* or Fatigue Disorders, Chronic* or Chronic Fatigue-Fibromyalgia Syndrome* or Chronic Fatigue Fibromyalgia Syndrome* or Chronic Fatigue-Fibromyalgia Syndromes* or Fatigue-Fibromyalgia Syndrome, Chronic* or Fatigue- Fibromyalgia Syndromes, Chronic* or Syndrome, Chronic Fatigue-Fibromyalgia* or Syndromes, Chronic Fatigue-Fibromyalgia* or Myalgic Encephalomyelitis* or Encephalomyelitis, Myalgic* or Royal Free Disease* or Fatigue Syndrome, Postviral* or Fatigue Syndromes, Postviral* or Postviral Fatigue Syndromes* or Syndromes, Postviral Fatigue* or Postviral Fatigue Syndrome* or Infectious Mononucleosis-Like Syndrome, Chronic* or Infectious Mononucleosis Like Syndrome, Chronic* or Chronic Fatigue and Immune Dysfunction Syndrome* or Chronic Fatigue Syndrome* or Chronic Fatigue Syndromes* or Fatigue Syndromes, Chronic*). mp

19. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18

20. exp Hypertension/

21. exp elevated blood pressure/

22. hypertens$.tw.

23. bloodpressure.tw.

24. ((elevat$ or high$ or rais$) adj3 (diastolic or systolic or arterial or blood) adj pressure) .tw.

25. (hyperten* or Hypertension* or Hypertensive* or high blood adj5 pressure* or High blood pressure* or high BP* or HBP* or hyperpiesia*, hypertonia*, cardiovascular* or cardiovascular* adj5 disease$ or cardiovascular* adj5 condition$ or elevate$ blood pressure* or increase$ adj3 blood pressure* or essential hypertension* or high adj3 pressure* or idiopathic hypertension*, malignant hypertension*, secondary hypertension*).mp.

26. 20 or 21 or 22 or 23 or 24 or 25

27. exp Diabetes mellitus/
28. exp Diabetes insipidus/
29. (diabet* or elevate$ adj5 blood sugar* or increas* adj7 sugar* increase$ adj5 blood sugar* or glyc?em$ adj5 control*). mp
30. 27 or 28 or 29
31. exp Obesity/
32. exp overnutrition/
33. exp body weight disorder/
34. (obes* or weight gain* or weight loss or body mass index or adipos* or overweight or over weight or overload syndrome* or overeat* or over eat* or overfeed* or over feed* or weight cycling or weight reduc* or weight losing or weight maint* or weight decreas* or weight watch* or weight control*). mp
35. 31 or 32 or 33 or 34
36. 19 or 26 or 30 or 35
37. exp Africa/
38. African filter: Africa/ or Africa* .tw. or Algeria .tw. or Angola .tw. or Benin .tw. or Botswana .tw. or Burkina Faso .tw. or Burundi .tw. or Cameroon .tw. or Canary Islands .tw. or Cape Verde .tw. or Central African Republic .tw. or Chad .tw. or Comoros .tw. or Congo .tw. or Democratic Republic of Congo .tw. or Djibouti .tw. or Egypt .tw. or Equatorial Guinea .tw. or Eritrea .tw. or Ethiopia .tw. or Gabon .tw. or Gambia .tw. or Ghana .tw. or Guinea .tw. or Guinea Bissau .tw. or Ivory Coast .tw. or Cote d'ivoire .tw. or Jamahiriya .tw. or Kenya .tw. or Lesotho .tw. or Liberia .tw. or Libya .tw. or Madagascar .tw. or Malawi .tw. or Mali .tw. or Mauritania .tw. or Mauritius .tw. or Mayotte .tw. or Morocco .tw. or Mozambique .tw. or Namibia .tw. or Niger .tw. or Nigeria .tw. or Principe .tw. or Reunion .tw. or Rwanda .tw. or Sao Tome .tw. or Senegal .tw. or Seychelles .tw. or Sierra Leone .tw. or Somalia .tw. or South Africa .tw. or St Helena .tw. or Sudan .tw. or Swaziland .tw. or Tanzania .tw. or Togo .tw. or Tunisia .tw. or Uganda .tw. or Western Sahara .tw. or Zaire .tw. or Zambia .tw. or Zimbabwe .tw. or Central Africa .tw. or Central African .tw. or West Africa .tw. or West African .tw. or Western Africa .tw. or Western African .tw. or East Africa .tw. or East African .tw. or Eastern Africa .tw. or Eastern African .tw. or North Africa .tw. or North African .tw or Northern Africa .tw. or Northern African .tw or South African .tw. or Southern Africa .tw. or Southern African .tw. or sub-Saharan Africa .tw. or sub-Saharan African .tw. or sub-Saharan Africa .tw. or sub-Saharan African .tw. not guinea pig .tw. or guinea pigs .tw. or aspergillums Niger .tw.
39. 37 or 38
40. exp therapy/
41. exp disease management/
42. exp long term care/
43. clinical study/
44. exp Psychotherapy/
45. exp Health Services/
46. preventive health services/
47. dietary services/
48. patient care/
49. rural health services/
50. urban health services/
51. exp rehabilitation/
52. nursing services/
53. nursing care/
54. exp Health promotion/
55. exp Behavior Therapy/
56. Social support/
57. Exercise/
58. Physical education and training/
59. Physical fitness/
60. Health education/
61. Health promotion/
62. Sports/
63. Exertion/
64. Exercise-therapy/
65. Nutrition/
66. Diet therapy/
67. Diabetic diet/
68. Diet therapy/
69. (behavior change* or intervention$ or behavior change* adj5 intervention$ or intervention$ or treatment* or therapy* or therap* or trial* or effect* or efficacy* or effectiveness*).af.
70. (exercise*or exertion*or sport* or walking or jogging or swimming or strength train* or resistance train* or aerobic train* or physical education* or physical fitness or training or nutrition* or life style* or lifestyle or health* behav* or health* educ* or health promot* or physic* activ* or bicyc* or cycling or weight lift* or gymnastic* or danc* or diet*).af.
71. (psychological or behavior$) adj (therapy or modif$ or strateg$ or intervention$).af.
72. (group therapy or family therapy or cognitive therapy).af.
73. (lifestyle or life style) adj (change$ or intervention$).af.
74. counsel?ing.af
75. social support.af
76. (peer adj2 support).af
77. Clinical trials filter:
Randomized controlled trial/ or Randomization/ or single blind procedure/ or double
blind procedure/ or crossover procedure/ or placebo/ or randomi?ed controlled trial$.tw. or Rct.tw. or random allocation.tw. or randomly allocated.tw. or allocated randomly.tw. or (allocated adj2 random).tw. or single blind$.tw or Double blind$.tw. or (treble or triple) adj (blind$).tw. or Placebo$.tw. or Prospective study/ or Case study/ or Case report.tw. or Abstract report/ or letter/

78. 40 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56 or 57 or 58 or 59 or 60 or 61 or 62 or 63 or 64 or 65 or 66 or 67 or 68 or 69 or 70 or 71 or 72 or 73 or 74 or 75 or 76 or 77

79. exp Attitude/
80. exp Behavior/
81. Lifestyle/
82. Health behaviour/
83. Feeding-behavior/
84. 79 or 80 or 81 or 82 or 83
85. qualitative*research* or explor*
86. Qualitative research filter:
   interview*.tw. or qualitative.tw.
87. 85 or 86
88. Observational studies search filter:
   Clinical study/ or Case control study or Family study/ or Longitudinal study/ or Retrospective study/ or Prospective study/ or Cohort analysis/ or (Cohort adj (study or studies)).mp. or (Case control adj (study or studies)).tw. or (follow up adj (study or studies)).tw. or (observational adj (study or studies)).tw. or (epidemiologic$ adj (study or studies)).tw. or (cross sectional adj (study or studies)).tw.
89. 36 AND 39 AND 78 AND 84 (Intervention studies)
90. 36 AND 39 AND 84 AND 87 (Qualitative studies)
91. 36 AND 39 AND 84 AND 88 (Observational studies)

PsycINFO (OvidSP)
1. exp Pain/
2. exp Pain measurement/
3. exp Fibromyalgia/
4. Fatigue syndrome.mp.
5. (Chronic Pains* or Pain, Chronic* or Pain, Chronic* or Widespread Chronic Pain* or Chronic Pain, Widespread* or Chronic Pains, Widespread* or Pain, Widespread Chronic* or Pains, Widespread Chronic* or Widespread Chronic Pains*). mp
6. (Musculoskeletal Pain* or Pelvic girdle pain* or Musculoskeletal Pains* or Pain, Musculoskeletal* or Pains, Musculoskeletal* or Myalgia*). mp
7. (Back Pains* or Pain, Back* or Pains, Back* or Backache* or Backaches* or Back Ache* or Ache, Back* or Aches, Back* or Back Aches* or Back Pain without Radiation* or Vertebogenic Pain Syndrome* or Pain Syndrome, Vertebogenic* or Pain Syndromes,
Vertebrogenic* or Syndrome, Vertebrogenic Pain* or Syndromes, Vertebrogenic Pain* or Vertebrogenic Pain Syndromes* or Back Pain with Radiation* or Back Pain, Low* or Back Pains, Low* or Low Back Pains* or Pain, Low Back* or Pains, Low Back* or Lumbago* or Lower Back Pain* or Back Pain, Lower* or Back Pains, Lower* or Lower Back Pains* or Pain, Lower Back* or Pains, Lower Back* or Low Back Ache* or Ache, Low Back* or Aches, Low Back* or Back Ache, Low* or Back Aches, Low* or Low Back Aches* or Low Backache* or Backache, Low* or Backaches, Low* or Low Backaches* or Low Back Pain, Recurrent* or Recurrent Low Back Pain* or Low Back Pain, Postural* or Postural Low Back Pain* or Low Back Pain, Mechanical* or Mechanical Low Back Pain* or Low Back Pain, Posterior Compartment*). mp

8. (Metatarsalgia* or Foot diseases*). mp

9. (Neck Pains* or Pain, Neck* or Pains, Neck* or Neckache* or Neckaches* or Cervicodynia* or Cervicodynias* or Neck Ache* or Ache, Neck* or Aches, Neck* or Neck Aches* or Cervical Pain* or Cervical Pains* or Pain, Cervical* or Pains, Cervical* or Cervicalgia* or Cervicalgias* or Posterior Cervical Pain* or Cervical Pain, Posterior* or Cervical Pains, Posterior* or Pain, Posterior Cervical* or Pains, Posterior Cervical* or Posterior Cervical Pains* or Posterior Neck Pain* or Neck Pain, Posterior* or Neck Pains, Posterior* or Pain, Posterior Neck* or Pains, Posterior Neck* or Posterior Neck Pains* or Anterior Cervical Pain* or Anterior Cervical Pains* or Cervical Pain, Anterior* or Cervical Pains, Anterior* or Pain, Anterior Cervical* or Pains, Anterior Cervical* or Anterior Neck Pain* or Anterior Neck Pains* or Neck Pain, Anterior* or Neck Pains, Anterior* or Pain, Anterior Neck* or Pains, Anterior Neck*). mp

10. (Neuralgias* or Neuropathic Pain* or Neuropathic Pains* or Pain, Neuropathic* or Pains, Neuropathic* or Neuropathy* or Neuropathies* or Neuropathy, Atypical* or Atypical Neuralgia* or Atypical Neuralgias* or Neuralgias, Atypical* or Neuralgia, Iliohypogastric Nerve* or Iliohypogastric Nerve Neuralgia* or Iliohypogastric Nerve Neuralgias* or Neuralgia, Iliohypogastric Nerve Neuralgia* or Neuralgia, Ilioinguinal* or Ilioinguinal Neuralgia* or Ilioinguinal Neuralgias* or Neuralgia, Ilioinguinal* or Neuralgia, Ilioinguinal Nerve Neuralgia* or Ilioinguinal Nerve Neuralgias* or Neuralgia, Ilioinguinal*). mp

11. (Nociceptive Pains* or Pain, Nociceptive* or Pains, Nociceptive* or Tissue Pain* or Pain, Tissue* or Pains, Tissue* or Tissue Pains* or Somatic Pain* or Pain, Somatic* or Pains, Somatic* or Somatic Pains*). mp

12. (Arthralgias* or Joint Pain* or Joint Pains* or Pain, Joint* or Pains, Joint* or Polyarthralgia* or Polyarthralgias*). mp

13. (Pain, Shoulder* or Pains, Shoulder* or Shoulder Pains*). mp

14. (Sciatic Neuralgia* or Neuralgia, Sciatic* or Neuralgias, Sciatic* or Sciatic Neuralgias* or Sciatica, Bilateral* or Bilateral Sciatica* or Bilateral Sciaticas*). mp

15. (Pain, Pelvic* or Pains, Pelvic* or Pelvic Pains*). mp
16. (Fibromyalgia* or Fatigue syndrome* or Chronic Fatigue Disorder* or Chronic Fatigue Disorders* or Disorders, Chronic Fatigue* or Fatigue Disorder, Chronic* or Fatigue Disorders, Chronic* or Chronic Fatigue-Fibromyalgia Syndrome* or Chronic Fatigue Fibromyalgia Syndrome* or Chronic Fatigue-Fibromyalgia Syndromes* or Fatigue-Fibromyalgia Syndrome, Chronic* or Fatigue- Fibromyalgia Syndromes, Chronic* or Syndrome, Chronic Fatigue-Fibromyalgia* or Syndromes, Chronic Fatigue-Fibromyalgia* or Myalgic Encephalomyelitis* or Encephalomyelitis, Myalgic* or Royal Free Disease* or Fatigue Syndrome, Postviral* or Fatigue Syndromes, Postviral* or Postviral Fatigue Syndromes* or Syndromes, Postviral Fatigue* or Postviral Fatigue Syndrome* or Infectious Mononucleosis-Like Syndrome, Chronic* or Infectious Mononucleosis Like Syndrome, Chronic* or Chronic Fatigue and Immune Dysfunction Syndrome* or Chronic Fatigue Syndrome* or Chronic Fatigue Syndromes* or Fatigue Syndromes, Chronic*). mp

17. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16

18. exp Hypertension/

19. exp blood pressure/

20. hypertens$.tw.

21. bloodpressure.tw.

22. (elevat$ or high$ or rais$) adj3 (diastolic or systolic or arterial or blood) adj pressure. tw

23. (hyperten* or Hypertension* or Hypertensive* or high blood adj5 pressure* or High blood pressure* or high BP* or HBP* or hyperpiesia*, hypertonia*, cardiovascular* or cardiovascular* adj5 disease$ or cardiovascular* adj5 condition$ or elevate$ blood pressure* or increase$ adj3 blood pressure* or essential hypertension* or high adj3 pressure* or idiopathic hypertension*, malignant hypertension*, secondary hypertension*). mp

24. 18 or 19 or 20 or 21 or 22 or 23

25. exp Diabetes/

26. (diabet* or elevate$ adj5 blood sugar* or increas* adj7 sugar* increase$ adj5 blood sugar* or glyc?em$ adj5 control*). mp

27. 25 or 26

28. exp Obesity/

29. (obes* or weight gain* or weight loss or body mass index or adipos* or overweight or over weight or overload syndrome* or overeat* or over eat* or overfeed* or over feed* or weight cycling or weight reduc* or weight losing or weight maint* or weight decreas* or weight watch* or weight control*). mp

30. 28 or 29

31. 17 or 24 or 27 or 30

32. African filter: Africa/ or Africa* .tw. or Algeria .tw. or Angola .tw. or Benin .tw. or Botswana .tw. or Burkina Faso .tw. or Burundi .tw. or Cameroon .tw. or Canary Islands .tw. or Cape Verde .tw. or Central African Republic .tw. or Chad .tw. or Comoros .tw. or Congo .tw. or Democratic Republic of Congo .tw. or Djibouti .tw. or Egypt .tw. or Equatorial Guinea .tw. or Eritrea .tw. or Ethiopia .tw. or Gabon .tw. or Gambia .tw. or
Ghana .tw. or Guinea .tw. or Guinea Bissau .tw. or Ivory Coast .tw. or Cote d'Ivoire .tw. or Jamahiriya .tw. or Kenya .tw. or Lesotho .tw. or Liberia .tw. or Libya .tw. or Madagascar .tw. or Malawi .tw. or Mali .tw. or Mauritania .tw. or Mauritius .tw. or Mayotte .tw. or Morocco .tw. or Mozambique .tw. or Namibia .tw. or Niger .tw. or Nigeria .tw. or Principe .tw. or Reunion .tw. or Rwanda .tw. or Sao Tome .tw. or Senegal .tw. or Seychelles .tw. or Sierra Leone .tw. or Somalia .tw. or South Africa .tw. or St Helena .tw. or Sudan .tw. or Swaziland .tw. or Tanzania .tw. or Togo .tw. or Tunisia .tw. or Uganda .tw. or Western Sahara .tw. or Zaire .tw. or Zambia .tw. or Zimbabwe .tw. or Central Africa .tw. or Central African .tw. or West Africa .tw. or West African .tw. or Western Africa .tw. or Western African .tw. or East Africa .tw. or East African .tw. or Eastern Africa .tw. or Eastern African .tw. or North Africa .tw. or North African .tw or Northern Africa .tw. or Northern African .tw or South African .tw. or Southern Africa .tw. or Southern African .tw. or sub-Saharan Africa .tw. or sub-Saharan African .tw. or sub-Saharan Africa .tw. or sub-Saharan African .tw. not guinea pig .tw. or guinea pigs .tw. or aspergillums Niger .tw.

33. exp health/
34. exp disabilities/
35. exp cross cultural differences/
36. African cultural groups/
37. 32 or 33 or 34 or 35 or 36
38. exp intervention/
39. Therapeutics
40. Treatment/
41. Intervention/
42. Exp Psychotherapy/
43. Health Services.mp.
44. Preventive health services.mp.
45. Dietary services.mp.
46. Patient care/
47. Rural health services.mp.
48. Urban health services.mp.
49. Rehabilitation/
50. Nursing services.mp.
51. Nursing care.mp.
52. Exp Health promotion/
53. Exp Behavior Therapy/
54. Social support/
55. Exercise/
56. Physical education and training/
57. Physical fitness/
58. Health education/
59. Health promotion/
60. Sports/
61. Exertion.mp.
62. Exercise-therapy.mp.
63. Nutrition/
64. Diet therapy.mp.
65. Diabetic diet.mp.
66. Diet therapy.mp.
67. (behavior change* or intervention$ or behavior change* adj5 intervention$ or intervention$ or treatment* or therapy* or therapy* or trial* or effect* or efficacy* or effectiveness*)
68. (exercise* or exertion* or sport* or walking or jogging or swimming or strength train* or resistance train* or aerobic train* or physical education* or physical fitness or training or nutrition* or lifestyle* or lifestyle or health* behavior* or health* education* or health promotion* or physical activity* or bicycling* or cycling or weight lifting* or gymnastic* or dancing* or diet*)
69. (psychological or behavior change$) adj (therapy or modification$ or strategy$ or intervention$).af.
70. (group therapy or family therapy or cognitive therapy).af.
71. (lifestyle or life style) adj (change$ or intervention$).af.
72. counseling.af
73. social support.af
74. (peer adj2 support).af
75. Clinical trials filter:
clinical trials/ or "treatment outcome clinical trial".md. or ((randomized adj7 trial*) or ((single or double or triple or trial*) and (blind* or mask*)) or (controlled adj3 trial*) or (clinical adj2 trial*)).ti,ab,id.
76. 38 or 39 or 40 or 41 or 42 or 43 or 44 or 45 or 46 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56 or 57 or 58 or 59 or 60 or 61 or 62 or 63 or 64 or 65 or 66 or 67 or 68 or 69 or 70 or 71 or 72 or 73 or 74 or 75
77. Attitude.mp.
78. Exp Behavior/
79. Lifestyle/
80. Health behaviour.mp.
81. Feeding-behavior/
82. 77 or 78 or 79 or 80 or 81
83. qualitative* research* or explor*
84. Qualitative research filter:
((("semi-structured" or semistructured or unstructured or informal or "in-depth" or...
indepth or "face- to-face" or structured or guide or guides) adj3 (interview* or discussion* or questionnaire*)).ti,ab,id. or (focus group* or qualitative or ethnograph* or fieldwork or "field work" or "key informant").ti,ab,id. or exp qualitative research/ or exp interviews/ or exp group discussion/ or qualitative study.md. not "Literature Review".md.

85. 83 or 84

86 Observational studies search filter:
Epidemiologic studies/ or case control studies/ or cohort studies/ or Case control.tw. or (cohort adj (study or studies)).tw. or Cohort analy$.tw. or (Follow up adj (study or studies)).tw. or (observational adj (study or studies)).tw. or Longitudinal.tw. or Retrospective.tw. or Cross sectional.tw. or Cross-sectional studies/

87. 31 AND 76 AND 82 (Intervention studies)
88. 31 AND 82 AND 85 (Qualitative studies)
89. 31 AND 82 AND 86 (Observational studies)

CINAHL (EBSCO)
S94 S34 AND S42 AND S87 AND S91 (Observational studies)
S93 S34 AND S42 AND S87 AND S90 (Qualitative studies)
S92 S34 AND S42 AND S81 AND S87 (Intervention studies)

S91 Observational studies search filter:
Prospective studies/ or Exp case control studies/ or Correlational studies/ or Nonconcurrent prospective studies/ or Cross sectional studies/ or (cohort adj (study or studies)).tw. or (observational adj (study or studies)).tw.

S90 S88 or S89

S89 TI Qualitative research filter:
TI "semi-structured" or semistructured or unstructured or informal or "in-depth" or indepth or "face- to-face" or structured or guide) adj3 (interview* or discussion* or questionnaire*)).ti,ab. or (focus group* or qualitative or ethnograph* or fieldwork or "field work" or "key informant").ti,ab. or interviews as topic/ or focus groups/ or narration/ or qualitative research

S88 TI qualitative*research* or explor*

S87 S82 or S83 or S84 or S85 or S86

S86 TI Feeding-behavio*

S85 (MH “Health behavior”)

S84 TI Lifestyle

S83 (MH “Behavior+”)

S82 (MH “Attitude+”)

S81 S43 or S44 or S45 or S46 or S47 or S48 or S49 or S50 or S51 or S52 or S53 or S54 or S55 or S56 or S57 or S58 or S59 or S60 or S61 or S62 or S63 or S64 or S65 or S66 or S67 or S68 or S69 or S70 or S71 or S72 or S73 or S74 or S75 or S76 or S77 or S78 or S79 or S80
S80 TI clinical trial*
S79 TI randomised controlled trial*
S78 TI peer N2 support
S77 TI social support*
S76 TI counseling*
S75 TI (lifestyle* or life style*) N1 (change$ or intervention$)
S74 TI group therapy* or family therapy* or cognitive therapy*
S73 TI (psychological or behavio?r?) N1 (therapy or modifi$ or strateg$ or intervention$)
S72 TI exercise*or exertion*or sport* or walking or jogging or swimming or strength train* or resistance train* or aerobic train* or physical education* or physical fitness or training or nutrition* or life style* or lifestyle or health* behav* or health* educ* or health promot* or physic* activ* or bicyc* or cycling or weight lift* or gymnastic* or danc* or diet*
S71 TI behavio?r change* or intervention$ or behavio?r change* N5 intervention$ or intervention$ or treatment* or therapy* or therap* or trial* or effect* or efficacy* or effectiveness*
S70 (MH “Diet therapy”)
S69 (MH “Diabetic diet”)
S68 (MH “Diet therapy”)
S67 (MH “Nutrition”)
S66 TI Exercise-therapy
S65 (MH “Exertion”)
S64 (MH “Sports”)
S63 (MH “Health promotion”)
S62 (MH “Health education”)
S61 (MH “Physical fitness”)
S60 (MH “Physical education and training”)
S59 (MH “Exercise”)
S58 TI Social support
S57 (MH “Behavior Therapy+”)
S56 (MH “Health promotion+”)
S55 (MH “Nursing care”)
S54 TI Nursing services
S53 (MH “Rehabilitation”)
S52 (MH “Urban health services”)
S51 (MH “Rural health services”)
S50 (MH “Patient care”)
S49 TI Diet*
S48 TI Preventive health services
S47 (MH “Health Services+”)
S46 (MH “Psychotherapy+”)
S45 Intervention
S44 TI Treat*
S43 (MH “Therapeutics+”)
S42 S35 OR S36 OR S37 OR S38 OR S39 OR S40 OR S41
S41 (MH “Africa, northern”)
S40 (MH “South Africa”)
S39 (MH “Africa, western”)
S38 (MH “Africa, southern”)
S37 (MH “Africa, eastern”)
S36 (MH “Africa, central”)
S35 (MH “Africa+”)
S34 S17 OR S24 OR S29 OR S33
S33 S30 OR S31 OR S32
S32 TI obes* or weight gain* or weight loss or body mass index or adipos* or overweight or over weight or overload syndrome* or overeat* or over eat* or overfeed* or over feed* or weight cycling or weight reduc* or weight losing or weight maint* or weight decreas* or weight watch* or weight control*
S31 TI “overnutrition+”
S30 (MH “Obesity+”)
S29 S25 OR S26 OR S27 OR S28
S28 TI diabet* or elevate* N5 blood sugar* or increas* N7 sugar* increase* N5 blood sugar* or glyc?em* N5 control*
S27 TI Diabetes complication*
S26 (MH “Diabetes insipidus+”)
S25 (MH “Diabetes mellitus+”)
S24 S18 OR S19 OR S20 OR S21 OR S22 OR S23
S23 TI hyperten* or Hypertension* or Hypertensive* or high blood N5 pressure* or High blood pressure* or high BP* or HBP* or hyperpiesia*, hypertonia*, cardiovascular* or cardiovascular* N5 disease* or cardiovascular* N5 condition* or elevate* blood pressure* or increase* N3 blood pressure* or essential hypertension* or high N3 pressure* or idiopathic hypertension*, malignant hypertension*, secondary hypertension*
S22 TI (elevat* or high* or rais*) N3 (diastolic* or systolic* or arterial* or blood* N2 pressure) or AB (elevat* or high* or rais*) N3 (diastolic* or systolic* or arterial* or blood* N2 pressure)
S21 TI (bloodpressure*) or AB (bloodpressure*)
S20 TI (hypertens*) or AB (hypertens*)
S19 (MH “blood pressure+”)
S18 (MH “Hypertension+”)
S17 S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16
S16 TI (Fibromyalgia* or Fatigue syndrome* or Chronic Fatigue Disorder* or Chronic Fatigue Disorders* or Disorders, Chronic Fatigue* or Fatigue Disorder, Chronic* or Fatigue Disorders, Chronic* or Chronic Fatigue-Fibromyalgia Syndrome* or Chronic Fatigue Fibromyalgia Syndrome* or Chronic Fatigue-Fibromyalgia Syndromes* or Fatigue-Fibromyalgia Syndrome, Chronic* or Fatigue- Fibromyalgia Syndromes, Chronic* or Syndrome, Chronic Fatigue-Fibromyalgia* or Syndromes, Chronic Fatigue-Fibromyalgia* or Myalgic Encephalomyelitis* or Encephalomyelitis, Myalgic* or Royal Free Disease* or Fatigue Syndrome, Postviral* or Fatigue Syndromes, Postviral* or Postviral Fatigue Syndromes* or Syndromes, Postviral Fatigue* or Postviral Fatigue Syndrome* or Infectious Mononucleosis-Like Syndrome, Chronic* or Infectious Mononucleosis Like Syndrome, Chronic* or Chronic Fatigue and Immune Dysfunction Syndrome* or Chronic Fatigue Syndrome* or Chronic Fatigue Syndromes* or Fatigue Syndromes, Chronic*)
S15 TI (Pain, Pelvic* or Pains, Pelvic* or Pelvic Pains*)
S14 TI Sciatic Neuralgia* or Neuralgia, Sciatic* or Sciatic Neuralgias* or Sciatica, Bilateral* or Bilateral Sciatica* or Bilateral Sciaticas*
S13 TI Pain, Shoulder* or Pains, Shoulder* or Shoulder Pains*
S12 TI Arthralgias* or Joint Pain* or Joint Pains* or Pain, Joint* or Pains, Joint* or Polyarthralgia* or Polyarthralgias*
S11 TI Nociceptive Pains* or Pain, Nociceptive* or Pains, Nociceptive* or Tissue Pain* or Pain, Tissue* or Pains, Tissue* or Tissue Pains* or Somatic Pain* or Pain, Somatic* or Pains, Somatic* or Somatic Pains*
S10 TI Neuralgias* or Neuropathic Pain* or Neuropathic Pains* or Pain, Neuropathic* or Pains, Neuropathic* or Neurodynia* or Neurodynias* or Neuralgia, Atypical* or Atypical Neuralgia* or Atypical Neuralgias* or Neuralgias, Atypical* or Neuralgia, Iliohypogastric Nerve* or Iliohypogastric Nerve Neuralgia* or Iliohypogastric Nerve Neuralgias* or Nerve Neuralgia, Iliohypogastric* or Nerve Neuralgias, Iliohypogastric* or Neuralgias, Iliohypogastric Nerve* or Paroxysmal Nerve Pain* or Nerve Pain, Paroxysmal* or Nerve Pains, Paroxysmal* or Pain, Paroxysmal Nerve* or Pains, Paroxysmal Nerve* or Paroxysmal Nerve Pains* or Neuralgia, Perineal* or Neuralgias, Perineal* or Perineal Neuralgia* or Perineal Neuralgias* or Neuralgia, Stump* or Neuralgias, Stump* or Stump Neuralgia* or Stump Neuralgias* or Neuralgia, Supraorbital* or Neuralgias, Supraorbital* or Supraorbital Neuralgia* or Supraorbital Neuralgias* or Neuralgia, Vidian* or Neuralgias, Vidian* or Vidian Neuralgia* or Vidian Neuralgias* or Nerve Pain* or Nerve Pains* or Pain, Nerve* or Pains, Nerve* or Neuralgia, Illoinguinal* or Illoinguinal Neuralgia* or Illoinguinal Neuralgias* or Neuralgias, Illoinguinal*
S9 TI Neck Pains* or Pain, Neck* or Pains, Neck* or Neckache* or Neckaches* or Cervicodynia* or Cervicodynia* or Neckache* or Ache, Neck* or Aches, Neck* or Neck Pains* or Cervical Pain* or Cervical Pains* or Pain, Cervical* or Pains, Cervical* or Cervicalgia* or Cervicalgias* or Posterior Cervical Pain* or Cervical Pain, Posterior* or

667
Cervical Pains, Posterior* or Pain, Posterior Cervical* or Pains, Posterior Cervical* or Posterior Cervical Pains* or Posterior Neck Pain* or Neck Pain, Posterior* or Neck Pains, Posterior* or Pain, Posterior Neck* or Pains, Posterior Neck* or Posterior Neck Pains* or Anterior Cervical Pain* or Anterior Cervical Pains* or Cervical Pain, Anterior* or Cervical Pains, Anterior* or Pain, Anterior Cervical* or Pains, Anterior Cervical* or Anterior Neck Pain* or Anterior Neck Pains* or Neck Pain, Anterior* or Neck Pains, Anterior* or Pain, Anterior Neck* or Pains, Anterior Neck*

S8 TI Metatarsalgia* or Foot diseases*

S7 TI Back Pains* or Pain, Back* or Pains, Back* or Backache* or Backaches* or Back Ache* or Ache, Back* or Aches, Back* or Back Aches* or Back Pain without Radiation* or Vertebragenic Pain Syndrome* or Pain Syndrome, Vertebragenic* or Pain Syndromes, Vertebragenic* or Syndrome, Vertebragenic Pain* or Vertebragenic Pain Syndromes* or Back Pain with Radiation* or Back Pain, Low* or Back Pains, Low* or Low Back Pains* or Pain, Low Back* or Pains, Low Back* or Lumbago* or Lower Back Pain* or Back Pain, Lower* or Back Pains, Lower* or or Lower Back Pains* or Pain, Lower Back* or Pains, Low Back Ache* or Ache, Low Back* or Aches, Low Back* or Back Ache, Low* or Back Aches, Low* or Low Back Aches* or Low Backache* or Backache, Low* or Backaches, Low* or Low Backaches* or Low Back Pain, Recurrent* or Recurrent Low Back Pain* or Low Back Pain, Postural* or Postural Low Back Pain* or Low Back Pain, Mechanical* or Mechanical Low Back Pain* or Low Back Pain, Posterior Compartment*

S6 TI Musculoskeletal Pain* or Pelvic girdle pain* or Musculoskeletal Pains* or Pain, Musculoskeletal* or Pains, Musculoskeletal* or Myalgia*

S5 TI Chronic Pains* or Pains, Chronic* or Pain, Chronic* or Widespread Chronic Pain* or Chronic Pain, Widespread* or Chronic Pains, Widespread* or Pain, Widespread Chronic* or Pains, Widespread Chronic* or Widespread Chronic Pains*

S4 TI Fatigue syndrome, chronic

S3 (MH “Fibromyalgia”)

S2 (MH “Pain measurement”)

S1 (MH “Pain+”)

Cochrane CENTRAL (Cochrane Central Register of Controlled Trials)

1. Mesh descriptor Pain explode all trees
2. Mesh descriptor Pain measurement explode all trees
3. Mesh descriptor Fibromyalgia, this term only
4. Mesh descriptor Fatigue syndrome, chronic, this term only
5. (pain* or “Chronic Pains” or “Pains, Chronic” or “Pain, Chronic” or “Widespread Chronic Pain” or “Chronic Pain, Widespread” or “Chronic Pains, Widespread” or “Pain, Widespread Chronic” or “Pains, Widespread Chronic” or “Widespread Chronic Pains”)

6. (musculoskeletal* or “Musculoskeletal Pain” or “Pelvic girdle pain” or “Musculoskeletal Pains” or “Pain, Musculoskeletal” or “Pains, Musculoskeletal” or “Myalgia”)

7. (back pain* or “Back Pains” or Pain, Back* or Pains, Back* or Backache” or “Backaches” or “Back Ache” or Ache, Back* or Aches, Back* or “Back Aches” or “Back
Pain without Radiation" or "Vertebrogenic Pain Syndrome" or Pain Syndrome, Vertebrogenic* or Pain Syndromes, Vertebrogenic* or Syndrome, Vertebrogenic Pain* or Syndromes, Vertebrogenic Pain* or "Vertebrogenic Pain Syndromes" or “Back Pain with Radiation” or Back Pain, Low* or Back Pains, Low* or “Low Back Pains” or Pain, Low Back* or Pains, Low Back* or “Lumbago” or “Lower Back Pain” or Back Pain, Lower* or Back Pains, Lower* or “Lower Back Pains” or Pain, Lower Back* or Pains, Lower Back* or “Low Back Ache” or Ache, Low Back* or Aches, Low Back* or Back Ache, Low* or Back Aches, Low* or Low Back Aches* or “Low Backache” or Backache, Low* or Backaches, Low* or “Low Backaches” or Low Back Pain, Recurrent* or “Recurrent Low Back Pain” or Low Back Pain, Postural* or “Postural Low Back Pain” or “Low Back Pain, Mechanical* or “Mechanical Low Back Pain” or Low Back Pain, Posterior Compartment*)

8. (Metatarsalgia* or Foot* near2 diseases or conditions)

9. (“Neck Pains” or Pain, Neck* or Pains, Neck* or “Neckache” or “Neckaches” or “Cervicodynia” or “Cervicodynas” or “Neck Ache” or Ache, Neck* or Aches, Neck* or “Neck Aches” or “Cervical Pain” or “Cervical Pains” or Pain, Cervical* or Pains, Cervical* or “Cervicalgia” or “Cervicalgias” or “Posterior Cervical Pain” or Cervical Pain, Posterior* or Cervical Pains, Posterior* or Pain, Posterior Cervical* or Pains, Posterior Cervical* or “Posterior Cervical Pains” or “Posterior Neck Pain” or Neck Pain, Posterior* or Neck Pains, Posterior* or Pain, Posterior Neck* or Pains, Posterior Neck* or “Posterior Neck Pains” or “Anterior Cervical Pain” or “Anterior Cervical Pains” or Cervical Pain, Anterior* or Cervical Pains, Anterior* or Pain, Anterior Cervical* or Pains, Anterior Cervical* or “Anterior Neck Pain” or “Anterior Neck Pains” or Neck Pain, Anterior* or Neck Pains, Anterior* or Pain, Anterior Neck* or Pains, Anterior Neck*)

10. (Neuralgias* or “Neuropathic Pain” or “Neuropathic Pains” or Pain, Neuropathic* or Pains, Neuropathic* or “Neurodynia” or “Neurodynias” or Neuralgia, Atypical* or Atypical Neuralgia* or Atypical Neuralgias* or Neuralgias, Atypical* or Neuralgia, Iliohypogastric Nerve* or Iliohypogastric Nerve Neuralgia* or Iliohypogastric Nerve Neuralgias* or Nerve Neuralgia, Iliohypogastric* or Nerve Neuralgias, Iliohypogastric Nerve* or “Paroxysmal Nerve Pain” or Nerve Pain, Paroxysmal* or Nerve Pains, Paroxysmal* or Pain, Paroxysmal Nerve* or Pains, Paroxysmal Nerve* or “Paroxysmal Nerve Pains” or Nerve Pain, Perineal* or Neuralgias, Perineal* or “Perineal Neuralgia” or “Perineal Neuralgias” or Neuralgia, Stump* or Neuralgias, Stump* or Stump Neuralgia* or Stump Neuralgias* or Neuralgia, Supraorbital* or Neuralgias, Supraorbital* or Supraorbital Neuralgia* or Supraorbital Neuralgias* or Neuralgia, Vidian* or Neuralgias, Vidian* or Vidian Neuralgia* or Vidian Neuralgias* or “Nerve Pain” or “Nerve Pains” or Pain, Nerve* or Pains, Nerve* or Neuralgia, Ilioinguinal* or “Ilioinguinal Neuralgia” or “Ilioinguinal Neuralgias” or Neuralgias, Ilioinguinal*)

11. (“Nociceptive Pains” or Pain, Nociceptive* or Pains, Nociceptive* or “Tissue Pain” or Pain, Tissue* or Pains, Tissue* or “Tissue Pains” or “Somatic Pain” or Pain, Somatic* or Pains, Somatic* or “Somatic Pains”)

12. (“Arthralgias” or “Joint Pain” or “Joint Pains” or Pain, Joint* or Pains, Joint* or “Polyarthralgia” or “Polyarthralgias”)

13. (Pain, Shoulder* or Pains, Shoulder* or “Shoulder Pains” or shoulder near2 pain*)

14. (“Sciatic Neuralgia” or Neuralgia, Sciatic* or Neuralgias, Sciatic* or “Sciatic Neuralgias” or Sciatica, Bilateral* or Bilateral near Sciatica* or “Bilateral Sciaticas”)

669
15. (Pain, Pelvic* or Pains, Pelvic* or Pelvic Pains* or “pelvic pain”)
16. ("Fibromyalgia" or "Fatigue syndrome" or Chronic Fatigue Disorder* or Chronic Fatigue Disorders* or Disorders, Chronic Fatigue* or Fatigue Disorder, Chronic* or Fatigue near3 Disorders, Chronic* or Chronic Fatigue-Fibromyalgia Syndrome* or Chronic Fatigue Fibromyalgia Syndrome* or Chronic Fatigue-Fibromyalgia Syndromes* or Fatigue-Fibromyalgia Syndrome, Chronic* or Fatigue- Fibromyalgia Syndromes, Chronic* or Syndrome, Chronic Fatigue-Fibromyalgia* or Syndromes, Chronic Fatigue-Fibromyalgia* or Myalgic Encephalomyelitis* or Encephalomyelitis, Myalgic* or Royal Free Disease* or Fatigue Syndrome, Postviral* or Fatigue Syndromes, Postviral* or Postviral Fatigue Syndromes* or Syndromes, Postviral Fatigue Syndrome* or Infectious Mononucleosis-Like Syndrome, Chronic* or Infectious Mononucleosis Like Syndrome, Chronic* or Chronic Fatigue and Immune Dysfunction Syndrome* or “Chronic Fatigue Syndrome” or “Chronic Fatigue Syndromes” or Fatigue Syndromes, Chronic*)
17. #1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11 or #12 or #13 or #14 or #15 or #16
18. Mesh descriptor Hypertension explode all trees
19. Mesh descriptor blood pressure explode all trees
20. hypertens* in Title or Keywords or Abstract
21. bloodpressure* in Title or Keywords or Abstract
22. (elevat* or high* or rais* near/3 diastolic or systolic or arterial or blood near pressure in Title or Abstract)
23. (hyperten* or "Hypertension" or "Hypertensive" or high blood near/5 pressure* or "High blood pressure" or hyperpiesia* or hypertonia* or cardiovascular* or cardiovascular* near/5 disease* or cardiovascular* near/5 condition* or elevate* blood pressure* or increase* near/3 blood pressure* or essential hypertension* or high near/3 pressure* or "idiopathic hypertension" or "malignant hypertension" or "secondary hypertension")
24. #18 or #19 or #20 or #21 or #22 or #23
25. Mesh descriptor Diabetes mellitus explode all trees
26. Mesh descriptor Diabetes insipidus explode all trees
27. Mesh descriptor Diabetes complications explode all trees
28. (diabet* or elevate* near5 blood sugar* or increas* near7 sugar* increase* near5 blood sugar* or glyc?em* near5 control*)
29. #25 or #26 or #27 or #28
30. Mesh descriptor Obesity explode all trees
31. Mesh descriptor overnutrition explode all trees
32. (obes* or weight gain* or weight loss or body mass index or adipos* or overweight or over weight or overload syndrome* or overeat* or over eat* or overfeed* or over feed* or weight cycling or weight reduc* or weight losing or weight maint* or weight decreas* or weight watch* or weight control*)
33. #30 or #31 or #32
34. #17 or #24 or #29 or #33
35. Mesh descriptor Africa explode all trees
36. Mesh descriptor Africa, central, this term only
37. Mesh descriptor Africa, eastern, this term only
38. Mesh descriptor Africa, southern, this term only
39. Mesh descriptor Africa, western, this term only
40. Mesh descriptor South Africa, this term only
41. African filter: Africa or Africa* or Algeria or Angola or Benin or Botswana or Burkina Faso or Burundi or Cameroon or Canary Islands or Cape Verde or Central African Republic or Chad or Comoros or Congo or Democratic Republic of Congo or Djibouti or Egypt or Equatorial Guinea or Eritrea or Ethiopia or Gabon or Gambia or Ghana or Guinea or Guinea Bissau or Ivory Coast or Cote d’Ivoire or Jamahiriya or Kenya or Lesotho or Liberia or Libya or Madagascar or Malawi or Mali or Mauritania or Mauritius or Mayotte or Morocco or Mozambique or Namibia or Niger or Nigeria or Principe or Reunion or Rwanda or Sao Tome or Senegal or Seychelles or Sierra Leone or Somalia or South Africa or St Helena or Sudan or Swaziland or Tanzania or Togo or Tunisia or Uganda or Western Sahara or Zaire or Zambia or Zimbabwe or Central Africa or Central African or West Africa or West African or Western Africa or Western African or East African or East African or Eastern Africa or Eastern African or North Africa or North African or Northern Africa or Northern African or South African or Southern Africa or Southern African or sub-Saharan Africa or sub-Saharan African or sub-Saharan African or sub-Saharan African not guinea pig or guinea pigs or aspergillums Niger
42. #35 or #36 or #37 or #38 or #39 or #40 or #41
43. Mesh descriptor Therapeutics explode all trees
44. Mesh descriptor Psychotherapy, this term only
45. Mesh descriptor Health Services explode all trees
46. Mesh descriptor Preventive health services explode all trees
47. Mesh descriptor Dietary services, this term only
48. Mesh descriptor Patient care, this term only
49. Mesh descriptor Rural health services, this term only
50. Mesh descriptor Urban health services, this term only
51. Mesh descriptor Rehabilitation, this term only
52. Mesh descriptor Nursing services, this term only
53. Mesh descriptor Nursing care, this term only
54. Mesh descriptor Health promotion, this term only
55. Mesh descriptor Behavior Therapy explode all trees
56. Mesh descriptor Social support, this term only
57. Mesh descriptor Exercise, this term only
58. Mesh descriptor Physical education and training, this term only
59. Mesh descriptor Physical fitness, this term only
60. Mesh descriptor Health education, this term only
61. Mesh descriptor Health promotion, this term only
62. Mesh descriptor Sports, this term only
63. Exertion
64. Mesh descriptor Exercise-therapy, this term only
65. Nutrition
66. Mesh descriptor Diet therapy, this term only
67. Mesh descriptor Diabetic diet, this term only
68. (diet therapy or diabetic diet)
69. (behavior change* or intervention* or behavior change* near5 intervention* or intervention* or treatment* or therapy* or therap* or trial* or effect* or efficacy* or effectiveness*)
70. (exercise* or exertion* or sport* or walking or jogging or swimming or strength train* or resistance train* or aerobic train* or physical education* or physical fitness or training or nutrition* or life style* or lifestyle or health* behavior* or health* education* or health promotion* or physical activity* or bicycling or cycling or weight lifting or gymnastics* or dance* or diet*)
71. (behavioral or behavior*) near (therapy or modification* or strategy* or intervention*) in All Fields
72. (group therapy or family therapy or cognitive therapy) in All Fields
73. (lifestyle or life style) near (change* or intervention*) in All Fields
74. counseling in All Fields
75. social support in All Fields
76. (peer near2 support) in All Fields
77. Clinical trials filter:
"clinical trial" or "clinical trial, phase i" or "clinical trial, phase ii" or "clinical trial, phase iii" or "clinical trial, phase iv" or controlled clinical trial or "multicentered study" or "randomized controlled trial" or double-blind method or clinical trials or clinical trials, phase i or clinical trials, phase ii or clinical trials, phase iii or clinical trials, phase iv or controlled clinical trials or randomized controlled trials or early termination of clinical trials or multicenter studies or ((randomized near/7 trial*) or (controlled near/3 trial*) or (clinical near/2 trial*) or (single or double* or triple* or tripled*) and (blind* or masked*)) in Title or Abstract
78. #43 or #44 or #45 or #46 or #47 or #48 or #49 or #50 or #51 or #52 or #53 or #54 or #55 or #56 or #57 or #58 or #59 or #60 or #61 or #62 or #63 or #64 or #65 or #66 or #67 or #68 or #69 or #70 or #71 or #72 or #73 or #74 or #75 or #76 or #77
79. Mesh descriptor Attitude explode all trees
80. Mesh descriptor Behavior explode all trees
81. Mesh descriptor Lifestyle, this term only
82. Mesh descriptor Health behavior, this term only
83. Mesh descriptor Feeding-behavior, this term only
84. #79 or #80 or #81 or #82 or #83
85. qualitative*research* or explor*
86. Qualitative research filter:
("semi-structured" or semistructured or unstructured or informal or "in-depth" or indepth or "face- to-face" or structured or guide near/3 interview* or discussion* or questionnaire* or (focus group* or qualitative or ethnograph* or fieldwork or "field work" or "key informant") or interviews or focus groups or narration or qualitative research)
87. #85 or #86
88. Observational studies search filter:
(epidemiologic or casecontrol or cohort or case control or cohort near stud* or cohort* or follow up near stud* or observational near stud* or longitudinal or retrospective or cross sectional or cross-sectional)
89. #34 and #42 and #78 and #84 (Intervention studies)
90. #34 and #42 and #84 and #87 (Qualitative studies)
91. #34 and #42 and #84 and #88 (Observational studies)

ISI Web of Science

1. (Chronic Pains* or Pains, Chronic* or Pain, Chronic* or Widespread Chronic Pain* or Chronic Pain, Widespread* or Chronic Pains, Widespread* or Pain, Widespread Chronic* or Pains, Widespread Chronic* or Widespread Chronic Pains*)
2. (Musculoskeletal Pain* or Pelvic girdle pain* or Musculoskeletal Pains* or Pain, Musculoskeletal* or Pains, Musculoskeletal* or Myalgia*)
3. (Back Pains* or Pain, Back* or Pains, Back* or Backache* or Backaches* or Back Ache* or Ache, Back* or Aches, Back* or Back Aches* or Back Pain without Radiation* or Vertebrogenic Pain Syndrome* or Pain Syndrome, Vertebrogenic* or Pain Syndromes, Vertebrogenic* or Syndrome, Vertebrogenic Pain* or Syndromes, Vertebrogenic Pain Syndrome* or Back Pain with Radiation* or Back Pain, Low* or Back Pains, Low* or Low Back Pains* or Pain, Low Back* or Low Pains, Low Back* or Lumbago* or Lower Back Pain* or Back Pain, Lower* or Back Pains, Lower* or Lower Back Pains* or Pain, Lower Back* or Pains, Lower Back* or Low Back Ache* or Ache, Low Back* or Aches, Low Back* or Back Ache, Low* or Back Aches, Low* or Low Back Aches* or Low Backache* or Backache, Low* or Backaches, Low* or Low Backaches* or Low Back Pain, Recurrent* or Recurrent Low Back Pain* or Low Back Pain, Postural* or Postural Low Back Pain* or Low Back Pain, Mechanical* or Mechanical Low Back Pain* or Low Back Pain, Posterior Compartment*)
4. (Metatarsalgia* or Foot diseases*)
5. (Neck Pains* or Pain, Neck* or Pains, Neck* or Neckache* or Neckaches* or Cervicodynia* or Cervicodynia* or Neck Ache* or Ache, Neck* or Aches, Neck* or Neck Aches* or Cervical Pain* or Cervical Pains* or Pain, Cervical* or Pains, Cervical* or Cervicalgia* or Cervicalgias* or Posterior Cervical Pain* or Cervical Pain, Posterior* or Cervical Pains, Posterior* or Pain, Posterior Cervical* or Pains, Posterior Cervical* or Posterior Cervical Pains* or Posterior Neck Pain* or Neck Pain, Posterior* or Neck Pains,
Posterior* or Pain, Posterior Neck* or Pains, Posterior Neck* or Posterior Neck Pains* or Anterior Cervical Pain* or Anterior Cervical Pains* or Cervical Pain, Anterior* or Cervical Pains, Anterior* or Pain, Anterior Cervical* or Pains, Anterior Cervical* or Anterior Neck Pains* or Anterior Neck Pains* or Neck Pain, Anterior* or Neck Pains, Anterior* or Pain, Anterior Neck* or Pains, Anterior Neck*)

6. (Neuralgias* or Neuropathic Pain* or Neuropathic Pains* or Pain, Neuropathic* or Pains, Neuropathic* or Neurolgia* or Neurolgias* or Neuralgia, Atypical* or Atypical Neuralgia* or Atypical Neuralgias* or Neuralgias, Atypical* or Neuralgia, Iliohypogastric Nerve* or Iliohypogastric Nerve Neuralgia* or Iliohypogastric Nerve Neuralgias* or Nerve Neuralgia, Iliohypogastric* or Nerve Neuralgias, Iliohypogastric* or Neuralgias, Iliohypogastric Nerve* or Paroxysmal Nerve Pain* or Nerve Pain, Paroxysmal* or Nerve Pains, Paroxysmal* or Pain, Paroxysmal Nerve* or Pains, Paroxysmal Nerve* or Paroxysmal Nerve Pains* or Neuralgia, Perineal* or Neuralgias, Perineal* or Perineal Neuralgia* or Perineal Neuralgias* or Neuralgia, Stump* or Neuralgias, Stump* or Stump Neuralgia* or Stump Neuralgias* or Neuralgia, Supraorbital* or Neuralgias, Supraorbit* or Supraorbital Neuralgia* or Supraorbital Neuralgias* or Neuralgia, Vidian* or Neuralgias, Vidian* or Vidian Neuralgia* or Vidian Neuralgias* or Nerve Pain* or Nerve Pains, Nerve* or Pains, Nerve* or Neuralgia, Iliohinguinal* or Iliohinguinal Neuralgia* or Iliohinguinal Neuralgias* or Neuralgias, Iliohinguinal*)

7. (Nociceptive Pains* or Pain, Nociceptive* or Pains, Nociceptive* or Tissue Pain* or Pain, Tissue* or Pains, Tissue* or Tissue Pains* or Somatic Pain* or Pain, Somatic* or Pains, Somatic* or Somatic Pains*)

8. (Arthralgias* or Joint Pain* or Joint Pains* or Pain, Joint* or Pains, Joint* or Polyarthralgia* or Polyarthalgias*)

9. (Pain, Shoulder* or Pains, Shoulder* or Shoulder Pains*)

10. (Sciatic Neuralgia* or Neuralgia, Sciatic* or Neuralgias, Sciatic* or Sciatic Neuralgias* or Sciatica, Bilateral* or Bilateral Sciatica* or Bilateral Sciaticas*)

11. (Pain, Pelvic* or Pains, Pelvic* or Pelvic Pains*)

12. (Fibromyalgia* or Fatigue syndrome* or Chronic Fatigue Disorder* or Chronic Fatigue Disorders* or Disorders, Chronic Fatigue* or Fatigue Disorder, Chronic* or Fatigue Disorders, Chronic* or Chronic Fatigue-Fibromyalgia Syndrome* or Chronic Fatigue Fibromyalgia Syndrome* or Chronic Fatigue-Fibromyalgia Syndromes* or Fatigue-Fibromyalgia Syndrome, Chronic* or Fatigue- Fibromyalgia Syndromes, Chronic* or Syndrome, Chronic Fatigue-Fibromyalgia* or Syndromes, Chronic Fatigue-Fibromyalgia* or Myalgic Encephalomyelitis* or Encephalomyelitis, Myalgic* or Royal Free Disease* or Fatigue Syndrome, Postviral* or Fatigue Syndromes, Postviral* or Postviral Fatigue Syndromes* or Syndromes, Postviral Fatigue* or Postviral Fatigue Syndrome* or Infectious Mononucleosis-Like Syndrome, Chronic* or Infectious Mononucleosis Like Syndrome, Chronic* or Chronic Fatigue and Immune Dysfunction Syndrome* or Chronic Fatigue Syndrome* or Chronic Fatigue Syndromes* or Fatigue Syndromes, Chronic*)

13. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12

14. (hyperten* or Hypertension* or Hypertensive* or high blood SAME5 pressure* or High blood pressure* or hyperpiesia* or hypertonia* or cardiovascular* or cardiovascular* adj5 diseases* or cardiovascular* SAME5 condition$ or elevates$ blood pressure* or increase$ SAME3 blood pressure* or essential hypertension* or high
SAME3 pressure* or idiopathic hypertension* or malignant hypertension* or secondary hypertension*)

15. (diabet* or elevate$ SAME5 blood sugar* or increas* SAME7 sugar* increase$ SAME5 blood sugar* or glyc$em* SAME5 control*)

16. (obes* or weight gain* or weight loss or body mass index or adipos* or overweight or over weight or overload syndrome* or overeat* or over eat* or overfeed* or over feed* or weight cycling or weight reduc* or weight losing or weight maint* or weight decreas* or weight watch* or weight control*)

17. 14 or 15 or 16

18. 13 or 17


20. (behavioral change* or intervention* or behavior$r change* SAME5 intervention* or intervention* or treatment* or therapy* or therap* or trial* or effect* or efficacy* or effectiveness*)

21. (exercise*or exertion*or sport* or walking or jogging or swimming or strength train* or resistance train* or aerobic train* or physical education* or physical fitness or training or nutrition* or life style* or lifestyle or health* behav* or health* educ* or health promot* or physic* activ* or bicyc* or cycling or weight lift* or gymnastic* or danc* or diet*)

22. (psychological or behavio$r*) SAME (therapy or modif* or strategy* or intervention*)

23. (group therapy or family therapy or cognitive therapy)

24. (lifestyle or life style) adj (change$ or intervention$)

25. counsel$ing.af

26. social support.af
27. (peer support).af
28. Clinical trials filter:
"clinical trial".pt. or "clinical trial, phase i".pt. or "clinical trial, phase ii".pt. or clinical trial, phase iii.pt. or clinical trial, phase iv.pt. or controlled clinical trial.pt. or "multicenter study".pt. or "randomized controlled trial".pt. or double-blind method/ or clinical trials as topic/ or clinical trials, phase i as topic/ or clinical trials, phase ii as topic/ or clinical trials, phase iii as topic/ or clinical trials, phase iv as topic/ or controlled clinical trials as topic/ or randomized controlled trials as topic/ or early termination of clinical trials as topic/ or multicenter studies as topic/ or ((randomi$ed adj7 trial*) or (controlled SAME3 trial*) or (clinical SAME2 trial*) or ((single or doubl* or tripl* or treb*) and (blind* or mask*))).ti,ab.
29. 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28
30. Attitude
31. behavio*
32. lifestyle
33. health behavio*
34. feeding behavio*
35. 30 or 31 or 32 or 33 or 34
36. qualitative*research* or explor*
37. Qualitative research filter
("semi-structured" or semistructured or unstructured or informal or "in-depth" or indepth or "face- to-face" or structured or guide near3 interview* or discussion* or questionnaire* or (focus group* or qualitative or ethnograph* or fieldwork or "field work" or "key informant") or interviews or focus groups or narration or qualitative research)
38. 36 or 37
39. Observational studies search filter:
(epidemiologic or case control or cohort or case control or cohort near stud* or cohort* or follow up near stud* or observational near stud* or longitudinal or retrospective or cross sectional or cross- sectional)
40. 18 AND 19 AND 29 AND 35 (Intervention studies)
41. 18 AND 19 AND 35 AND 38 (Qualitative studies)
42. 18 AND 19 AND 35 AND 39 (Observational studies)
### APPENDIX 29: INTERVENTION CHARACTERISTICS AND OUTCOMES

<table>
<thead>
<tr>
<th>Authors</th>
<th>Objective</th>
<th>Intervention description</th>
<th>Duration of follow-up</th>
<th>Control arm</th>
<th>Results</th>
</tr>
</thead>
</table>
| Debussche et al, 2012 | To improve metabolic control and health-related behaviours in type 2 diabetic patients | Quarterly outpatients counselling visits involving a brief introductory educational recall of dietary and physical activity recommendations, followed by free discussion of the difficulties encountered in daily life in applying recommendations based on individual assessments, culturally tailored goals set for personalised strategies to overcome barriers, follow-ups including evaluation and problem-solving, assessment of levels of physical activity, compliance with medication, and level of self-care for diabetic complications and management of daily stress, assessment of the patients’ eating patterns, addressing the implementation of strategies for change, Postal and telephone reminders were used to maximise participation in the scheduled visits. | 12 months (1 year)    | Usual care | **Attendance rate**: 71.2% (entire 3 sessions),  
**Biomedical outcomes**:  
Within group statistical significant changes (intervention): HbA1c, triglycerides  
Between group non statistical significant changes: HbA1c, total HDL, fasting blood glucose, BMI, waist circumference, fat mass and blood pressure, insulin treatment uptake, intensification of treatment  
**Behavioural outcomes**:  
Within group statistical significant changes (intervention): Sports activity, diet  
Within group non statistical significant changes (intervention): Physical activity  
Between group non statistical significant changes: Sports activity, diet                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
<table>
<thead>
<tr>
<th>Authors</th>
<th>Objective</th>
<th>Intervention description</th>
<th>Duration of follow-up</th>
<th>Control arm</th>
<th>Results</th>
</tr>
</thead>
</table>
| van der Does and Mash, 2013     | To increase self-care amongst patients and to encourage them to act as educators in their own communities. | Education: teaching style promoted an appreciative, interactive and evocative group process, sharing information that built on patient’s prior knowledge and experience. Topics: knowledge about diabetes, complications and treatment, healthy lifestyle, how to apply new knowledge in day to day life | 4 weeks               | No control group | Behavioural outcomes  
Within group statistical significant changes (intervention): Physical activity levels, diet (general), diet (specific), foot care, and perceived ability to teach others  
Within group non statistical significant changes (intervention): Medication adherence |
| Rotheram-Borus et al, 2012      | To improve lifestyle of eating, exercising and abstaining from alcohol and drugs | Theoretical basis: power to prevent program adapted into a format of peer support. Mobile phone-based peer support intervention. 3 components: (1) A series of 12 psychoeducational group sessions that address improving one’s lifestyle of eating, exercising, and abstaining from alcohol and drugs. Weekly sessions identified weekly successes, learning new information about nutrition, exercise, and disease self-management, problem solving in how to apply the information in daily life, managing uncomfortable emotions such as anger, anxiety or depression, role-playing new alternative strategies for coping with stress and sharing a meal. Content of the 12 sessions are orientation to the intervention, expectations and rules, principles of changing behaviour, being a | 12 weeks 6 months    | No control group | Attendance rate: 100%  
Biomedical and psychological outcomes:  
Within group statistical significant changes (intervention) at 3 months: Social support, night sleep, spiritual hope  
Within group non statistical significant changes (intervention) at 6 months: BMI, FBG, Social support, night sleep  
Within group non statistical significant changes (intervention) at all time points: Emotional distress, SBP  
Behavioural outcomes:  
Within group statistical significant changes (intervention) at 3 months: Positive action coping style  
Within group non statistical significant changes (intervention) at 6 months: Positive action coping style  
Within group non statistical significant changes (intervention) at all time points: Weekly exercise, number of steps taken daily, negative coping styles |
<table>
<thead>
<tr>
<th>Authors</th>
<th>Objective</th>
<th>Intervention description</th>
<th>Duration of follow-up</th>
<th>Control arm</th>
<th>Results</th>
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</thead>
<tbody>
<tr>
<td>Mathunjwa et al, 2013</td>
<td>To reduce cardio-metabolic disease risk factors in sedentary overweight and</td>
<td>Total body awareness, non-contact sport aerobic training comprising warm up, work out and cool down phases</td>
<td>10 weeks</td>
<td>No control group</td>
<td>Biomedical outcomes: Within group statistical significant changes (intervention): Weight, BMI, waist circumference, glucose, triglyceride, total cholesterol, low density lipoprotein cholesterol, SBP and DBP.</td>
</tr>
<tr>
<td>Authors</td>
<td>Objective</td>
<td>Intervention description</td>
<td>Duration of follow-up</td>
<td>Control arm</td>
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<tr>
<td>Ezema et al, 2014</td>
<td>To reduce blood sugar and blood pressure in a black African population with T2DM.</td>
<td>10 min warm up, pedaling at zero resistance), exercise on a bicycle ergometer at a moderate intensity of between 60% and 79% of HR max. Starting workload was 100 kg (17 W), increased at a pedal speed of 50 rpm to obtain a HR max 60%, increased in the first 2 weeks to and levelled up at 79% HR max throughout the remaining part of the training period. Initial exercise session was increased from 45 min in the first 2 weeks of training to and levelled up at 60 min throughout the remaining part of the training. After each training session, 10 min cool down was by pedalling at zero resistance.</td>
<td>8 weeks</td>
<td>Usual care</td>
<td>Prevalence of moderate cardiovascular risk reduced; Prevalence of low cardiovascular risk increased</td>
</tr>
<tr>
<td>Bello et al, 2012</td>
<td>To optimize blood sugar control</td>
<td>Counselling: weight reduction, BP and blood sugar control, avoidance of high fat foods consumption, eating balanced diets, avoiding self-medication, exercising regularly, avoiding cigarette smoking and drinking of alcohol, restriction on intake of foods with high sodium content. Emphasis on adherence to treatment (medications).</td>
<td>12 weeks</td>
<td>No control group</td>
<td>Biomedical outcomes: Within group statistical significant changes (intervention): Reduced BMI (obese subjects) and increased BMI (underweight subjects), HbA1c, FBS</td>
</tr>
<tr>
<td>Authors</td>
<td>Objective</td>
<td>Intervention description</td>
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<tr>
<td>Lamina and Okoye, 2012a</td>
<td>To reduce blood pressure, serum uric acid and psychosocial stress of pure black Africans with essential hypertension</td>
<td>Reassessment by physician and usual care (only methyldopa), continuous exercise training on a bicycle ergometer at low intensity of between 60 and 79% of HR max, starting workload was 100kg (17W) which was increased at a pedal speed of 50 r/min to obtain a HR max reserve 35%, increased in the first 2 weeks to and levelled up at 59% HR max reserve throughout the remaining part of the training period. The initial exercise session was increased from 45 minutes in the first 2 weeks of training to and levelled up at 60 min throughout the remaining part of the training.</td>
<td>9 weeks</td>
<td>Usual care</td>
<td>Biomedical and psychological outcomes: Between group statistical significant changes: SBP, DBP, psychosocial status, SUA, VO2 max and TC</td>
</tr>
<tr>
<td>Van Rooijen et al, 2010</td>
<td>To empower the participants with knowledge and skills necessary for medical nutrition therapy with the ultimate goal to help participants to become better at helping themselves</td>
<td>Education covered nutrition and physical activity. Theoretical basis: skilled helper model (Egan, 1998) - action leading to valued outcomes-staged approach to education. A staged approach to education based on the skilled-helper model was used to empower participants with knowledge and skills. Stage 1: current scenario (the story, blind spots, leverage-focussing/prioritising). Stage 2: preferred scenario (possibilities, change agenda-SMART goals, Commitment). Stage 3: Action strategies (possible</td>
<td>16 weeks</td>
<td>12 months</td>
<td>1 year</td>
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<td>Authors</td>
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<tr>
<td>van Rooijen et al, 2004</td>
<td>To promote regular participation in moderate-intensity physical activity on most days of the week in a community with limited resources</td>
<td>Education and aerobic exercise. Education on the management of type 2 diabetes, role of exercise in the management DM, prevention of hypoglycaemia during exercise, food sample examples and interpretation, food portion size, fibre, and salt in the diet. Checklist used to ensure that all subjects received all aspects of the education. Fortnightly exercise sessions to educate subjects about exercise, demonstrate the home exercises, and address problems experienced with exercise and relaxation.</td>
<td>12 weeks</td>
<td>*Education and relaxation.</td>
<td>Biomedical outcomes: Within group statistical significant changes (Intervention): Walking distance (6m) Within group statistical significant changes (Control group): HbA1c Within group non statistical significant changes (intervention): BMI Between group statistical significant changes: Walking distance (6m) Between group non statistical significant changes: HbA1c, BMI</td>
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<td>Authors</td>
<td>Objective</td>
<td>Intervention description</td>
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<td>home programmes, exercises consisted of low-impact aerobic large range movements performed to rhythmic music in the gymnasium with moderate intensity of 55-69% of maximal heart rate and a relative perceived exertion (RPE) of 12-14, incremental daily home exercise programme, use of daily physical activity records, community based groups formed based on instructions, instructions to increase walking at home from 10 minute to 45 minute sessions over 12 weeks of training. Participants instructed to walk twice a day, starting with 5 min per session and to increase their total daily walking time by 10 min every two weeks up to 45 minutes per day, Instructions to walk briskly whilst swinging the arms, Participants encouraged to work up a slight sweat and a faster respiratory rate, working at a moderate RPE of 12-14, or ‘somewhat hard’ on the Borg scale of perceived exertion, Notebooks with instructions and illustrations of the gentle flexibility exercises aimed at stretching the major muscle groups and maintaining range of motion were given to participants, participants urged to do their home...</td>
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<td>Authors</td>
<td>Objective</td>
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<td>exercises at least 5 times per week, physical activity log with detailed account of habitual daily activities and their associated duration, containing illustrations of some of the most used physical activities at home was compiled and given to participants with instructions to keep a daily record of the time they spent on each of the activities in the diary. Physical activity logs were checked, problems discussed and new logs handed out for the next fortnight. Adherence to the home programme discussed with individual subjects when subjects attended the fortnightly exercise sessions at the hospital.</td>
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SBP=Systolic Blood Pressure; DBP=Diastolic Blood Pressure; FBG= Fasting Blood Glucose; SUA=Serum Uric Acid. TC= Total Cholesterol; BMI=Body mass index; SS= Sum of skin fold; RHR= Resting heart rate; HbA1c=Fasting Glycated Haemoglobin; RPE=Rating of Perceived Exertion; FBS=Fasting blood sugar; LDL= Low density lipoprotein; VO2 max=maximal oxygen uptake/aerobic capacity; T2DM=Type 2 diabetes Mellitus; #= an initial intervention was received just before study commenced involving initial inpatients education (combined interactive lectures and focus group discussions) covering Understanding diabetes, Blood glucose goals and issues, The five food groups, Reduction of dietary fats, Physical activity and Prevention of foot complications. Physical activity workshops were organised involving 10 minutes of stretching and warm-up exercises, then a 30 to 40 minutes’ walk, followed by assessments of blood pressure, blood glucose and heart rate. Cooking workshops were organised; *= Fortnightly education (the same as intervention group) and relaxation exercises lasting 20 minutes per session, Participants instructed to tense and then relax alternating muscle groups. Participants did not receive any home exercises and were not advised to exercise at home.
Spine
Muscles
Marching on the spot

Shoulder rotations

Middle back stretch

Quadriceps stretch
Calf stretch

Hamstring stretch

Half lying on elbows

Modified press-up
Alternate leg and arm stretch

Back extension with shoulder lift

Alternate hip and knee flexion; cycling

Single knee to chest
Trunk rotation

Double knees to chest

Correct and wrong sitting postures
Correct lifting from sitting

Hamstring stretch

Lower limb rotations
Gluteal stretch

Quadriceps stretch

Inner thigh stretch

Back arching on all fours

Back extension in standing
**Superman**

**Back extension with leg lift**

**Bridging**
Wobbleboard (or improvised wobble board)

Sweeping
Working from a table
Having a bath

Getting water from the well
Mopping the floor

Working on a computer or writing
Farming
Relaxation exercises

Emotions
Correct lifting

Ironing
APPENDIX 31: PHYSIOTHERAPIST’S BOOKLET

‘Ukwu oma’ (Good back) Programme: informed by Guy’s and Guy’s and St Thomas’ Physiotherapy back rehabilitation programme and Nigerian urban back school model.

A Physiotherapist-led theory informed community-based self-management programme for people with nonspecific chronic low back pain in rural Nigeria

A six-weeks self-management programme
'Ukwu oma' (Good Back) programme is a Physiotherapist-led six week, once weekly self-management programme for non-specific chronic low back pain in rural Nigeria.

The programme is underpinned by the self-regulatory model of illness cognitions and delivered using the principles and techniques of Cognitive Behavioural Therapy and Motivational Interviewing.

Each weekly session is divided into 6 phases based on one of 6 specific themes. The phases are:

Phase 1: Education
Phase 2: Mapping of existing illness perceptions
Phase 3: Challenging maladaptive illness perceptions
Phase 4: Formulation of alternative illness perceptions and associated behaviours
Phase 5: Practising alternative behaviour (illness perceptions) in a supervised session and exploring the incorporation of these into daily lives
Phase 6: Alternative illness perceptions will be tested and strengthened by confirming their utility in daily life.

The 6 themes for the 6 sessions are:

Theme 1 (Session 1): Challenging the biomechanical model of non-specific chronic low back pain
Theme 2 (Session 2): Challenging the infective-degenerative model of CLBP
Theme 3 (Session 3): Challenging other negative thoughts about back pain
Theme 4 (Session 4): Managing exercise, pacing, goal setting and relaxation
Theme 5 (Session 5): Chronic disease and chronic pain
Theme 6 (Session 6): Managing and coping with flare ups, relaxation, help seeking and self-management

PROGRAMME DELIVERY

Screening of patients to identify those with non-specific chronic low back pain
Do you have weakness, heaviness or paralysis of your legs or any part of your body?
Do you have difficulty controlling your urine or faeces?
Do you lack sensation anywhere in your body?
Have you had fever or any illness or been admitted in the hospital recently?
Have you had a fall or any accident recently?
Have you lost weight recently?
Have you ever had cancer?
Have you been on drugs or are you currently on any drugs? For what?
Do you have wounds anywhere on your body?
Include someone negative to all the above questions and in addition is:
Aged over 18 years, with back pain lasting for more than 12 weeks.
Not pregnant
Can hear well, speak well, and is coherent

Introduction of the self-management programme

Physiotherapist introduces the ‘Ukwu oma’ (Good back) programme as a six week, once weekly self-management programme for non-specific chronic low back pain (CLBP) and emphasize the importance of completing all the 6 sessions.

Duration of each session of the programme: 2 hours of intervention and 30 minutes of break periods.

(NOTE: This intervention booklet is not designed to be read out to participants, rather the Physiotherapist/health care worker is expected to read and prepare for each session before delivering the session. This intervention is designed to be adapted to suit different participants in their socio-cultural contexts)

Session 1 (Week 1/Theme 1): Challenging the biomechanical model of non-specific chronic low back pain

Phase 1: Education (30 minutes)
(Physiotherapist gives each participant, the patient booklet and facilitates an interactive educational session (‘chunk-check-chunk’) guided by the physiotherapist booklet).

‘…Some people think that chronic back pain happens only to poor people or those living in rural areas or those involved in manual labour. Back pain is a worldwide problem and affects people of all races, classes and socio-economic status…’

(Facilitate discussions with patients by asking them to tell you what they understood by the pictures on the cover of their booklet- what you are looking for is their understanding that anyone regardless of race, ethnicity or socio-economic status can be affected by back pain).

‘…People involved in manual and non-manual jobs have back pain. In the UK, US and other developed countries, people are now empowered to manage their back pain by themselves-especially the one that has lasted a long time or comes and goes at
unpredictable times. This has been seen to be better for patients than expecting a cure for back pain. There is no magic cure for back pain anywhere in the world. This means that patients are given information about their back pain so that they can take better care of themselves. This is what we call self-management or that someone is self-managing their back pain…’

(Facilitate discussions with participants by asking them what they understood from the above paragraph—you are looking for their understanding that there is no magic cure for back pain).

‘…Now we will talk about how the back is made up…’

(Refer participants to the illustration of the vertebral column in their booklet while pointing at the illustration during the discussion)

‘…the spine consists of the neck (cervical spine), the middle back (thoracic spine) and lower back (lumbar spine). These are the bones of the spine called the vertebrae. They are living tissues, therefore they have a blood supply. This means that pain could come from the bones. There are 2 joints (facet) at each level of the spine. Just like you have other joints in the body like the shoulder or hip joints. The most important characteristic of joints is to move. For joints to be healthy, they need to be moved regularly. Yes. Regular movement of the joints encourage production and distribution of lubrication fluid and nutrition. This is why bed rest is not prescribed for people with back pain because it makes back pain worse. The ligaments attach bone to bone and help prevent excessive and unwanted movement occurring in a joint. The nerves send information to the brain and send information to the muscles. Nerves can be a source of pain too. Any structure that has a nerve can be a source of pain. This does not necessarily mean that there is damage…’

(Facilitate discussion by asking participants what they understood from the last statement/paragraph—look for understanding of blood supply, nerve supply, ligaments and joints)

(Refer participants to the illustrations of the human musculature as you continue to the next paragraph)

‘…There are also muscles of the spine which provide movement, support and stability of the spine. That is why we recommend exercises for people with back pain. The exercises in the programme work to strengthen the muscles of the spine and other muscles in the body. Muscles are of 2 types: the muscles that create movement (phasic muscles) and the muscles that keep us upright (postural muscles). When all the muscles are working well and the spine moves well (has good flexibility), the day to day stresses we place on our bodies are greatly reduced. Muscles are meant to move. Inactivity causes muscles to become weak, and have decreased tone especially in the 2 types of muscles we discussed earlier: that is the muscles for movement and posture. When muscles are used continuously—that is without rest, they can become tired (fatigue) and become painful e.g sitting for long periods or bending for long periods. Which is why we advocate pacing all your activities by having break periods in between your activities to avoid fatiguing your muscles. Our postures are partly inherited and influenced by our environment and lifestyles. Maintaining any position or activity for too long builds up stresses in the joints, muscles, ligaments and nerves which may lead to pain. This also reduces blood supply to these structures which causes pain. This is why we advocate that people should
regularly change their position or activities every 20 to 30 minutes. Muscles can tear with sudden lengthening that can occur with a sudden movement e.g. tearing the muscles at the back of your leg (hamstrings) from a sporting injury. Muscles can also strain if suddenly made to do something they are not accustomed to. This is why we emphasize the importance of gradual approach to activity....’

(Facilitate discussion by asking participants what they understood from the previous paragraph-you are looking for an understanding of a balance between lack of muscle activity and overworking muscles-that is people should ‘work’ but not ‘over work’ their muscles. Ask participants to identify examples of prolonged activities when people can fatigue their muscles and how these activities can be modified to ‘work’ but not ‘overwork’ the muscles. You are also looking for an understanding of what it means to approach activities gradually)

(Refer participants to the illustration of the vertebral column in their booklet while pointing at the illustration during the discussion)

‘...We will now discuss the discs and the myths surrounding them. The discs are found in between two bones called vertebrae. They help in transmitting weight through the spine-i.e. the length of the back, and allow movement. The discs are made up of 2 parts. The outer part [with rings of cartilage] has a nerve supply and blood supply. This means that the outer part can be a source of pain because it has a nerve supply. Any structure that has a nerve supply can produce pain. This also means that it can heal following injury because of its blood supply. The inner part is like a gel and has no nerve supply hence cannot be a source of pain.

(Facilitate discussion by asking participants their understanding of the previous paragraph-you are looking for understanding of ‘nerves’ for sensation and ‘blood vessels’ for healing)

‘...There are some myths about the disc. Discs cannot ‘slip out’ because they are securely attached to the bone on each side. Sometimes a disc may bulge enough to touch a nerve which may in some cases be painful. Discs can bulge a little just like a tyre that needs some air. However, disc bulges are often found in people with no back pain.

(facilitate discussion by asking participants if anyone had told them their ‘back’ or ‘discs’ had slipped out)

‘...From what we have discussed today, you can see that there can be no magic cure for your back pain. Some people might think that it is the work they do in their work places or at home that caused or maintains their back pain. This belief may not be correct because there are people who do similar work but do not have back pain. The best understanding to have is that it is the way you are doing your work not necessarily your work itself that maintains your chronic back pain. The most important thing therefore is to learn how to modify your lifestyle and daily activities in order to avoid chronic back pain and reduce its impact in your life. You know yourself better than any doctor. You know the activities that give you pain or increase your pain. It is therefore important for you to learn activities and appropriate modifications to your activities that will ease your pain. This is an important part of the self-management we have been talking about. Many times, what is more important is how you are doing something and for how long, than what activity you are doing. Yes, good posture is another very important thing to
consider and you are also going to learn how to perform functional activities adopting good postures...’

(Facilitate discussion by asking participants their understanding of the previous paragraph and the entire session-you are looking for their understanding that their CLBP depends a lot on what they can do for themselves rather than what others can do for them as there is no ‘cure’ for CLBP as it is not a ‘sickness’)

BREAK: 15 minutes. Snacks are shared.

Phases 2, 3 and 4 (45 minutes)

Phase 2: Mapping of existing illness perceptions

(Use these principles of assessment- facilitate participants to identify their illness beliefs, then link these beliefs into the vicious cycle of beliefs/thoughts leading/impacting on mood which then leads to physical sensations giving rise to particular behaviour which influences the impact of back pain in participants’ lives).

‘...Some people may think their back pain is related to their occupational activities or home chores or because of where they live...’...Now I want each person to tell me how they think their back pain is related to these activities...’

(Look out for an understanding of CLBP as a disease of hard labour, deprivation or rural habitation, specific environmental factors or rural health care facilities. Link their beliefs into the vicious cycle of beliefs/thoughts, mood, physical sensations, behaviour)

‘...Now I want each person to tell me how they feel in relation to these specific beliefs/thoughts, what is the mood associated with your specific thoughts/beliefs...?’

‘...Do you have any particular sensation on your body when you are thinking this way or feeling this mood...’ I need everyone to tell me what these sensations are...?’

‘... How do you react/behave when you are thinking, feeling or having the sensation on your body...?’

Phase 3: Challenging maladaptive illness perceptions

(At this point stimulate participants to question their own illness perceptions and the associated behaviour patterns (including ‘maladaptive’ behaviour) to explore if there is any utility in having these perceptions. These have to be discovered by the participants themselves)

‘...What effect do you think your thoughts/beliefs, mood or behaviour has on your back pain...?’

‘...how has this way of thinking, this mood and behaviour been helpful to your back pain...?’
‘...do you think there might be better ways of thinking and behaving in response to your back pain...?’

Phase 4: Formulation of alternative illness perceptions and associated behaviours

(Acknowledge an understanding of participants’ point of view and help them to discover alternative ways of thinking about their concerns. Ask and answer participants’ questions to stimulate critical thinking and to illuminate ideas. Facilitate modification of maladaptive illness perceptions into alternative perceptions conducive to achieving their life goals. Facilitate an understanding that CLBP is ubiquitous. Facilitate the exploration of good attributes of rural habitation. Facilitate an understanding of the ability of participants to influence their own environment)

(Facilitate the identification of people living in rural areas doing similar jobs that do not have back pain or managing their pain effectively. Finally relate discussions to the performance of circuit exercises and functional activities)

‘...I want everyone to tell me your life’s goals? Why are you here? What do you want this programme to achieve for you?’

‘...I understand your beliefs/thoughts, your mood...’

‘...do you think everyone doing the kind of activities you are involved in and living in your kind of environment has back pain...?’

‘...based on everything we have talked about, in what better ways can you think about your back pain...?’

‘...If you are thinking this way, what actions do you think you are going to take in relation to your back pain...?’

‘...what effects do you think this new behaviour will have on your back pain...?’

‘...in what way would you think about your back pain, that would make you want to do exercises or modify the way you do your functional activities...?’

Phase 5: Practising alternative (desired) behaviour in a supervised session (35 minutes)

(Facilitate the practising of alternative/desired) behaviour in a supervised session. The exercise and postural training sessions are done in a group. Start with warm up exercises—the same for all the sessions. Then the selected exercises for the day. This is followed by the selected functional activity training. Then finally the cool down exercises—the same for all the sessions)

‘...we are now going to carry out some activities that agree with that better way of thinking about your back pain...’

(Organise participants so that each person is starting in a particular station. All participants will be performing the same activity at the same time. Each participant will have 1 mat placed on the floor with a chair and stool).
‘...each person will stay on his/her station and by the end of this phase, you should have done all the exercises...’

Warm up exercises (5 minutes):
Marching on the spot
Shoulder rotations
Middle back stretch
Quadriceps stretch
Calf stretch
Hamstring stretch
Main exercises and functional activity training (15 minutes):
Half lying on elbows, to modified press-up, to back extension with shoulder lift, to alternate leg and arm stretch (5 minutes).
Alternate hip and knee flexion (progressing to cycling in the air), to single knee to chest, to double knees to chest, to trunk rotation (5 minutes).
Correct sitting posture, to correct standing, to correctly lifting a weight from a kitchen stool at a manageable height, to returning the weight on to the stool, to returning to sit correctly on the chair (5 minutes)

Cool down exercises (5 minutes):
Marching on the spot
Shoulder rotations
Middle back stretch
Lower limb rotations while lying down
Hamstring stretch while lying down
Quadriceps stretch while lying down
Gluteal stretch while sitting down
Inner thigh stretch while sitting down

‘...we will now do one little exercise before we all eat and then go home...’

(For the final 10 minutes of this session, participants are then encouraged to explore alternative illness perceptions in their daily lives outside of the supervised sessions that will help them to maintain these activities in their daily lives)

‘...could you tell me how you need to think to enable you sustain these activities on your own...?’

‘...is there anything in your life that needs to be different for you to sustain these activities on your own...?’
(Subsequently, a plan for change is developed followed by exploring the incorporation of behaviour change into daily lives.

Use ‘Elicit-provide-elicit’ techniques: that is find out what they know, give information where necessary and find out what they know. Facilitate the change talk by identifying and strengthening comments that show the desire to change, ability to change, reasons for change, need to change, commitment to change and taking steps towards behaviour change.

Focus at an individual level, on the most relevant area for each participant. Facilitate motivation to change the important areas by discussing outcome expectancies associated with the behaviour change, explore individual patient’s risk awareness and self-efficacy.

Set SMART goals needed to achieve the required behaviour change. Plan with the patient, the steps required to achieve the listed goals, required for the desired behaviour change.

Use action planning/set plans for action by identifying with the patients which activities, and when and how many times the activities need to be performed.

Use social support to facilitate behaviour change by allowing each participant to identify a family/friend to support him/her on the journey towards change)

‘...what benefits do you think these activities will have in your life...?’

‘...each person needs to make a plan on how to include these activities in their lives after this session...’

‘...what are your plans... do you have anyone that can support you in these plans...?’

Break: 15 minutes. Lunch is provided

Phase 6: Testing of alternative illness perceptions and associated behaviours which will be strengthened by confirming their utility in daily life (10 minutes)

(Behavioural experiments- participants will practice identified behaviour change and appraise their efficacy in their daily lives outside the session. Participants are asked to assess the effectiveness of these alternative illness perceptions and behaviour so that they can be discussed during the next session)

‘...For the rest of this week, I want you to practice all we have done today in your homes and in your work places. You can adapt these activities to suit your individual home or work environments...’

‘...assess how useful any of these activities are in your lives...I will ask you about them during the next session...’

(There is exploration of personal and social/environmental factors that constitute barriers and facilitators (determinants) to engaging in the desired behaviour change. Strategies to utilize the facilitators and reduce barriers to the desired change will be explored with the participant. Culturally tailored goals are then set for personalised
strategies to overcome identified barriers. Facilitate initiative and maintenance of the
behaviour and attending the next group session and reminders for exercises and
functional activity modification, with snacks and lunch as the incentives for the group
sessions)

‘...before we finish today’s session, do you think there might be barriers to doing these
activities on your own...what are they...?’

‘...are there things that might help you in carrying out these activities on your own...?’

‘...how can we reduce these barriers and increase the things that will help you maintain
these activities...?’

‘...Could each person give me the numbers of any one that will be supporting you on this
journey to change?’

END OF SESSION 1-WEEK 1

Session 2 (Week 2/Theme 2): - Challenging the infective-degenerative model of CLBP

Phase 1: Education (30 minutes)

(Physiotherapist refers the participants to the patient booklet and facilitates an
interactive educational session ('chunk-check-chunk') guided by the physiotherapist
booklet).

‘...Some people think their back pain is due to an infection. You need to understand that
most people (more than 85%) have the type of chronic back pain that is non-specific.
That is, the cause of chronic back pain in most people is not due to infection. What we
mean by non-specific is that the back pain is not caused by any particular disease and
certainly not infection. Some alternative health practitioners may tell you or may have
told you that you have infection based on some symptoms that you report to them. It is
important for you to know that some of these symptoms may have been related to your
mood due to your pain and its impact in your life and not necessarily due to any
infection. Once you are able to manage your mood effectively, you may find out that
you no longer experience these symptoms. Some of the symptoms may also be
associated with other chronic illnesses you may have such as hypertension, in which
case you need to go to the health centre or hospital to see the nurse or doctor so that
they can assess you properly. If you not, these symptoms may most likely be associated
with your mood.

(Facilitate discussions with patients by asking them to tell you what they understood
from the last paragraph- what you are looking for is their understanding that their back
pain is most likely not due to infection. You also want them to understand that mood
can affect bodily sensations. You also want to see their understanding of the need to get
themselves assessed for other chronic conditions which may affect bodily sensations but
which are often not associated with infection).
‘...Yes, even though some back pain may be specific, caused by a particular disease, these types of back pain will often show some specific signs such as paralysis, loss of sensation, lacking the ability to control urination or defaecation, fever, weight loss and others. Please understand that despite this, most peoples’ back pain including yours are not of this type...’

(Facilitate discussions by asking participants to mention some differences between people with non-specific back pain and those with specific back pain)

‘...Some people think that their back pain is caused by degeneration associated with ageing. You need to understand that ageing on its own is not a cause of back pain which explains why not every older person you know has back pain. We are going to explain this shortly.

(Tell participants to open their booklet and look at the illustration of the vertebral column)

‘...The discs as you can see are close to the bones of the back. Like we described previously these discs may become drier with ageing which is part of a normal ageing process. What is important for you to note is that normal ageing does not produce back pain in itself. What is important is that one learns how to take care of the back especially when getting older. Some factors which may lead to back pain include poor posture, injury, poor fitness, stiffness, genetics and lifestyle. Old age may be a risk factor for back pain but not a cause of back pain. Many of our people with non-specific chronic low back pain often go to the hospital expecting to take an X-ray to find out the specific ‘disease’ causing their pain. You need to understand that X-rays or scans are not always useful for diagnosing chronic back pain. Many people whose x-rays show wear and tear often associated with ageing often have no pain and yet some people with no wear and tear or degeneration in their x-rays have back pain. Of course, this can be related back to ageing. Old age is not in itself a cause of back pain; rather it is how people do things in their old age that may lead to back pain. That is why you may see some older people who do not have back pain while some of their colleagues and mates may have back pain.

(Facilitate discussions by asking participants to say their understanding of the previous paragraph- what you are looking for is their understanding that people can be old without having back pain and even abnormal X-ray does not mean that someone must have back pain).

‘...What is important is that you discover how you can incorporate daily exercises into your daily life, adopt correct posture and movement in your daily activities and minimise aggravating your back pain. For example, how you can manage exercises in your daily life, how you can pace your daily activities and set the goals you want to achieve in your life. Exercise is any activity that increases your heart rate, breathing rate and gets your body moving. This does not have to be a sport or a highly strenuous activity- even some of your daily activities can be seen as exercise. Exercise has many benefits including reducing your pain, reducing your stress and improving your emotional state, improving your sleep, reducing your blood pressure and improving the function of your heart and
lungs. When you begin to adopt exercises into your daily life, there are things that are very important to consider. For instance, pacing and progression of exercise is very important. Sometimes people with pain try to overcompensate by overworking themselves which increases their pain which in turn leads to prolonged rest periods and emotional distress. This may continue in a vicious cycle if not managed effectively. This is what we call the overdoing-underdoing cycle. Exercise and physical activity is often a problem if you do too much at a time because you may have to have prolonged rest when your pain flares up afterwards. This is unhelpful for your chronic back pain because it will result in unnecessary pain, suffering and a subsequent reduction in your daily life activities. All these will increase your emotional distress which may then increase the pain you are already feeling. You need to learn how to exercise and perform your daily activities and not flare up your back pain.

(Facilitate discussions by asking participants to say their understanding of the previous paragraph- what you are looking for is their understanding that the most important tools for their back pain include exercises and correctly performed physical/functional activities. You are also looking for their understanding that these exercises need to be progressed and paced properly to suit each person).

BREAK: 15 minutes. Snacks are shared.

Phases 2, 3 and 4 (45 minutes)

Phase 2: Mapping of existing illness perceptions

(Use these principles of assessment- facilitate participants to identify their illness beliefs, then link these beliefs into the vicious cycle of beliefs/thoughts which give rise to mood changes which may result into physical sensations that lead to particular behaviour, thus influencing the impact of back pain in participants’ lives).

‘...can you remind me of the proportion of people whose back pain may be due to a specific illness...?’

‘...can you remind me of the symptoms of people whose back pain may be due to a specific illness...?’

‘...how many of these symptoms are you experiencing...?’ Do you think your back pain is of this type...?’

‘...some people may think that their back pain is due to a specific illness...I want each person to tell me how this relates to your thoughts about your back pain...’

‘...How does this make you feel emotionally...?’

‘...what do you feel in your body when you are thinking or feeling this way...?’

‘...how do you act or behave when you are thinking or feeling this way...?’

Phase 3: Challenging maladaptive illness perceptions
Phase 4: Formulation of alternative illness perceptions and associated behaviours

(Acknowledge an understanding of participants’ point of view and help them to discover alternative ways of thinking about their concerns. Ask and answer participants’ questions to stimulate critical thinking and to illuminate ideas. Facilitate modification of maladaptive illness perceptions into alternative perceptions conducive to achieving their life goals. Facilitate the understanding that most back pain are not due to any specific disease or illness. Facilitate the exploration of the very different methods of treating/managing back pain that is due to a specific disease and the back pain that is not due to any specific disease. Facilitate an understanding of the ability of participants to influence their own environment. Finally relate discussions to the performance of circuit exercises and functional activities)

‘…I want everyone to tell me your life’s goals? Why are you here? What do you want this programme to achieve for you?’

‘…I understand why you think your back pain is due to a specific disease/illness. I understand why you feel and act the way you are doing at this time…’

‘…If you begin to see your back pain as not due to a particular illness or disease, what do you think may become different in your thoughts, mood or actions…?’

‘…based on everything we have talked about today, in what better ways can you think about your back pain…?’

‘…If you are thinking this way, what actions do you think you are going to take in relation to your back pain…?’

‘…what effects do you think this new behaviour will have on your back pain…?’

‘…in what way would you think about your back pain, that would make you want to do exercises correctly or modify the way you do your functional activities…?’

Phase 5: Practising alternative (desired) behaviour in a supervised session (35 minutes)

(Facilitate the practising of alternative/desired) behaviour in a supervised session. The exercise and postural training sessions are done in a group. Start with warm up exercises-the same for all the sessions. Then the selected exercises for the day. This is
followed by the selected functional activity training. Then finally the cool down exercises-the same for all the sessions)

‘...we are now going to carry out some activities that agree with that better way of thinking about your back pain...’

(Organise participants so that each person is starting in a particular station. All participants will be performing the same activity at the same time. Each participant will have 1 mat placed on the floor with a chair and stool).

‘...each person will stay on his/her station and by the end of this phase, you should have done all the exercises...’

Warm up exercises (5 minutes):
Marching on the spot
Shoulder rotations
Middle back stretch
Quadriceps stretch
Calf stretch
Hamstring stretch

Main exercises and functional activity training (15 minutes):
Back extension in standing to back arching on all fours to superman (5 minutes).
Back extension with leg lift to bridging to improvised wobble board. (5 minutes).
Sweeping with long broom to working/cooking from a table to bathing from a table to drawing water from the well while standing correctly (5 minutes)

Cool down exercises (5 minutes):
Marching on the spot
Shoulder rotations
Middle back stretch
Lower limb rotations while lying down
Hamstring stretch while lying down
Quadriceps stretch while lying down
Gluteal stretch while sitting down
Inner thigh stretch while sitting down

‘... We will now do one little exercise before we all eat and then go home...’

(For the final 10 minutes of this session, participants are then encouraged to explore alternative illness perceptions in their daily lives outside of the supervised sessions that will help them to maintain these activities in their daily lives)
‘...could you tell me how you need to think to enable you sustain these activities on your own...?’

‘...how were you able to do last week’s exercises on your own...?’

‘...is there anything in your life that needs to be different for you to sustain this week’s activities on your own...?’

(Subsequently, a plan for change is developed followed by exploring the incorporation of behaviour change into daily lives.

Use ‘Elicit-provide-elicit’ techniques: that is find out what they know, give information where necessary and find out what they know. Facilitate the change talk by identifying and strengthening comments that show the desire to change, ability to change, reasons for change, need to change, commitment to change and taking steps towards behaviour change.

Focus at an individual level, on the most relevant area for each participant. Facilitate motivation to change the important areas by discussing outcome expectancies associated with the behaviour change, explore individual patient’s risk awareness and self-efficacy.

Set SMART goals needed to achieve the required behaviour change. Plan with the patient, the steps required to achieve the listed goals required for the desired behaviour change.

Use action planning/set plans for action by identifying with the patients which activities, and when and how many times the activities need to be performed.

Use social support to facilitate behaviour change by allowing each participant to identify a family/friend to support him/her on the journey towards change.

‘...what benefits do you think these activities will have in your life...?’

‘...each person needs to make a plan on how to improve your last week’s performance and explore how to include these activities in their lives after this session...’

‘...what are your plans... do you have anyone that can support you in these plans...?’

‘...How can you get better than last week...?’

Break: 15 minutes. Lunch is provided

Phase 6: Testing of alternative illness perceptions and associated behaviours which will be strengthened by confirming their utility in daily life (10 minutes)

(Remind participants that the benefits of exercises and physical/functional activity modification will often take some time before becoming apparent. Emphasize that the benefits are only observed when people are persistent in performing the recommended exercises and activities.

Behavioural experiments- participants will practice identified behaviour change and appraise their efficacy in their daily lives outside the session. Participants are asked to...
assess the effectiveness of these alternative illness perceptions and behaviour so that they can be discussed during the next session)

‘...Was it easy doing the assignments you were given last week...?’

‘...What was easy...?’

‘...What was difficult...?’

‘...How useful were these activities in your lives...?’

(There is exploration of personal and social/environmental factors that constitute barriers and facilitators (determinants) to engaging in the desired behaviour change. Strategies to utilize the facilitators and reduce barriers to the desired change will be explored with the participants. Culturally tailored goals are then set for personalised strategies to overcome identified barriers. Facilitate initiative and maintenance of the behaviour change and attending the next group session and reminders for exercises and functional activity modification, with snacks and lunch as the incentives for the group sessions)

‘...What barriers did you encounter doing these activities on your own...?’

‘...What helped you in carrying out these activities on your own...?’

‘...How can we reduce these barriers and increase the things that helped you carry out these activities...?’

‘...How did your family/peer influence your carrying out these activities...?’

END OF SESSION 2-WEEK 2

Session 3 (Week 3/Theme 3): Challenging other negative thoughts about back pain

Phase 1: Education (30 minutes)

(Physiotherapist refers the participants to the patient booklet and facilitates an interactive educational session (‘chunk-check-chunk’) guided by the physiotherapist booklet).

‘...Just like we discussed and demonstrated in the previous sessions, negative thoughts and feelings sometimes unhelpfully influence the pain you experience. In this session, we are going to empower you to identify your feelings, your thoughts that lead to these feelings and how you could challenge these thoughts in your daily life...’

‘...Usually, when most people think about pain, they only think about it as a physical sensation. But you need to understand that pain always comes with thoughts and feelings about the pain which influence how the pain impacts your life...’

‘...For instance, some people may be thinking that the essence of their existence has been affected by chronic back pain. Some women may think that what makes them
women have been affected by back pain such as inability to conceive and bear children or inability to do home chores and take care of their family. Some men may think they are less men because they can no longer provide for their families or maintain intimate relationships with their spouse. You need to ask yourself, if your thoughts about your pain are making you to have positive or negative feelings. Ask yourself, are these thoughts true? Remember that negative feelings are likely to increase your experience of pain…’

‘…Being fully aware of your thoughts and your feelings about your pain may be difficult at first. Most people are not even aware of their thoughts and feelings until they pay attention to them. Different thoughts and feelings will result in different actions. Identifying these thoughts can be hard. It is usually easier to start with your feelings first as these are often easier to identify. There is a little exercise you can do often to help yourself- think about some of your feelings about your chronic pain situation, then think about some of your thoughts about your chronic pain situation that lead to these feelings, ask yourself if these thoughts are true and finally explore the actions that you normally take when in pain.

(Facilitate discussions by exploring participants’ understanding of the previous paragraphs- what you are looking for is their understanding that their thoughts/beliefs about their back pain is not necessarily true. You are also looking to see the understanding that thoughts/beliefs can make their pain better or worse therefore it is better to discard beliefs/thoughts that will make them feel worse about their pain)

‘…It has been found that people’s thoughts and feelings influence how they manage their back pain. This means that your own thoughts and feelings about your chronic back pain may be influencing how you are managing your back pain which in turn may be influencing the impact your chronic back pain is having in your life. There are helpful and unhelpful ways to think about your chronic back pain…’

‘…Helpful ways of thinking are those that enable you to deal effectively with a problem. Unhelpful ways of thinking can make a problem worse. You need to explore which of your thoughts that you have identified might be helpful or unhelpful in managing your pain. There are many ways you could think about a situation. You need to understand that different thoughts will lead to different feelings and different actions…’

(Refer participants to the illustration of the smiling and frowning faces in the patient booklet)

‘…We will do an exercise. Think of a situation, your thoughts in that situation, your feelings in that situation and your action in that situation… When we are struggling with pain, we often focus on unhelpful thoughts and find it harder to have helpful thoughts. You need to ask yourself- are the thoughts you have always helpful? Will they help improve your situation? Are your thoughts and beliefs always accurate…?’

‘…We will do a little exercise. Think about some common thoughts about your back pain. Then ask yourself- is each thought really true? Is it accurate? What is the evidence for and against each thought…?’

(Facilitate discussion by asking participants to say their beliefs/thoughts about their back pain and discuss if these are true by using evidence)
‘…Avoid being too hard on yourself and too much self-criticism. Many times, people are far more negative with themselves than they would be with others. Ask yourself if you would say the same things to a friend. If you are in a flare up of your pain, you may feel upset. It is sometimes more useful to challenge your thoughts later on when you are less stressed. If you challenge your thoughts, you may find that your feelings change. Even a small change can be useful. Like anything else, the more you do it, the better you will get at analysing your thoughts. Eventually, your unhelpful thoughts won’t have such a big effect on you managing your pain…’

‘…We will do another exercise. Think about some alternative to your unhelpful thoughts—that is more helpful thoughts. Next time you are in a situation that you found difficult such as an increase in your pain, after passing through this period, think about your feelings at the time, then think about the thoughts that might have led to these feelings. Think about what you could do to challenge the thoughts. Think about what you could do the next time the same situation occurs. Between now and the next session, consider a few situations where you know you become negative and try to see if there are any inaccurate patterns in the way you think, feel and act in these situations…’

‘…Now let’s use a specific example—the influence of spirituality in CLBP. Which do you think will be more useful for you in managing your CLBP: having a spiritual causal understanding of CLBP or following the biblical injunction to have hope and live happily despite your pain?

‘…do you think adopting correct posture and movement in your occupational activities is in line with God’s word-make the best of what you have…? How so…?

(Facilitate discussions by asking every participant to mention one negative thought about their back pain and then one positive counteractive thought about their back pain)

There are women who believe their back pain reduces their fertility levels and some men who believe their back pain affects their intimate relationships with their spouses. Back pain does not cause infertility or reduce fertility in women or men. We are doing this part privately as some people may prefer it this way.

‘…People who are interested in knowing more about this or have questions regarding fertility or sexuality in back pain can see me individually after this session…’

BREAK: 15 minutes. Snacks are shared.

Phases 2, 3 and 4 (45 minutes)

Phase 2: Mapping of existing illness perceptions

(Use these principles of assessment—facilitate participants to identify their illness beliefs, then link these beliefs into the vicious cycle of beliefs/thoughts leading giving rise to mood leading to physical sensations giving rise to particular behaviour which leads to the impact of back pain in participants’ lives).
‘...can you tell me your negative thoughts or beliefs about your back pain...?’

‘...How does this make you feel emotionally...?’

‘...what do you feel in your body when you are thinking or feeling this way...?’

‘...how do you act or behave when you are thinking or feeling this way...?’

Phase 3: Challenging maladaptive illness perceptions

(At this point stimulate participants to question their own illness perceptions and the associated behaviour patterns (including ‘maladaptive’ behaviour) to explore if there is any utility in having these perceptions. These have to be discovered by the participants themselves)

‘...what impact do you think these thoughts or behaviour (related to the beliefs that you are having back pain due to a specific illness) has on your back pain...?’

‘...how has this way of thinking, this mood and behaviour been helpful to your back pain...?’

‘...do you think there might be better ways of thinking and behaving in response to your back pain...?’

Phase 4: Formulation of alternative illness perceptions and associated behaviours

(Acknowledge an understanding of participants’ point of view and help them to discover alternative ways of thinking about their concerns. Ask and answer participants’ questions to stimulate critical thinking and to illuminate ideas. Facilitate modification of maladaptive illness perceptions into alternative perceptions conducive to achieving their life goals. Facilitate the understanding that most back pain are not due to any specific disease or illness. Facilitate the exploration of the very different methods of treating/managing back pain that is due to a specific disease, and back pain that is not due to any specific disease. Facilitate an understanding of the ability of participants to influence their own environment. Finally relate discussions to the performance of group exercises and functional activities)

‘...I want everyone to tell me your life’s goals? Why are you here? What do you want this programme to achieve for you?’

‘...I understand why you have these thoughts. I understand why you feel and act the way you are doing at this time...’

‘...based on everything we have talked about today, how can you control your negative thoughts...?’

‘...in what better ways can you think about your back pain...?’

‘...If you are thinking this way, what actions do you think you are going to take in relation to your back pain...?’

‘...what effects do you think this new behaviour pattern will have on your back pain...?’

‘...in what way would you think about your back pain, that would make you want to do exercises correctly or modify the way you do your functional or daily activities...?’
Phase 5: Practising alternative (desired) behaviour in a supervised session (35 minutes)

(Facilitate the practising of alternative/desired) behaviour in a supervised session. The exercise and postural training sessions are done in a circuit. Start with warm up exercises—the same for all the sessions. Then the selected exercises for the day. This is followed by the selected postural training and after this the relaxation exercises. Then finally the cool down exercises—the same for all the sessions)

‘...we are now going to carry out some activities that agree with that better way of thinking about your back pain...’

(Organise participants so that each person is starting in a particular station. All participants will be performing the same activity at the same time. Each participant will have 1 mat placed on the floor with a chair and stool).

‘...each person will stay on his/her station and by the end of this phase, you should have done all the exercises...’

Warm up exercises (5 minutes):
Marching on the spot
Shoulder rotations
Middle back stretch
Quadriiceps stretch
Calf stretch
Hamstring stretch

Main exercises and functional activity training (15 minutes):
Back extension in standing to back arching on all fours to superman (4 minutes).
Back extension with leg lift to bridging to improvised wobble board. (4 minutes).
Mopping the floor to working/writing on a table to brushing the teeth in standing (3 minutes) to farming with a hoe

Relaxation exercises: relaxed breathing while lying supine with deep muscle relaxation. Participants breathe in through the nose and breathe out through the mouth while focusing all their thoughts on breathing (they should avoid distracting thoughts and return their focus when distracted) (4 minutes)

Cool down exercises (5 minutes):
Marching on the spot
Shoulder rotations
Middle back stretch
Lower limb rotations while lying down
Hamstring stretch while lying down
Quadriceps stretch while lying down
Gluteal stretch while sitting down
Inner thigh stretch while sitting down

‘... We will now do one little exercise before we all eat and then go home...’

(For the final 10 minutes of this session, participants are then encouraged to explore alternative illness perceptions in their daily lives outside of the supervised sessions that will help them to maintain these activities in their daily lives)

‘...when do you think the relaxation exercises will be most helpful for you...?’

‘...could you tell me how you need to think to enable you sustain these activities on your own...?’

‘...how were you able to do last week’s exercises on your own...?’

‘...is there anything in your life that needs to be different for you to sustain this week’s activities on your own...?’

(Subsequently, a plan for change is developed followed by exploring the incorporation of behaviour change into daily lives.

Use ‘Elicit-provide-elicit’ techiques: that is find out what they know, give information where necessary and find out what they know. Facilitate the change talk by identifying and strengthening comments that show the desire to change, ability to change, reasons for change, need to change, commitment to change and taking steps towards behaviour change.

Focus at an individual level, on the most relevant area for each participant. Facilitate motivation to change the important areas by discussing outcome expectancies associated with the behaviour change, explore individual patient’s risk awareness and self-efficacy.

Set SMART goals needed to achieve the required behaviour change. Plan with the patient, the steps required to achieve the listed goals required for the desired behaviour change.

Use action planning/set plans for action by identifying with the patients which activities, and when and how many times the activities need to be performed.

Use social support to facilitate behaviour change by allowing each participant to identify a family/friend to support him/her on the journey towards change)

‘...what benefits do you think these activities will have in your life...?’

‘...each person needs to make a plan on how to improve your last week’s performance and explore how to include these activities in their lives after this session...’

‘...what are your plans... do you have anyone that can support you in these plans...?’

‘...How can you get better than last week...?’

Break: 15 minutes. Lunch is provided
Phase 6: Testing of alternative illness perceptions and associated behaviours which will be strengthened by confirming their utility in daily life (10 minutes)

(Behavioural experiments - participants will practice identified behaviour change and appraise their efficacy in their daily lives outside the session. Participants are asked to assess the effectiveness of these alternative illness perceptions and behaviour so that they can be discussed during the next session)

‘...Was it easy doing the assignments you were given last week...?’
‘...What was easy...?’
‘...What was difficult...?’
‘...How useful were these activities in your lives...?’

(There is exploration of personal and social/environmental factors that constitute barriers and facilitators (determinants) to engaging in the desired behaviour change. Strategies to utilise the facilitators and reduce barriers to the desired change will be explored with the participant. Culturally tailored goals are then set for personalised strategies to overcome identified barriers. Facilitate initiative and maintenance for the behaviour change and attending the next group session and reminders for exercises and functional activity modification, with snacks and lunch as the incentives for the group sessions)

‘...What barriers did you encounter doing these activities on your own...?’
‘...What helped you in carrying out these activities on your own...?’
‘...How can we reduce these barriers and increase the things that helped you carry out these activities...?’
‘...How did your family/peer influence your carrying out these activities...?’

END OF GROUP SESSION AND BEGINNING OF THE INDIVIDUAL SESSIONS OF SESSION 3

(Fertility and Sex advice for people with chronic pain will be administered only to participants who indicate interest in this. It will be delivered on a one-to-one basis)

Fertility (adapted)

(Consider using biblical illustrations for hope, pain acceptance and sensible action by seeking medical care for fertility problems as infertility is most times not a cause or consequence of CLBP)

(Refer the participant to the structure of the female reproductive system)

‘...looking at this picture, you can see that the womb is far from the bones of the back and that there is no connection between the female’s reproductive system and the back...’

‘...what can you say about this with regards to your back pain and the ability to conceive...?’
‘...is thinking this way helpful for your back pain...?’

Sexuality (adapted)

(Consider exploring with each participant the biblical meaning of sex-companionship/love and not a test of masculinity or femininity)

‘...People with low back pain are typically told how to lift, sit, bend, and exercise, but rarely are they advised on how to make love. Because sex can be as important as other activities but sometimes difficult to talk about, we have made this session to be one-to-one rather than having the session in your previous groups...’

‘...In this way we hope to present safe and comfortable alternatives, and answer questions which are often never asked...’

(Explore what each participant’s problems are and tailor intervention accordingly. Give graphical illustrations of safe sex positions for people with back pain for any participant that requests for this. Emphasize that couples need to adopt the position that is least painful for them, and need to adopt only the positions that work for them, as individuals are different and what works for one person may not work for the other person)

‘...what sex means to you may influence the impact your back pain is having on your sex life...’

‘...Decreased sexual activity is not uncommon in people with low back pain. Pain can quickly kill arousal. Anticipation of the pain can be equally as effective in limiting the mood. A partner’s concern for your comfort and safety can also be a limitation. Unfortunately, a considerate partner’s misconceptions about your abilities and desires can lead him or her to thoughtfully ignore you sexually. That can easily result in feelings of rejection which complicates the problem even more...’

‘...Therefore, communication is very important. Don’t keep your worrying thoughts to yourself as this may negatively affect your relationship. Talk to your partner about sex if you have chronic pain or when you feel your partner is worried about your pain. Talk openly and honestly to your partner about how pain affects your enjoyment of sex and what you want and need from your relationship and each other. Pick the right moment to have this conversation. It may be better to talk about it over dinner or while out walking, for example, rather than while in bed or in an intimate situation.

‘...If some part of the body is very painful, then, whether you’re a man or a woman, sex is bound to suffer.

‘...pain needn’t be the end of a fulfilling and satisfying sex life. In fact, research suggests that sexual activity, when comfortable, is often followed by several hours of pain relief.

‘...The longer you avoid sex, the bigger the fear of resuming sex becomes, and a downward spiral sets in. The lack of intimacy (not sex necessarily) can damage your relationship...’
‘…One useful tip is to plan ahead for sex…spontaneous sex may not be easy. Planning and preparing for sex may not sound as romantic, but is a better way of achieving a satisfying sex life…’

‘…People often experience more pain at certain times of day. So it may help to avoid sex at these times and have sex when your body is at its best, when your muscles are the least painful and your joints not so stiff and when you’re least tired…’

‘…Many people are most intimate just before going to sleep at night, but for people with chronic pain this can be the worst time. Instead, plan to spend time with your spouse in the afternoon, or whichever time of day you feel the least pain…’

‘…other tips for more comfortable sex include taking medication and timing sex for when your drug’s therapeutic effect is at its peak…’ You can experiment with different positions that lessen physical strain, such as lying side by side… You can also, do some gentle stretches…’

‘…Other intimate acts that are not sexual intercourse might help you feel more comfortable and reduce the anticipation of pain with sex. Don't forget cuddling and kissing. Touching and being touched increases feelings of intimacy. Try touching, cuddling, massaging and kissing, without intercourse as your goal. Take a shower together or massage each other in turn…’

‘…The health care facilities are there for you when you need them. Ask a doctor for help if pain is affecting your sex life. If your pain is so severe that sex seems out of the question, talk to your doctor. If necessary, your doctor can refer you for professional sexual counselling…’

‘…what thoughts about your back is affecting your sexuality…?’

‘…are these thoughts helpful…?’

‘…what are the better alternatives…?’

END OF SESSION 3-WEEK 3

Session 4 (Week 4/Theme 4): Managing exercise, pacing, goal setting and relaxation

Phase 1: Education (30 minutes)

(Physiotherapist refers the participants to the patient booklet and facilitates an interactive educational session (‘chunk-check-chunk’) guided by the physiotherapist booklet).

‘…Some people think that exercises can only be adopted as a preventive strategy for people who are not ill and that drugs are the only way to treat illnesses. You have to know that exercises can be preventive as well as therapeutic hence exercises can be done by healthy and sick people as long as it is done safely. Just like we described before, if your back pain is non-specific; it means that your back pain is not due to any specific illness. So it is important you incorporate exercises into your daily life and perform your functional activities the right way. It is also important that you understand that drugs
don’t cure back pain. Drugs are only used for temporary pain relief. Pain drugs are not meant to be taken all the time. Most of these drugs have serious side effects if taken all the time for prolonged periods of time.

(Facilitate discussions with the participants by asking their understanding of the last paragraph- you are looking for an understanding that drugs are not the main line of treatment for back pain and have side effects with prolonged use. You are also looking for the understanding that rather than looking for/depending on drugs for cure, exercises and behaviour modification are the best ways of ‘treating’ back pain)

‘...We previously discussed what we call the overdoing-underdoing (‘doing too much then doing too little’) cycle that may increase your pain experience and emotional distress. Just like we said before, exercise and activity is often a problem if you do too much in one go, then have to take prolonged rest when your pain flares up afterwards. This is not helpful for your chronic back pain because it can result in unnecessary pain and suffering and over time, a gradual reduction in your activity. You need to learn how to exercise and perform activities and not flare up your pain. To break the overdoing-underdoing cycle (‘doing too much then doing too little’), you need to perform moderate activity (in terms of time or amount) combined with limited rest (in terms of time or amount). Sometimes people may overwork themselves as a way of fighting back against the pain they experience. This is often stimulated by emotional distress. This is why we talk about the importance of pain acceptance. People who accept their pain are less likely to fight against their pain which in turn will reduce the impact their pain has in their lives. Breaking the overdoing-underdoing cycle eliminates the extreme pain part of the cycle. This cycle shows that over-activity leads to extreme pain which leads to prolonged rest/underdoing accompanied by frustration and guilt, which is then followed by over-activity and this continues in a vicious cycle. This vicious cycle is what we want to empower you to break. Yes. And you can break this cycle by having a cycle of moderate activity followed by limited rest, followed again by moderate activity and this continues in a cycle...’

(Facilitate discussions by asking participants examples of situations that might make people become involved in over-activity. Ask participants their opinion on over-activity- you are looking for the understanding that over-activity makes back pain worse and ultimately leads to underactivity afterwards which is also detrimental to back pain)

‘...You need to start by making your baselines. Start with what might be your moderate level of exercise. This should be a level of exercise that you can manage on your better and worse day of back pain. This exercise level in terms of the amount of time spent doing it, should be somewhere in between the high exercise levels you can do on the days you have little or no pain and the low exercise levels you can do on the days you have your severe pain. Once you have agreed on your baseline, you then need to make a weekly plan. Your weekly plan should entail increasing your baseline activity and exercise by small and manageable amounts. This is called pacing up your exercise- but please remember not to overdo it. You need to decide how to progress your exercise and physical activity levels. Decide whether to increase your amount daily, every 2-3 days or on a weekly basis. Make sure that you can achieve your increases, even on ‘better’ and ‘worse’ days. Do not progress at a rate you are not comfortable with. It is better to pace up gradually and slowly than risk falling back into the overdoing-under doing (‘doing too much then doing too little’) cycle. Exercise and activity diary is a great
way to keep track of your achievements. It allows you to gain confidence by recording what you achieve and how you feel about them. You can also involve your family members or peer if this is easier for you. You can continue to adopt exercises using activity diary or involving your family/peer after you have completed the 6 sessions in this programme. The diary or family/peer allows you to plan what exercise and activity you do each day in advance. Pacing is also very effective for daily activities. You may see some people that may work 24 hours every day for 1 week which may then break them down. Following this, they may stay at home for the next 2 weeks. If these people had paced their activities to about 8 hours per day, they could have worked for the entire 3 weeks...

(Facilitate discussions by asking participants’ understanding of the last paragraph— you are looking for their understanding that pacing exercises will enable them continue doing these exercises which in turn will make it effective for their back pain. Relate this understanding to pacing their daily activities)

‘...It is easy to incorporate the exercise/activity progression in your daily life, but you have to be the one to do this. You know yourself better than anyone. You know your daily activities better than anyone. You can start with a 7-day plan. Day 1 will be your baseline. Day 2 will be a progression of day 1. Day 3, a progression of day 2, Day 4, a progression of day 3, until day 7 which will be a progression of day 6. Or you can progress this way on a weekly basis. That is week 2 will be a progression of week 1 etc. A good exercise programme has some important elements. The warm up phase increases blood supply to the heart and reduces the chance of injury. Begin any exercise at a gentle pace. Example, if you are taking a walk, go slower for the first 15 minutes, then increase your speed to brisk walking before cool down. In the cool down phase, gradually reduce your activity. This reduces the heart rate and reduces the chance of muscle stiffness and injury. At the end of the exercises, perform stretches to help prevent your muscles aching the next day. If you are not used to exercising, your muscles might still ache the next day, this will subside after sometime. It is important that you continue your exercises despite this, as the pain will reduce and stop after sometime.

(Facilitate discussions by asking participants’ understanding of the last paragraph— you are looking for their understanding of the various ways they could pace their exercises/functional daily activities— using home and work diaries or through family members and peers)

BREAK: 15 minutes. Snacks are shared.

Phases 2, 3 and 4 (45 minutes)

Phase 2: Mapping of existing illness perceptions

(Use these principles of assessment— facilitate participants to identify their back pain beliefs, then link these beliefs into the vicious cycle of beliefs/thoughts giving rise to mood leading to physical sensations giving rise to particular behaviour which leads to the impact of back pain in participants’ lives).
‘...Some people may have thought that exercises are only useful for people without any problems...’

‘...Other people may be thinking that exercises are not a form of treatment for back pain...’

‘...Some people may think their back pain can only be treated with drugs...’

‘...Why did you think this way...?’

‘...I want each person to tell me how effective drugs have been in treating your back pain...’

‘...How has this ineffectiveness made you feel...?’

‘...Why do you think these drugs are ineffective...?'

‘...How does this understanding make you feel emotionally?

‘...Do you have any particular sensation on your body when you are thinking this way or feeling this mood...?’

‘...How do you react/behave when you are thinking, feeling or having the sensation on your body...?’

Phase 3: Challenging maladaptive illness perceptions

(At this point stimulate participants to question their own illness perceptions and the associated behaviour patterns (including ‘maladaptive’ behaviour) to explore if there is any utility in having these perceptions. These have to be discovered by the participants themselves)

‘...what do you think is the effect of not believing that exercise is a useful treatment tool for your back pain...?’

‘...What do you think is the effect of believing that only drugs can cure your back pain...?’

‘...What has been the effect of searching for a cure for your back pain...?’

‘...How has all these made you feel...?’

‘...How do you behave in response to all these...?’

‘...how has this way of thinking, this mood and behaviour been helpful to your back pain...?’

‘...do you think there might be better ways of thinking and behaving in response to your back pain...?’

Phase 4: Formulation of alternative illness perceptions and associated behaviours

(Acknowledge an understanding of participants’ point of view and help them to discover alternative ways of thinking about their concerns. Ask and answer participants’ questions to stimulate critical thinking and to illuminate ideas. Facilitate modification of maladaptive illness perceptions into alternative perceptions conducive to achieving
their life goals. Facilitate an understanding of the ability of participants to influence their own behaviour and environment

‘...I want everyone to tell me your life’s goals? Why are you here? What do you want this programme to achieve for you?’

‘...I understand why you didn’t believe that exercises and paced physical activities are very useful in treating your back pain...probably nobody has given you information about exercises before now...’

‘...I understand your beliefs/thoughts, your mood...it can be frustrating when you have been made to understand that drugs are for treating diseases....yet it hasn’t worked for your back pain...’

‘...based on everything we have talked about, in what better ways can you think about your back pain in relation to drugs...?’

‘...what are the better alternatives to drugs in relation to your back pain...’

‘...If you are thinking this way, what actions do you think you are going to take in relation to your back pain...?’

‘...what effects do you think this new behaviour will have on your back pain...?’

‘...in what way would you think about your back pain, that would make you want to do exercises or modify the way you do your functional/daily activities...?’

Phase 5: Practising alternative (desired) behaviour in a supervised session (35 minutes)

(Facilitate the practising of alternative/desired) behaviour in a supervised session. The exercise and postural training sessions are done in a group. Start with warm up exercises-the same for all the sessions. Then the selected exercises for the day. This is followed by the selected postural training. Then finally the cool down exercises-the same for all the sessions)

‘...we are now going to carry out some activities that agree with that better way of thinking about your back pain...’

(Organise participants so that each person is starting in a particular station. All participants will be performing the same activity at the same time. Each participant will have 1 mat placed on the floor with a chair and stool).

‘...each person will stay on his/her station and by the end of this phase, you should have done all the exercises...’

Warm up exercises (5 minutes):

Marching on the spot
Shoulder rotations
Middle back stretch
Quadriceps stretch
Calf stretch
Hamstring stretch

Main exercises and functional activity training (15 minutes):
Half lying on elbows, to modified press-up, to back extension with shoulder lift, to alternate leg and arm stretch (5 minutes).
Alternate hip and knee flexion (progressing to cycling in the air), to single knee to chest, to double knees to chest, to trunk rotation (5 minutes).
Correct sitting posture, to correct standing, to correctly lifting a weight from a kitchen stool at a manageable height, to returning the weight on to the stool, to returning to sit correctly on the chair to carpentry from a good height (5 minutes)
Cool down exercises (5 minutes):
Marching on the spot
Shoulder rotations
Middle back stretch
Lower limb rotations while lying down
Hamstring stretch while lying down
Quadriceps stretch while lying down
Gluteal stretch while sitting down
Inner thigh stretch while sitting down
‘... we will now do one little exercise before we all eat and then go home...’
(For the final 10 minutes of this session, participants are then encouraged to explore alternative illness perceptions in their daily lives outside of the supervised sessions that will help them to maintain these activities in their daily lives)
‘...could you tell me how you need to think to enable you sustain these activities on your own...?’
‘...what was your experience doing these activities on your own after the previous sessions...?’
‘...is there anything in your life that needs to be different for you to sustain these activities on your own...?’

(Subsequently, a plan for change is developed followed by exploring the incorporation of behaviour change into daily lives.
Use ‘Elicit-provide-elicit’ techniques: that is find out what they know, give information where necessary and find out what they know. Facilitate the change talk by identifying and strengthening comments that show the desire to change, ability to change, reasons for change, need to change, commitment to change and taking steps towards behaviour change.
Focus at an individual level, on the most relevant area for each participant. Facilitate motivation to change the important areas by discussing outcome expectancies associated with the behaviour change, explore individual patient’s risk awareness and self-efficacy.

Set SMART goals needed to achieve the required behaviour change. Plan with the patient, the steps required to achieve the listed goals required for the desired behaviour change.

Use action planning/set plans for action by identifying with the patients which activities, and when and how many times the activities need to be performed.

Use social support to facilitate behaviour change by allowing each participant to identify a family/friend to support him/her on the journey towards change)

‘…what benefits do you think these activities will have in your life…?’

‘…What benefits have these activities had so far in your life…?’

‘…each person needs to make a plan on how to include these activities in their lives…’

‘…what are your plans…? do you have anyone that have been supporting you in these plans…?’

Break: 15 minutes. Lunch is provided

Phase 6: Testing of alternative illness perceptions and associated behaviours which will be strengthened by confirming their utility in daily life (10 minutes)

(Behavioural experiments- participants will practice identified behaviour change and appraise their efficacy in their daily lives outside the session. Participants are asked to assess the effectiveness of these alternative illness perceptions and behaviour so that they can be discussed during the next session)

‘…For the rest of this week, I want you to practice all we have done today in your homes and in your work places. You can adapt these activities to suit your individual home or work environments…’

‘…assess how useful any of these activities are in your lives…I will ask you about them during the next session…’

(There is exploration of personal and social/environmental factors that constitute barriers and facilitators (determinants) to engaging in the desired behaviour change. Strategies to utilize the facilitators and reduce barriers to the desired change will be explored with the participant. Culturally tailored goals are then set for personalised strategies to overcome identified barriers. Facilitate initiative and maintenance for the behaviour change and attending the next group session and reminders for exercises and functional activity modification, with snacks and lunch as the incentives for the group sessions)

‘…before we finish today’s session, do you think there might be barriers to doing these activities on your own...what are they…?’
‘...what barriers did you encounter doing the activities given in the previous sessions?’

‘...are there things that might help you in carrying out these activities on your own...?’

‘...What helped you reduce these barriers in the previous weeks...?’

‘...how can we reduce these barriers and increase the things that will help you maintain these activities for this week...?’

‘...Could each person give me the numbers of any one that will be supporting you on this journey to change?

END OF SESSION 4-WEEK 4

Session 5 (Week 5/Theme 5): Chronic disease and chronic pain

Phase 1: Education (30 minutes)

(Physiotherapist asks all participants to bring out the patient booklet. Physiotherapist facilitates an interactive educational session (‘chunk-check-chunk’) guided by the physiotherapist booklet).

‘...You need to understand the difference between chronic pain and acute pain. Just like acute disease is different from chronic disease. Acute pain is the pain we feel immediately after injuring ourselves and while the injury is undergoing repair such as when you touch a hot object and get a burn injury. Acute pain is the pain that is present during healing which aims to alert us to prevent further injury to that area. Chronic pain on the other hand, is pain that continues even though healing has occurred. Similarly, acute disease is a disease with a rapid onset and/or a short course and can be cured, whereas chronic disease is one lasting 3 months or more or even a life time, and generally cannot be prevented by vaccines or cured by medication, nor do they just disappear. Example of chronic disease is diabetes or hypertension, and acute disease is malaria. Because you can take antimalarial drugs and cure your malaria, though when you are bitten again by mosquitoes, you will have malaria again. So while acute conditions are treated and cured, chronic conditions are managed. Patients are taught how to self-manage their chronic condition and live fruitful and productive lives with their chronic condition.

(Facilitate discussions by asking participants their understanding of the last paragraph-you are looking for their understanding of the differences between chronic pain/diseases and acute pain/diseases. They need to understand that while acute conditions are cured often times by drugs, chronic conditions are managed, often times by a modification of life style)

‘...It is important for you to understand how we feel acute and chronic pain. For acute pain, we have sensors in our skin, ligaments, muscles, joints and other structures in our body. These sensors are activated when there is heat, pressure, stretch and strong input. The information from the tissues is sent along nerves through the spinal cord to the brain which interprets the message and decides if pain should be felt. When the nerve itself is irritated, it can give symptoms such as pins and needles, numbness, burning or shooting sensations. Acute pain is helpful because it makes us take things easy to allow
healing to occur. With chronic pain, the link between pain and damage is complicated. Some people may have an ongoing condition that is the source of their pain. However, it is not unusual to find no direct link between the original damage which may have long healed and your ongoing pain. Chemical changes happen in the brain and spinal cord to re-route signals to pain centres in the brain. Normal sensation such as movement, touch, pressure, stretch, hot, cold can therefore all be felt as pain. Sometimes the pain system can be activated without even any physical stimulus-by changes in the weather, by mood and thoughts or even no stimulus at all. For example, some people might notice that their pain becomes worse during the rainy season which may be linked to their thoughts, feelings or the activities they perform during this period. It is as if the nervous system can make its own pain…’

(Facilitate discussions by asking for participants’ understanding of the previous paragraph- you are looking for the understanding that acute pain equals damage but chronic back pain that is not due to a particular disease is not equal to damage. Facilitate their understanding that many things not related to injury can stimulate chronic pain such as anticipation of pain)

‘…You need to understand what makes your pain worse. If you are able to recognise all the different factors that can contribute to your pain experience, you can learn techniques to deal with them better. Examples include physical demands on your body such as over-exertion, not doing enough physical activity such as under-exertion, stress, anger, fatigue, anxiety and low mood. You can be empowered to control your pain. You can turn your pain up and down. Have you ever had an injury and not felt it at the time? The nervous system is very good at filtering information. In extreme situations such as danger, your brain and spinal cord which is your nervous system have to filter out what it doesn’t consider as important at the time. It can filter out pain signals. The nervous system releases natural pain killing chemicals into the blood stream and these can reduce pain signals. The natural pain killing system doesn’t just occur in an emergency. In normal life when you are not stressed and are in control of your pain, the brain also releases these pain killing chemicals constantly into the bloodstream. However, the nervous system may see pain as a threat and can trigger a state of alertness which is called the stress response. When the body is in this state of alertness, it will look out for any pain signals and odd sensations throughout the body. It can choose to highlight this information as pain information instead of filtering it out. When this occurs, the brain stops releasing the natural pain killing chemicals and releases stress hormones into the bloodstream. In the long term, this stress response can make your pain worse. It can cause changes to muscle tension, blood pressure and breathing rate.

(Facilitate discussion by exploring participants’ understanding of the above paragraph- you are looking for their understanding that they can control their pain to a large extent. They can turn their pain up and down with their thoughts, mood and actions)

‘…Research has shown that the more you are unaware of why you have pain, the less confident you are to deal with it; and the more worried you are about your pain, the more you will activate your brain’s pain centres and the more you will switch off your brain’s painkilling system. For instance, some people may say that they don’t know what is causing their back pain because they have tried every treatment but nothing has worked for them. This thought can stimulate anxiety which can increase their pain experience. On the other hand, the more confident you are to deal with your pain, and
the more you are in control of it, the more you will activate your brain’s painkilling system. From our discussions, you have seen that chronic pain is not equal to damage but requires that you find out the things that make your pain worse and learn how to avoid aggravating your pain in your daily life. Therefore, it is important for you to manage your back pain like people with chronic conditions like diabetes and hypertension by positive thinking, avoiding aggravating factors, and adopting proper self-management strategies to manage the symptoms. The more confident you are to deal with your pain, the less worried you are and the more you are in control of it, the more you will activate your body’s natural pain killing systems…’

(Facilitate group discussion by exploring participants’ understanding of the above paragraph-look for their understanding that their chronic back pain is under their control and that they are now learning the skills with which they can control their pain)

BREAK: 15 minutes. Snacks are shared.

Phases 2, 3 and 4 (45 minutes)

Phase 2: Mapping of existing illness perceptions

(Use these principles of assessment-facilitate participants to identify their illness beliefs, then link these beliefs into the vicious cycle of beliefs/thoughts leading giving rise to mood leading to physical sensations giving rise to particular behaviour which leads to the impact of back pain in participants’ lives).

‘…Some people have been looking for a cure for their back pain…’

‘…How has this worked for you…?’

‘…Why do you think this has not worked for you…?’

‘…How does this make you feel emotionally?

‘…Do you have any particular sensation on your body when you are feeling this way…?’

‘…How do you behave when you are thinking, feeling or having the sensation on your body…?’

Phase 3: Challenging maladaptive illness perceptions

(At this point stimulate participants to question their own illness perceptions and the associated behaviour patterns (including ‘maladaptive’ behaviour) to explore if there is any utility in having these perceptions. These have to be discovered by the participants themselves)

‘…What effect do you think this behaviour will have on your back pain…?’

‘…Do you like this impact on your life…?’
‘...Is there a cure for back pain...?’
‘...do you think there might be better ways of thinking and behaving in response to your back pain...?’

Phase 4: Formulation of alternative illness perceptions and associated behaviours
(Acknowledge an understanding of participants’ point of view and help them to discover alternative ways of thinking about their concerns. Ask and answer participants’ questions to stimulate critical thinking and to illuminate ideas. Facilitate modification of maladaptive illness perceptions into alternative perceptions conducive to achieving their life goals. Facilitate an understanding of the ability of participants to influence their own behaviour and environment)

‘...I want everyone to tell me your life’s goals? Why are you here? What do you want this programme to achieve for you?’

‘...I understand your beliefs/thoughts, your mood…it can be frustrating when everything you believe should cure your back pain hasn’t worked...’

‘...based on everything we have talked about, in what better ways can you think about your back pain...?’

‘...What is the best treatment for your back pain...?’

‘...If you are thinking this way, what actions do you think you are going to take in relation to your back pain...?’

‘...what effects do you think this new behaviour will have on your back pain...?’

‘...in what way would you think about your back pain, that would make you want to do exercises or modify the way you do your functional/daily activities or control your thoughts and emotions...?’

Phase 5: Practising alternative (desired) behaviour in a supervised session (35 minutes)
(Facilitate the practising of alternative/desired) behaviour in a supervised session. The exercise and postural training sessions are done in a group. Start with warm up exercises—the same for all the sessions. Then the selected exercises for the day. This is followed by the selected postural training. Then finally the cool down exercises—the same for all the sessions)

‘...we are now going to carry out some activities that agree with that better way of thinking about your back pain...’

(Organise participants so that each person is starting in a particular station. All participants will be performing the same activity at the same time. Each participant will have 1 mat placed on the floor with a chair and stool).

‘...each person will stay on his/her station and by the end of this phase, you should have done all the exercises...’
Warm up exercises (5 minutes):
Marching on the spot
Shoulder rotations
Middle back stretch
Quadriceps stretch
Calf stretch
Hamstring stretch

Main exercises and functional activity training (15 minutes):
Back extension in standing to back arching on all fours to superman (4 minutes).
Back extension with leg lift to bridging to improvised wobble board. (4 minutes).
Mopping the floor to working/writing on a table to brushing the teeth in standing (3 minutes) to farming correctly to carpentry work with correct posture

Relaxation exercises: relaxed breathing while lying supine with deep muscle relaxation. Participants breathe in through the nose and breathe out through the mouth while focusing all their thoughts on breathing (they should avoid distracting thoughts and return their focus when distracted) (4 minutes)

Cool down exercises (5 minutes):
Marching on the spot
Shoulder rotations
Middle back stretch
Lower limb rotations while lying down
Hamstring stretch while lying down
Quadriceps stretch while lying down
Gluteal stretch while sitting down
Inner thigh stretch while sitting down

‘...We will now do one little exercise before we all eat and then go home...’

(For the final 10 minutes of this session, participants are then encouraged to explore alternative illness perceptions in their daily lives outside of the supervised sessions that will help them to maintain these activities in their daily lives)

‘...could you tell me how you need to think to enable you sustain these activities on your own...?’

‘...what was your experience doing these activities on your own after the previous sessions...?’

‘...is there anything in your life that needs to be different for you to sustain performing these activities on your own for this week...?’
(Subsequently, a plan for change is developed followed by exploring the incorporation of behaviour change into daily lives.

Use ‘Elicit-provide-elicit’ techniques: that is find out what they know, give information where necessary and find out what they know. Facilitate the change talk by identifying and strengthening comments that show the desire to change, ability to change, reasons for change, need to change, commitment to change and taking steps towards behaviour change.

Focus at an individual level, on the most relevant area for each participant. Facilitate motivation to change the important areas by discussing outcome expectancies associated with the behaviour change, explore individual patient’s risk awareness and self-efficacy.

Set SMART goals needed to achieve the required behaviour change. Plan with the patient, the steps required to achieve the listed goals required for the desired behaviour change.

Use action planning/set plans for action by identifying with the patients which activities, and when and how many times the activities need to be performed.

Use social support to facilitate behaviour change by allowing each participant to identify a family/friend to support him/her on the journey towards change.

‘...what benefits do you think these activities will have in your life...?’

‘...What benefits have these activities had so far in your life...?’

‘...each person needs to make a plan on how to include these activities in their lives...’

‘...what are your plans...? do you have anyone that has been supporting you in these plans...?’

Break: 15 minutes. Lunch is provided

Phase 6: Testing of alternative illness perceptions and associated behaviours which will be strengthened by confirming their utility in daily life (10 minutes)

(Behavioural experiments- participants will practice identified behaviour change and appraise their efficacy in their daily lives outside the session. Participants are asked to assess the effectiveness of these alternative illness perceptions and behaviour so that they can be discussed during the next session)

‘...For the rest of this week, I want you to practice all we have done today in your homes and in your work places. You can adapt these activities to suit your individual home or work environments...’

‘...assess how useful any of these activities are in your lives...I will ask you about them during the next session...’
(There is exploration of personal and social/environmental factors that constitute barriers and facilitators (determinants) to engaging in the desired behaviour change. Strategies to utilize the facilitators and reduce barriers to the desired change will be explored with the participant. Culturally tailored goals are then set for personalised strategies to overcome identified barriers. Facilitate initiative and maintenance for the behaviour change and attending the next group session and reminders for exercises and functional activity modification, with snacks and lunch as the incentives for the group sessions)

‘...before we finish today’s session, do you think there might be barriers to doing these activities on your own for this week...what are they...?’

‘...what barriers did you encounter doing the activities given in the previous sessions?’

‘...are there things that might help you in carrying out these activities on your own...?’

‘...What helped you reduce these barriers in the previous weeks...?’

‘...how can we reduce these barriers and increase the things that will help you maintain these activities for this week...?’

‘...Could each person give me the numbers of any one that will be supporting you on this journey to change?

END OF SESSION 5-WEEK 5

Session 6 (Week 6/Theme 6): Managing and coping with flare ups, relaxation, help seeking and self-management

Phase 1: Education (30 minutes)

(Physiotherapist asks all participants to bring out the patient booklet. Physiotherapist facilitates an interactive educational session (‘chunk-check-chunk’) guided by the physiotherapist booklet).

‘...This session will help you to create a toolbox of things that you might be able to do to deal with flare ups. Remember that we said earlier that chronic pain just like other chronic conditions is not cured but managed on a day to day basis. Therefore, there will be days when you will have little or no symptoms-what some people call their ‘good’ days and other days that your symptoms might be worse- what you might call your ‘bad’ days. A flare up is a temporary increase in pain or return of symptoms. The duration of a flare up may vary from a few hours to some weeks but they are always time limited. During a flare up, you might experience symptoms such as pain, swelling, stiffness, spasm, weakness, tingling, burning, aching, and locking. Most often, it is usually a symptom you have experienced before. You might begin to wonder why you get flare ups. Some people may start thinking it is spiritual or caused by someone-this understanding is false and unhelpful. It is often because you have done too much or too little. Most people can think back to a change in activity or a situation where they did too much or something new. However, pain can fluctuate randomly and sometimes you
will not be able to identify why your pain has increased. Things like stress, anxiety, colds or flu can initiate a flare up. In a flare up, you may wonder if you have damaged/hurt yourself or if someone placed a spiritual spell on you—this is not the case. No, you have not. If you run a marathon, without training for it, you would not be surprised to have some days of severe pain as a result. Have you damaged yourself in such a situation? No. You have taken your body outside its normal tolerance limits. The pain is to let you know that…'

(Facilitate discussion by finding out participants’ understanding of the above paragraph—look for the understanding that their pain intensity will likely fluctuate and that most times they might be able to link this to a specific activity and a few times they might be unable to link it to any particular activity. They need to understand that this is normal and they should not be worried by this)

‘...You need to work out a personal plan by creating a list of things that you could try when you have had a flare up to try and manage your symptoms until they improve. The first things to consider are warning signs. You could start with thinking about possible warning signs—sometimes there may be none. The second thing to consider is pacing or modifying your activities. If it is a case of overdoing it, try to modify your routine to avoid worsening your symptoms. The third thing to consider is symptom management. What can you do to help with your symptoms—but remember that prevention is better than cure. It better to prevent a flare up if and when you can than trying to manage a flare up. Things like pain killers, heat, stretching, gentle exercise, warm baths may be helpful. Remember that pain killing drugs should be for the short term. You should not become drug dependent such that you become unable to perform your daily activities without drugs. Remember that drugs do not cure back pain! Please those taking drugs for other conditions such as hypertension, diabetes etc. must continue with their drugs as prescribed by their doctors. You could also do nice distracting things that could help ease your pain such as warm bath, visiting friends, praying or relaxation…’

(Facilitate discussion by finding out participants’ understanding—you are looking for 3 important things: warning signs, activity modification but not underdoing or overdoing and symptom management)

‘...Consider challenging your thoughts—the thoughts that might increase your pain experience. Use the tools we thought you. If you are unable to challenge your own thoughts, have the name of a friend or family member you can contact who can help you through a flare-up, to challenge your negative thoughts. Please know that advising yourself is very important. What motivating comments can you think about that might help you to manage when flare ups occur? Consider how far you have come, what you are aiming for, and why stopping and taking to bed won’t help. Don’t forget the overdoing-underdoing (‘doing too much to doing too little’) cycle. You need to consider how to restart exercise after a flare up. Whilst feeling worse, what can you still do? When you feel better, start low and rebuild. You could start with regular stretching and build back up. Have your flare up plan to use whenever you need it. Make it suitable to your needs. When you are having a flare up, don’t panic. Any added stress or tension will build up in the muscles. Sore joints will feel worse if tense muscles are surrounding them. Muscles tense up when you panic or are anxious. Try the relaxation/breathing exercises that we have thought you and know that you got through a flare up before, you will get through it this time.
Facilitate discussion by exploring participants’ understanding of the previous paragraph—emphasis is laid on their understanding that flare ups will most likely occur but that participants have the ability to limit the impact in their lives. Two important ways of doing this is by challenging any negative thoughts/moods/behaviour that increase the flare up or are associated with the flare up and doing relaxation exercises.

‘...There are two ways to produce our own pain killers naturally: exercise and relaxation. Research has shown that the ability to relax deeply is vital to our emotional well-being and physical health. As the pace of life continues to increase, relaxation may be used as a simple way of reducing tension, stress and anxiety. Relaxation can also be an extremely effective tool in the management of chronic pain. You will be taught some relaxation techniques that you can use on your own. You can get similar benefits from doing activities you enjoy. Ask yourself what sorts of activities you enjoy doing. These could include, going for a walk when the sun is down, fellowship activities, praying, exercising, singing, visiting friends, having other hobbies and interests. Relaxation can be any activity that makes you feel happy and rested. It can be different things for different people and one type won’t suit everyone. Sleep is another very important factor to consider. Do you have problems with sleeping? Do you experience greater levels of stress and pain when you are tired? It is important to get restful sleep. Bedtime is a time with fewer distractions so worrying negative thoughts have the opportunity to come through. There are a few pointers to help you sleep better—this is called sleep hygiene. Exercising, especially in the afternoons can enhance sleep. Use your bed and bedroom for sleep only. Before going to bed, note any problems of the day or unfinished task and decide the next action you will take to address these. Unfinished business like these can disturb your sleep—so do not let it! Perform a relaxation session before going to sleep. If you wake up in the night worrying, note that problem to deal with it the next day. If you are lying awake for 20 minutes, don’t keep checking the time, get up and do something relaxing. If you are not tired when you go to bed, get up earlier in the mornings. Try to go to bed early. Quality of sleep before midnight is better than after midnight. In the practical sessions, we have taught you some deep breathing exercises and you are also going to learn some simple progressive muscle relaxation exercises today. You can also use meditation—being in a quiet place with your mind blank, focusing only on your breathing. Giving yourself time to relax may help you manage better on a daily basis. Relaxation should form part of each day to keep stress and the negative effects of stress at bay. Try for yourself to find something that relaxes you and practice using it regularly. As you learn to relax your body, do not forget to challenge unhelpful thoughts. A flare up can be a worrying time and it is important not to let negative thoughts hinder your progress. Remember that pain does not necessarily mean damage and hurt does not always mean harm. Setbacks are a common part of the recovery process and will give you valuable information about your body and its tolerance levels. Don’t be discouraged! Remember your flare up will pass. Also, do not forget to pace and plan your day. If possible, rearrange activities to allow you to pace more effectively. This is often hard to do. Try and keep at least one pleasure activity.

(Facilitate discussion by exploring participants’ understanding that gentle exercises, relaxation and challenging negative thoughts are the most potent tools for managing flare ups)

‘...There are other things that might also work for you. Remember that these activities are for temporary pain relief and do not cure back pain. Heat or ice may be helpful for
you. Muscle spasm is often the main source of pain during a flare up, it is the body’s way of protecting itself, although sometimes it can be over-protective. Heat is often helpful to release painful muscle spasms and allow the muscles to relax. Cold is considered better for initial acute pain and the cold will help settle any temporary inflammation that has occurred. Long term inflammation is not helpful, so it is important to help inflammation settle down as quickly as possible. Stretching is also helpful. Tight muscles are a common source of unnecessary pain. It’s important to gently stretch these out as soon as possible. Gentle controlled stretching can help release any muscle spasm. Remember the stretching exercises we have been doing during the sessions. It helps if your muscles are warm before you stretch them. After a warm bath or a gentle activity is good. You need to understand how to gradually restore full movement. Avoiding movement as a result of pain is often the worst thing you can do. Give your body the right message that movement is good by continuing your exercises. Resist the temptation to avoid anything that may bring on the pain especially during a flare up. Adjust how far you move into the exercise. If you are not managing properly, reduce the number of exercises to half but immediately plan a gradual build up back to your normal amount over the next few days following the flare up. It takes patience and confidence to keep going, without overdoing it. It is important to find the right balance between too much and too little. Make your own setback or flare up plan-which you can keep improving upon with experience.

(Facilitate discussion to enhance the participants’ understanding that there are other passive things that can help them to temporarily manage their flare-up but that most important is the active behaviour adaptation to prevent flare ups when possible or manage them. They need to understand the need to avoid ‘underdoing’ during the flare up which will likely result into ‘overdoing’ in a vicious cycle. Participants need to understand the importance of planning ahead for flare ups)

BREAK: 15 minutes. Snacks are shared.

Phases 2, 3 and 4 (45 minutes)

Phase 2: Mapping of existing illness perceptions
(Use these principles of assessment- facilitate participants to identify their illness beliefs, then link these beliefs to the vicious cycle of beliefs/thoughts giving rise to mood changes which may lead to physical sensations giving rise to particular behaviour which influences the impact of back pain in participants’ lives).

‘... Is there any other belief you have had about your back pain that we have not discussed since we started this programme...?’

‘... How is today’s lesson different from how you have been regarding your back pain...?’

‘...Some people may have been regarding and treating their back pain as an acute condition...’

‘...How has this worked for you...?’
‘…Why do you think this has not worked for you…?’

‘…How do you think this makes you feel emotionally?

‘…Do you have any particular sensation in your body when you are feeling this way…?’

‘…How do you behave when you are thinking, feeling or having the sensation in your body…?’

Phase 3: Challenging maladaptive illness perceptions

(At this point stimulate participants to question their own illness perceptions and the associated behaviour patterns (including ‘maladaptive’ behaviour) to explore if there is any utility in having these perceptions. These have to be discovered by the participants themselves)

‘…What effect do you think this behaviour will have on your back pain…?’

‘…Do you like this impact on your life…?’

‘…what is the main difference between acute and chronic conditions in terms of how they are addressed…?’

‘…do you think there might be better ways of thinking and behaving in response to your back pain…?’

Phase 4: Formulation of alternative illness perceptions and associated behaviours

(Acknowledge an understanding of participants’ point of view and help them to discover alternative ways of thinking about their concerns. Ask and answer participants’ questions to stimulate critical thinking and to illuminate ideas. Facilitate modification of maladaptive illness perceptions into alternative perceptions conducive to achieving their life goals. Facilitate an understanding of the ability of participants to influence their own behaviour and environment)

‘…I want everyone to tell me your life’s goals? Why are you here? What do you want this programme to achieve for you?’

‘…I understand your beliefs/thoughts, your mood…it can be frustrating when nothing seems to have worked for your back pain…’

‘…based on everything we have talked about, in what better ways can you think about your back pain…?’

‘…What is the best treatment for your back pain…?’

‘…If you are thinking this way, what actions do you think you are going to take in relation to your back pain…?’

‘…what effects do you think this new behaviour will have on your back pain…?’

‘…in what way do you need to think about your back pain, that would make you want to do exercises or modify the way you do your functional/daily activities or control your thoughts and emotions…?’

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Phase 5: Practising alternative (desired) behaviour in a supervised session (35 minutes)

(Facilitate the practising of alternative/desired) behaviour in a supervised session. The exercise and postural training sessions are done in a group. Start with warm up exercises-the same for all the sessions. Then the selected exercises for the day. This is followed by the selected postural training. Then finally the cool down exercises-the same for all the sessions)

‘...we are now going to carry out activities that are in line with this better way of thinking about your back pain...’

(Organise participants so that each person is starting in a particular station. All participants will be performing the same activity at the same time. Each participant will have 1 mat placed on the floor with a chair and stool).

‘...each person will stay on his/her station and by the end of this phase, you should have done all the exercises for the day...’

Warm up exercises (5 minutes):
Marching on the spot
Shoulder rotations
Middle back stretch
Quadriceps stretch
Calf stretch
Hamstring stretch
Main exercises and postural training (15 minutes):
Half lying on elbows, to modified press-up, to back extension with shoulder lift, to alternate leg and arm stretch (4 minutes).
Alternate hip and knee flexion (progressing to cycling in the air), to single knee to chest, to double knees to chest, to trunk rotation (4 minutes).
Relaxation exercises: Patients contract all their muscles simultaneously (1 minute), then relax their muscles (1 minute) for 3 cycles. This is followed by relaxed breathing while lying supine with deep muscle relaxation. Participants breathe in through the nose and breathe out through the mouth while focusing all their thoughts on breathing (they should avoid distracting thoughts and return their focus when distracted) (3 minutes)
Correct sitting posture, to correct standing, to correctly lifting a weight from the ground to sitting correctly on the chair to better posture during farming to better posture during carpentry work to better posture during ironing (4 minutes)

Cool down exercises (5 minutes):
Marching on the spot
Shoulder rotations
Middle back stretch
Lower limb rotations while lying down
Hamstring stretch while lying down
Quadriceps stretch while lying down
Gluteal stretch while sitting down
Inner thigh stretch while sitting down
‘...Finally before we all eat and then go home…’
(For the final 10 minutes of this session, participants are then encouraged to explore alternative illness perceptions in their daily lives outside of the supervised sessions that will help them to maintain these activities in their daily lives)
‘...could you tell me how you need to think to enable you sustain these activities on your own...?’
‘...what was your experience doing these activities on your own after the previous sessions...?’
‘...is there anything in your life that needs to be different for you to sustain performing these activities on your own for this week...?’

(Subsequently, a plan for change is developed followed by exploring the incorporation of behaviour change into daily lives.
Use ‘Elicit-provide-elicit’ techniques: that is find out what they know, give information where necessary and find out what they know. Facilitate the change talk by identifying and strengthening comments that show the desire to change, ability to change, reasons for change, need to change, commitment to change and taking steps towards behaviour change.
Focus at an individual level, on the most relevant area for each participant. Facilitate motivation to change the important areas by discussing outcome expectancies associated with the behaviour change, explore individual patient’s risk awareness and self-efficacy.
Set SMART goals needed to achieve the required behaviour change. Plan with the patient, the steps required to achieve the listed goals required for the desired behaviour change.
Use action planning/set plans for action by identifying with the patients which activities, and when and how many times the activities need to be performed.
Use social support to facilitate behaviour change by allowing each participant to identify a family/friend to support him/her on the journey towards change)
‘...what benefits do you think these activities will have in your life...?’
‘...What benefits have these activities had so far in your life...?’
‘...each person needs to make a plan on how to include these activities in their lives...’
‘...what are your plans...? Who has been supporting you in these plans...?’
Break: 15 minutes. Lunch is provided

Phase 6: Testing of alternative illness perceptions and associated behaviours which will be strengthened by confirming their utility in daily life (10 minutes)

(Behavioural experiments- participants will practice identified behaviour change and appraise their efficacy in their daily lives outside the session. Participants are asked to assess the effectiveness of these alternative illness perceptions and behaviour so that they can be discussed during the next session)

‘...As today is our final session, I need you to ask me any questions you may have about your back pain...’

‘...The most important thing for you is to be empowered to find out what works for your back pain...’

‘...you may try different strategies before you find the one that works best for your back pain...’

‘...you know your body more than anyone, so you have the ability to understand and effectively manage your back pain...’

(There is exploration of personal and social/environmental factors that constitute barriers and facilitators (determinants) to engaging in the desired behaviour change. Strategies to utilise the facilitators and reduce barriers to the desired change will be explored with the participant. Culturally tailored goals are then set for personalised strategies to overcome identified barriers)

‘...Have you been able to overcome the barriers you encountered doing the activities given in the previous sessions?’

‘...What helped you overcome these barriers in the previous weeks...?’

‘...how can we reduce these barriers and increase the things that will help you maintain these activities for this week...?’

‘...As we are ending the session, how will you make your lifestyle modification a permanent part of your daily life...?’

END OF SESSION 6-WEEK 6

(END OF PROGRAMME)
Chinonso Igwezi-Chidebe

14 August 2015

Dear Chinonso,

The Development and preliminary evaluation of a self management programme for people with non-specific chronic low back pain in rural Nigeria

Study Reference: HE-14/15-156

I am pleased to inform you that full approval for your project has been granted by the Biomedical Science, Dentistry, Medicine and Natural & Mathematical Sciences Research Ethics Subcommittee.

Please ensure that you follow all relevant guidance as laid out in the King’s College London Guidelines on Good Practice in Academic Research (http://www.kcl.ac.uk/college/policyzone/index.php?id=147). For your information, ethical approval is granted until 14/09/2015. If you need approval beyond this point, you will need to apply for an extension at least two weeks before this. You will be required to explain the reasons for the extension. However, you will not need to submit a full re-application unless the protocol has changed. If you have been granted approval for only 12 months, you will not be sent a reminder when it is due to lapse.

Ethical approval is required to cover the data-collection phase of the study. This will be until the date specified in this letter. However, you do not need ethical approval to cover subsequent data analysis or publication of the results.

For secondary data-analysis, ethical approval is applicable to the data that is sensitive or identifies participants.

Approval is applicable to periods in which such data is accessed or evaluated.

Please note you are required to adhere to all research data/records management and storage procedures agreed to as part of your application. This will be expected even after the completion of the study.

If you do not start the project within three months of this letter, please contact the Research Ethics Office.

Please note that you will be required to obtain approval to modify the study. This also encompasses extensions to periods of approval. Please refer to the URL below for further guidance about the process:

http://www.kcl.ac.uk/innovation/research/support/ethics/applications/alterations.aspx

Please would you also note that we may, for the purposes of audit, contact you from time to time to ascertain the status of your research.

If you have any query about any aspect of this ethical approval, please contact the Research Ethics Office: (http://www.kcl.ac.uk/innovation/research/support/ethics/contact.aspx)

We wish you every success with this work.

Yours sincerely,

Senior Research Ethics Officer

For and on behalf of

Chair of the Biomedical Science, Dentistry, Medicine and Natural & Mathematical Sciences Research Ethics Subcommittee
ETHICAL CLEARANCE CERTIFICATE

TOPIC: DEVELOPMENT AND PRELIMINARY EVALUATION OF A SELF MANAGEMENT PROGRAMME FOR NON-SPECIFIC CHRONIC LOW BACK PAIN IN RURAL NIGERIA

BY: IGWESI-CHIDOBEN, CHINONSO N.

FOR: A PhD PROPOSAL OF THE DEPARTMENT OF PHYSIOTHERAPY, SCHOOL OF MEDICINE, KINGS COLLEGE LONDON, UNIVERSITY OF LONDON, UK

This research project on the above topic was reviewed and approved by the University of Nigeria Health Research Ethics Committee. This certificate is valid for one year from date of issue.

Prof. R.E. Umeb
Chairman Health Research Ethics Committee

Date: 28th August, 2013.
APPENDIX 33: INFORMATION SHEET FOR
FEASIBILITY STUDY

REC Reference Number: HR-14/15-1565

YOU WILL BE GIVEN A COPY OF THIS INFORMATION SHEET

Title of study: Investigating the acceptability of a self-management programme for people with chronic low back pain in rural Nigeria.

I would like to invite you to participate in this research project which forms part of my PhD research. You should only participate if you want to; choosing not to take part will not disadvantage you in anyway. Before you decide whether you want to take part, it is important for you to understand why the research is being done and what your participation will involve. Please listen to me as I explain this to you. You or your significant other can take time to read the following information carefully and discuss it with others if you wish. Ask me if there is anything that is not clear or if you would like more information.

The overall purpose of this study is to assess the feasibility and acceptability of a treatment we developed for people with back pain.

In the past, I visited this community several times for other research which helped us to develop a new form of treatment for your chronic low back pain. The aim of this research is to check if this new treatment will be acceptable by you and effective for your chronic low back pain. This study might be useful in the future for people living with chronic low back pain in rural Nigeria.

I am inviting people aged 18 to 69 years, who have had low back pain that has lasted for more than 12 weeks. Pregnant women are not eligible for this study.

Participation in this research is voluntary. You do not have to take part. I will explain all the information in this document. You or your significant other should read this information sheet and if you have any questions you should ask me. You should not agree to take part in this research until you have had all your questions answered satisfactorily.

If you decide to take part you will be given this information sheet and consent form to keep and will be asked to sign the consent form on a later day. At a time convenient for you, I will then invite you back to this community centre to obtain your informed consent and ask you questions that will determine if you can participate in this research. You will give informed consent by either signing or thumb printing on the consent form you were given. We will decide on a day convenient for you to test your back pain at the health centre. I will then assign you randomly to a treatment group. I might ask you brief questions to understand
the impact of your back pain on your life depending on the treatment group you fall into.

There are only two possible treatment groups you may be assigned to. Participants will be given a small book with pictures of exercises that they will be doing. In addition, participants in the second group will be invited to a group based exercise programme. In the sessions, participants will be given education about back pain. Participants will have discussions together and with the researcher. The researcher will give them different exercises and assignments to do at home. The group exercise sessions will last for 6 weeks and will be done once weekly. At the end of 6 weeks, we will decide on a convenient day that the researcher will take the same measurements taken at the beginning of the study. The researcher will then advise participants in this group to continue with the exercises and assignments they were given during the group exercise sessions.

PLEASE NOTE: If you decide to participate in this study, you are expected to accept whatever treatment group you are assigned to.

There is no financial incentive to participate in this research however I will give you travel expenses and provide snacks and lunch on the days we meet for the assessment of your back pain and/or the group exercises. All treatments will be provided to participants free of charge.

There are no foreseeable risks in participating in the study. The main disadvantage to taking part in the study is that you will be donating around two and half hours of your time every week for 6 weeks to take part, for participants assigned to the treatment group. Participants in the first group will have very little of their time taken by this research as the researcher will only engage with them 2 times to assess their back pain and ask them questions about their back pain. However, we believe that the benefits you will receive from this research will be greater that the discomfort you might experience.

There might be no direct benefits to taking part. However, the information I get from the study will help to develop a treatment for chronic low back pain in rural Nigeria

Every information collected during this study is regarded as strictly confidential and will be held securely until the research is finished. Your participation is entirely voluntary. If you change your mind, you are free to stop your participation and to have your data withdrawn without giving any reason up to the point of publication in 12/08/2016. All data for analysis will be anonymised. In the reporting of the research findings, I will not reveal the names of any participants or the organisation where you work. At all times there will be no possibility of you as individuals being linked with the data. The UK Data Protection Act 1998 will apply to all information gathered during this study and held on password-locked computer files and locked cabinets within King’s College London. No data will be accessed by anyone other than me and my supervisors; and anonymity of the material will be protected by using codes. No data will be able to be linked back to any individual taking part in the research. You may withdraw your data from the project anytime up to the point of publication in 12/08/2016. All recordings of data on audio-equipment will be deleted after transcription. If you ask me to withdraw your data at any time before 12/08/2016, I will remove all traces of it from the records.
This PhD research is funded by the University of Nigeria and the Schlumberger foundation. The study has been approved by the King’s College London Research Ethics Committee and University of Nigeria Teaching Hospital Ethics committee.

I will produce a final report summarising the main findings, which will be sent to you if you wish. I also plan to disseminate the research findings through publication and conferences in both England and Nigeria.

If you have any questions or require more information about this study, please contact me using the following contact details:

Chinonso. N. Igwesi-Chidobe,
Department of Physiotherapy,
Division of Health & Social Care Research,
Faculty of life sciences and Medicine,
King’s College London
London SE1 1UL
United Kingdom.
E-mail: chinonso.igwesi-chidobe@kcl.ac.uk
Phone number: +44 207 848 6679

If this study has harmed you in any way or if you wish to make a complaint about the conduct of the study you can contact King’s College London using the details below for further advice and information:

Dr Emma Godfrey,
Department of Physiotherapy,
Division of Health & Social Care Research,
Faculty of life sciences and Medicine,
King’s College London
London SE1 1UL
United Kingdom.
E-mail: emma.l.godfrey@kcl.ac.uk
Postal address: SE1 1UL
Phone number: +44 20 7848 6283
APPENDIX 34: CONSENT FORM FOR FEASIBILITY STUDY

Please complete this form after you have read the Information Sheet and/or listened to an explanation about the research.

Title of Study: Investigating the acceptability of a self-management programme for people with chronic low back pain in rural Nigeria.

King’s College Research Ethics Committee Ref: HR-14/15-1565

Thank you for considering taking part in this research. The person organising the research must explain the project to you before you agree to take part. If you have any questions arising from the Information Sheet or explanation already given to you, please ask the researcher before you decide whether to join in. You will be given a copy of this Consent Form to keep and refer to at any time.

Please tick or initial

I confirm that I understand that by ticking/initialling each box I am consenting to this element of the study. I understand that it will be assumed that unticked/initialled boxes mean that I DO NOT consent to that part of the study. I understand that by not giving consent for any one element I may be deemed ineligible for the study.

1. *I confirm that I have read and understood the information sheet dated 12/08/2015 for the above study. I have had the opportunity to consider the information and asked questions which have been answered satisfactorily.

2. *I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason. Furthermore, I understand that I will be able to withdraw my data up to 12/08/2016

3. *I consent to the processing of my personal information for the purposes explained to me. I understand that such information will be handled in accordance with the terms of the UK Data Protection Act 1998.

4. *I understand that my information may be subject to review by responsible individuals from the College for monitoring and audit purposes.
5. I understand that confidentiality and anonymity will be maintained and it will not be possible to identify me in any publications

6. I agree to be contacted in the future by King’s College London researchers who would like to invite me to participate in follow up studies to this project, or in future studies of a similar nature.

7. I understand that the information I have submitted will be published as a report and I wish to receive a copy of it.

8. I consent to my interview being audio/video recorded.

9. I understand that I must not take part if I fall under the exclusion criteria as detailed in the information sheet and explained to me by the researcher.

10. I have informed the researcher of any other research in which I am currently involved or have been involved in during the past 12 months

11. I agree to maintain the confidentiality of focus group discussions

12. I understand that confidentiality cannot be guaranteed during the [focus group and group intervention]

__________________               __________________
Name of Participant               Date
Signature/thumb print

__________________               __________________
Name of Researcher                 Date
Signature
APPENDIX 35: INTERVIEW GUIDE FOR FEASIBILITY STUDY

1. Were you told about the treatments that people in the intervention group received? (control group only)

2. Did you do the treatments including the exercises that those in the intervention group were doing? List them all.

3. What are your views of the treatments you or those in the intervention group received? Where did you receive treatments for your back pain?

4. What did you think about the treatment being group-based? (only for the SMP group)

5. What did you think of the venue where you received the treatment?

6. What did you like best about the treatment?

7. Was there anything you did not like about the treatment?

8. What day and time do you think would be appropriate for the treatment?

9. Who would you prefer to deliver this treatment?

10. Would you accept a lay person delivering this intervention?

11. What influenced your either carrying out or not carrying out your home assignments?

12. What could be done to improve the treatment?

Appendix 4a
Prescribed Exercise Questionnaire

Healthcare providers normally recommend that people with chronic health conditions do exercises and/or activities to improve their quality of life and manage their condition. People often find their own way of doing their exercises/activities. We would like you to tell us how you do yours.

Please tick all of the boxes that apply to you.

1) What exercise/activity have you been asked to do?

   Personal exercise sessions with a healthcare professional [ ]

   Group exercise sessions [ ]
Individualised exercises to do at home, as recommended by a health care professional

Doing regular exercise in general  
Walking  
Staying active in your daily life  
Other  

2) How often have you been asked to do these exercises and/or activities?

Every day  
4 to 6 days a week  
2 to 3 days a week  
1 day a week  
Less than this  
Other  

3) For how long have you been asked to continue doing these exercises and/or activities?

Ongoing  
For a fixed duration (please specify)  
Other (please state)  

4) How often are you doing these exercises and/or activities?

Every day  
4 to 6 days a week  
2 to 3 days a week  
1 day a week  

5) If you have stopped doing your exercises/activities, when did you stop and why?

6) In your own words, please can you explain why you have, or have not, done your exercises?
APPENDIX 36: REFLECTIVE DIARY (FEASIBILITY STUDY)

01-10/11/2015

Potential participants are all interested in getting the multivitamin tablets. The use of drugs (most predominantly opioids such as tramadol) for managing back pain is very salient in this community. It appears that the people that want to participate in this study are only interested because of the multivitamin tablets they will get at the end of the study.

Participants in the self-management group are being shamed for doing exercises as a strategy for managing their pain. They are now reluctant to wear their shorts for the group exercise sessions. People in the community kept asking to see the drugs they were given for their pain. It does appear that communities’ beliefs and attitudes towards exercises for managing back pain may influence participants’ exercise-related behaviour in the short or long term, or both.
APPENDIX 37: PUBLISHED ARTICLES

Effective components of exercise and physical activity-related behaviour-change interventions for chronic non-communicable diseases in Africa: protocol for a systematic mixed studies review with meta-analysis

Chinonso N Igwesi-Chidobe,1,2 Emma L Godfrey,1,3 Andre P Kenne4,5

ABSTRACT

Introduction: Chronic non-communicable diseases (NCDs) account for a high burden of mortality and morbidity in Africa. Evidence-based clinical guidelines recommend exercise training and promotion of physical activity behaviour changes to control NCDs. Developing such interventions in Africa requires an understanding of the essential components that make them effective in this context. This is a protocol for a systematic mixed studies review that aims to determine the effective components of exercise and physical activity-related behaviour-change interventions for chronic diseases in Africa, by combining quantitative and qualitative research evidence from studies published until July 2015.

Methods and analysis: We will conduct a detailed search to identify all published and unpublished studies that assessed the effects of exercise and physical activity-related interventions or the experiences/perspectives of patients to their interventions for NCDs from bibliographic databases and the grey literature. Bibliographic databases include MEDLINE, EMBASE, CENTRAL (Cochrane Central Register of Controlled Trials), PsycINFO, GINAH, and Web of Science. We will include the following African regional databases: African Index Medicus (AIM) and ARTROL, which is the WHO’s regional office database for Africa. The databases will be searched from inception until 19 July 2015. Appraisal of study quality will be performed after results synthesis. Data synthesis will be performed independently for quantitative and qualitative data using a mixed methods sequential explanatory synthesis for systematic mixed studies reviews. Meta-analysis will be conducted for the quantitative studies, and thematic synthesis for qualitative studies and qualitative results from the non-controlled observational studies. The primary outcome will include exercise adherence and physical activity behaviour changes. This review protocol is reported according to Preferred Reporting Items for Systematic reviews and Meta-Analysis protocols (PRISMA-P) 2015 guidelines.

Ethics and dissemination: There is no ethical requirement for this study, as it utilises published data. This review is expected to inform the development of exercise and physical activity-related behaviour-change interventions in Africa, and will be presented at conferences, and published in peer reviewed journals and a PhD thesis at King’s College London.

Protocol registration number: This study was registered with the International Prospective Register of Systematic Reviews (PROSPERO) on 22 January 2015 (registration number: PROSPERO 2015: CRD4215916004).

INTRODUCTION

Rationale

Eighty per cent of worldwide deaths from chronic non-communicable diseases (NCDs) occur in low and middle-income countries, of which 80% occurred in only 23 countries. Nigeria, South Africa, Egypt, Congo and Ethiopia were the African countries among these. The main chronic NCDs in African countries include cardiovascular diseases, diabetes, cancer and chronic respiratory disease.1 Bone and joint disorders also contribute significantly to the burdens of chronic conditions in the region.2 There have been reports of an interrelation between common NCDs and bone and joint disorders.4 For instance, according to the Centres for Disease Control and Prevention,5 obesity is a common risk factor for the aforementioned chronic conditions. Furthermore, obesity and chronic pain are believed to have a multifactorial link with no single identifiable causative relationship between the two.4 Obesity and chronic pain may arise due to genetic,
“A life of living death”: the experiences of people living with chronic low back pain in rural Nigeria

Chinonso N. Igwesi-Chidobe, Sheila Kitchen, Isaac O. Sorinola & Emma L. Godfrey

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