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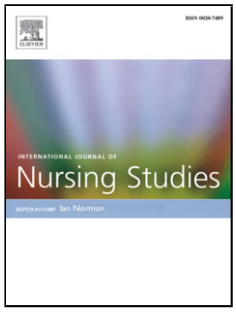

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Author: Agurtzane Mujika Angus Forbes Navidad Canga Jokin de Irala Inmaculada Serrano Plácido Gascó Margaret Edwards

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TITLE PAGE

Title

Motivational interviewing as a smoking cessation strategy with nurses: an exploratory randomised controlled trial

Authors

Agurtzane Mujika

School of Nursing, University of Navarra

Angus Forbes

Florence Nightingale School of Nursing and Midwifery. King's College London

Navidad Canga

School of Nursing, University of Navarra

Jokin de Irala

School of Medicine, University of Navarra

Inmaculada Serrano

School of Nursing, University of Navarra

Plácido Gascó

Iturrama Primary Care Centre. Servicio Navarro de Salud

Margaret Edwards

Florence Nightingale School of Nursing and Midwifery. King's College London

Corresponding author:

Dr. Agurtzane Mujika (amujika@unav.es)

c/ Irunlarrea 1

31008 Pamplona

0034 948 425600, Ext. 6631

Fax 0034 948 425740

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Motivational interviewing as a smoking cessation strategy with nurses: an exploratory randomised controlled trial

Abstract

Background: Despite the important role that health professionals have in reducing tobacco use, many have a smoking habit themselves. The prevalence of smoking is particularly high among nurses.

Objective: To test the efficacy, acceptability and feasibility of a motivational interviewing (MI) based smoking cessation intervention with nurses.

Design: two group parallel experimental design with random allocation to groups.

Setting: a large teaching hospital in the North of Spain.

Participants: Nurses who smoked (n=30) were randomised into two groups: motivational interviewing based intervention (n=15) and usual care (n=15).

Methods: Motivational interviewing based intervention consisted of four individual MI sessions. Usual care consisted of brief advice. Variables considered to assess efficacy were biochemically verified smoking cessation, mean cigarettes smoked, stages of change, self-efficacy and depression score. Variables to assess acceptability and feasibility included participant satisfaction, adherence to MI, and duration of sessions. Data were collected at: baseline, end of intervention and three months after the end of the intervention.

Results: At three month follow up, compared with the control group, more nurses in the intervention group had quit (absolute difference 33.3%; 95% confidence interval [CI] 2.6 to 58.2). In the nurses who did not quit, there was no significant difference between the intervention and control groups in the number of cigarettes smoked per day, although progress in the stages of change was greater in the intervention group compared to the control group. Measures of acceptability and feasibility indicated good satisfaction with the intervention, with high levels of attendance and completion.

Conclusion: This study found a beneficial effect of motivational interviewing on nurses' smoking cessation. The intervention was acceptable for nurses and a number of aspects were identified that

need to be considered prior to conducting a larger scale in order to optimise the intervention. Using MI might be a novel approach to the problem of health professionals who smoke.

Keywords

Ambivalence; cognitive dissonance; motivational interviewing; nurses; professional role; randomised controlled trial; smoking cessation.

Introduction

Smoking is the leading preventable cause of mortality and morbidity and health professionals are expected to contribute to tackle this problem. However, many health professionals smoke themselves. In many European countries such as Greece, Italy, Portugal, France and Poland the prevalence of health care providers who smoke exceeds that of the general population (La Torre, 2013). In Spain and Italy the number of smoking nurses approaches half of the nursing population, 44% and 49.8% being smokers respectively (Santamaría et al., 2005; Ficarra et al., 2011). This has serious implications, in terms of their own health and in terms of the care they provide to their patients. The health promoting role is a core element of the practice of nursing (McCann, Clark, & Rowe, 2005). It has been reported that nurses who smoke: rate their health education role as being lower compared to non-smoking or ex-smoking nurses (McKenna et al., 2001), show poorer smoking-related knowledge (Booth & Faulkner 1986), are less likely to instruct patients about quitting, and are less effective at providing support (McCarty et al., 2001). Furthermore, the smoking behaviour of the professionals themselves has been found to be the most significant variable affecting their health education role (McCann et al., 2005).

It has also been noted that health professionals who have quit are particularly effective at convincing patients to do the same (Willaing & Ladelund, 2004). The World Health Organization (WHO) also has emphasized the need to help health professionals quit (WHO, 2005). Despite the centrality of the topic, efforts directed at reducing health professionals' smoking prevalence rates are limited. Smoking cessation studies conducted with nurses are scarce, show variable results and are methodologically limited (Brown & Kiss, 1987; Gritz et al., 1988; Rowe & Macleod Clark, 1999; Chalmers et al., 2001). There are a number of approaches which have shown to be effective in helping smokers quit, such as individual counselling (Lancaster & Stead, 2005) and group behaviour therapy (Stead & Lancaster, 2005). However, the smoking behaviour among nurses, and health professionals more generally, may have certain peculiarities given their professional role. There are reports of negative feelings among nurses about their smoking behaviour (González et al., 2009) and internal conflicts with the ambivalence that they experience around this behaviour (Radsma & Bottorf, 2009). Hence, it would seem that the cognitive dissonance experienced by nurses who smoke, in relation to the conflict

between their knowledge of smoking disease, their role as health promoters and the needs they have that perpetuate their habit, might be important in helping them quit smoking.

Motivational interviewing (MI) is a specific psychological intervention that in part uses cognitive dissonance to promote behaviour change. There is evidence to show that MI can be an effective aid to help smokers quit (Lai et al., 2010) but to our knowledge there are no previous reports on the use of this strategy with health professionals. The aim of this study was to test the efficacy, acceptability and feasibility of a smoking cessation intervention based on MI in nurses.

Methods

The study was designed following the Medical Research Council's (MRC) framework for complex interventions and presented in this paper is the exploratory trial stage (Campbell et al., 2007). The study followed a two group parallel experimental design. Eligibility was based on nurses who smoked and accepted to participate. The study was designed as a preliminary trial to help estimate the treatment effect testing the hypothesis that a behavioural model of smoking cessation intervention based on motivational interviewing would have more impact on smoking cessation than brief advice.

Sample recruitment

The study was conducted at Clinica Universidad de Navarra (CUN) in Pamplona (Navarra), a large teaching hospital in the North of Spain. The study was advertised to smoking nurses who worked at the hospital, irrespective of whether they were thinking about quitting or not. Given the aim of this stage of the framework conventional sample size calculation was not appropriate (Lovell et al., 2008). It was deemed that 30 participants would be sufficient to obtain an estimate of the intervention's effect size, in line with studies of similar characteristics (Higginson et al., 2006; Turner et al., 2007; Lovell et al., 2008).

Randomisation

Nurses were randomly allocated to the control or intervention condition, using a computer-generated random allocation method (see Figure 1). A person other than the researcher administering the treatment and the person analysing the data, generated a random sequence of 30 conditions (15 intervention and 15 control) and prepared the sealed opaque sequentially numbered envelopes with the

corresponding condition inside. After nurses' consent, the therapists opened the corresponding envelope to determine the group assigned. Participants were not told the group to which they had been assigned.

Treatment conditions

There were two treatment conditions. Nurses in the experimental group received the intervention following the intervention protocol (see Figure 1).

The intervention protocol encompassed three main components: a motivational interviewing context, a toolkit, and relapse prevention. Following the first component, the intervention sessions were embedded in a motivational interview context and followed two subsequent phases: the exploratory phase and resolutive phase (Miller & Rollnick, 2002). The former aimed to explore the potential ambivalence that nurses may experience regarding their smoking and construct motivation for change through "change talk" by developing a therapeutic alliance between the therapist and the nurse. Once the decision to change behaviour was made, the resolutive phase focused on reinforcing the decision to change and developing a change plan. As part of the toolkit, the second component of the intervention protocol, participants were also given a choice over a range of tools. Although the decision to use either tool relied on the nurses, some of the tools were deemed to be more helpful in exploratory phase and others in the resolutive phase. Among the former, there were the decisional balance sheet and the cigarette consumption register. Among the latter, problem solving skills, social support resources and pharmacological support. The third component was directed at maintenance strategies in an attempt to give response to the frequent phenomenon of relapse preventatively.

The three components of the intervention were delivered by one single therapist through four one-to-one therapy sessions on an approximately weekly basis. This decision was based on the need to establish a relationship where the participants would feel comfortable enough to share their experiences, feelings and thoughts, as well as ensuring confidentiality of the information revealed. The objectives of these sessions were to support and guide the participant to: establish a desire to quit and a quitting date, maintain abstinence, overcome withdrawal symptoms and adopt a new lifestyle without tobacco. The spirit of MI emphasizes the importance of autonomy and patient's collaboration, which meant that the sessions had to be person centred and flexible. Therefore, while the aim was to

progress, the therapy stayed with the nurses in terms of where they were in relation to their readiness for change.

Nurses in the control group received brief anti-smoking advice. This advice was given following current practice based on the 5As. The 5As refer to: (1) ask patients about quitting smoking at every visit, (2) advise all tobacco users to quit, (3) assess smokers' willingness to try to quit, (4) assist smokers' efforts with treatment and referrals, and (5) arrange follow-up contacts to support smoking cessation efforts (Fiore et al., 2008). Nurses were reminded about the convenience of quitting smoking and the benefits of doing so.

Participants in both groups were able to use pharmacotherapy although its provision was not standardised in either group.

Data collection and instruments

The primary efficacy outcome in the study was biochemically verified smoking cessation. Secondary outcomes included: mean cigarettes smoked, stages of change, self-efficacy and depression score. Other outcomes included participant satisfaction, and adherence to MI and duration of sessions, in relation to acceptability and feasibility respectively.

Data were collected by means of questionnaires which included sociodemographics, standardised instruments and a number of questions that aimed to assess the smoking history and characteristics, participants' experience of participation and their assessment of the intervention. Data collection was undertaken at three time points: baseline (T1), end of intervention (T2) and three months after the end of the intervention (T3).

The specific instruments are presented in three sections in response to the three components of efficacy, acceptability, and feasibility.

EFFICACY

Urine cotinine

Urine cotinine was selected as marker for its sensitivity (97%) and specificity (99%) (Jarvis et al., 1987; Velicer et al., 1992). Its mean biological life is of about 15-40 hours and its elimination from the body occurs mainly through urine. The maximum cotinine concentration in the urine appears about two hours after smoking the cigarette and its clearance is slow, being still detectable after 36 hours

(Pérez Trullén et al., 2006). Nurses who self-reported being abstinent for at least one week were asked to collect a 10ml urine sample. These were sent to a certified laboratory for their analysis by enzimoinmunoanalysis, with a cut off point of 500ng/mL.

Expired Carbon Monoxide (CO) levels as measured with a portable Micro^{+} Smokerlyzer (Bedfont Instruments; Kent, UK). CO levels of ≥8 parts per million (ppm) suggest recent smoking (SRNT Subcommittee on Biochemical Verification, 2002).

The Fagerström Test for Nicotine Dependence (FTND), is a widely used measure of nicotine dependence with a validated Spanish translation (Becoña & Vázquez, 1998). This measure includes six questions, with each answer having a score. The sum of the six scores yields an overall score, higher scores suggesting greater nicotine dependence.

Prochaska's Stages of Change (Prochaska & Velicer, 1997) assesses desire and readiness to quit smoking. Nurses' stage of change was determined using two questions: 'Did you quit smoking?', which had two possible answers 'yes' or 'no'. Nurses who reported affirmatively were asked to state the date. For nurses reporting 'no' there was a second question asking 'Are you currently thinking about quitting?' The three possible responses were: 'yes, in the next 30 days' 'yes, in the next 6 months', 'no, not really'. According to their responses nurses were classified into: precontemplation, contemplation, preparation, action, or maintenance.

The General Self-Efficacy (GSE) to measure respondent's self-efficacy through 10 items. Total scores range from 10 to 40, higher scores indicating higher self-efficacy (Scholz et al., 2002).

The Patient Health Questionnaire (PHQ-9) is a 9-item tool designed for primary care providers to use in the diagnosis of depression that has been validated as a depression screening tool (Kroenke, et al., 2001). Scores range 0 to 27, participants falling into one of these categories: 0-4 (symptoms of depression not present), 5-9 (minimal depression), 10-14 (moderate depression), 15-19 (moderately severe symptoms of depression), and 20 or greater (severe symptoms of depression).

ACCEPTABILITY

The Client Satisfaction Questionnaire (CSQ-8) is an 8-item tool that yields a single overall measure of satisfaction, from 0 to 32, higher scores indicating more satisfaction with treatment (Roberts et al., 1984).

In addition to this, a number of open ended questions were also included in the questionnaire in order to obtain a more complete view of their satisfaction. Specifically, these questions asked them to highlight 3 positive or helpful aspects of the intervention and 3 negative aspects. They were also asked to identify anything they would change, and if so what, about the intervention.

FEASIBILITY

Motivational Interviewing Treatment Integrity (MITI) Code (Moyers et al., 2005). The MITI measures levels of MI competence and the relationship between interpersonal skills and client collaboration. It was used to assess the fidelity of the intervention and its adherence to MI principles.

In addition, the therapist maintained a diary during the course of the study. The diary detailed: dates and duration of sessions, issues that arose during the sessions or within the conduct of the study, and researcher's reflections.

Data analysis

The main outcome measure calculated was cessation incidence based on biochemical validation. The incidence difference (with the respective 95% CI) was calculated. Data were reported as mean (SD) or median (IQR) as appropriate for continuous variables. Categorical variables were reported as percentages (n). Differences between proportions were evaluated using chi square or Fisher's exact test, as appropriate. Mann Whitney U test and T test were used for comparing continuous variables as appropriate. SPSS 15.0 software (SPSS Inc. Texas, USA) was used to carry out the analyses. All p-values reported were two-tailed. Statistical significance was set at $p < 0.05$.

The open ended questions were analysed using content analysis. The text coming from participants' responses was coded, or broken down, into manageable categories. Then, presence, meanings and relationships of words and concepts related to satisfaction and acceptability of the intervention were quantified and analysed.

Ethical considerations

This study was in compliance with the Helsinki Declaration and local legislation. Ethical approval was sought and granted by the Ethics Committee of the Hospital. Informed consent was sought from the nurses participating in the trial. All data were treated confidentially and kept safely. Archives

containing information on the intervention were separated from the archive with participants' personal information.

Results

The sample was formed of 30 female nurses. Characteristics of participants in both groups are detailed in Table 1. These were similar except for three variables directly associated with smoking: number of cigarettes smoked, carbon monoxide scores and nicotine dependence. According to the data, nurses felt they had good self-efficacy and did not show symptoms of depression.

Efficacy

At the first time interval (Time 1 to Time 2) one nurse had quit in each group (6.7%). By Time 3, 6 nurses in the intervention group had quit (including the nurse who had quit in Time 2), while in the control group only one nurse had quit (the same nurse as in Time 2) (see Table 2). The absolute difference in percentage of quitting between groups was 33.3% (95% CI 2.6 to 58.2) (data not shown). All cessation self-reports were biochemically verified.

In terms of the number of cigarettes smoked, overall, there was a mean difference of - 1.9 (95% CI - 5.0 to 1.1) between groups (data not shown). When exploring the cigarette consumption by time intervals in both groups, within the first time interval (from T1 to T2) intervention participants reduced their consumption almost by half whereas control participants remained stable. However, within the second time interval (from T2 to T3) there was an increase in the mean of number of cigarettes smoked in the intervention group participants while among controls it remained rather stable (see Table 2). This suggested that the trend observed in the two groups was different. When analysing this trend in more detail, after classifying the participants into three groups according to their cigarette consumption level at baseline (light smokers 1-9 cigarettes per day; moderate smokers 10-19 cigarettes per day; and severe smokers 20 or more cigarettes per day) it was found no difference in cessation incidence between them. However, when comparing the cessation incidence among participants who at baseline smoked less than 20 cigarettes per day and those who smoked 20 cigarettes per day or more, 29.2% of the former versus none of the latter had quit at Time 3. This suggests that those who were severe smokers were less likely to quit.

Participants who had not quit showed some progress across the stages towards action in the intervention group, whereas in the control group the data may suggest a very slight trend (see Table 2). Participants in the latter, in case of progressing, were likely to progress from precontemplation to contemplation rather than towards more action-oriented stages. At baseline (Time 1), 73% of intervention participants were in precontemplation or contemplation stages (n=5 and n=6, respectively), whereas 93% of the controls (n=9 and n=5, respectively) were in the same stages. In Time 3, the percentage of intervention nurses who were in the precontemplative stage had decreased to 39% (n=1 and n=5, respectively) while among control nurses it remained stable at 93% (n=7 in each of the two stages).

Participants' self-efficacy remained stable in general terms, although a slight decrease was observed in the control group across time (see Table 2). These differing trends resulted in statistically significant differences between groups at Time 3 (see Table 2). Overall, the mean difference for the change between groups was 1.1 (95% CI -1.7 to 3.8) (data not shown).

The depression scores showed opposing trends by group. In the control participants a trend toward higher depressive symptoms was observed whereas among the intervention participants depression scores improved. The difference observed between groups at Time 3 reached statistical significance (see Table 2). The overall mean difference in depression score between groups was -1.7 (95% CI -3.9 to 0.4) (data not shown).

Acceptability

The assessment of acceptability had two elements. The standardised instrument used, the CSQ-8, showed that mean satisfaction score was 20.1 (SD=2.3), which suggests that in general terms they were satisfied with the programme. The second element were the answers to the open ended questions, which were content analysed. Control group participants showed a neutral attitude towards the experience of participating, while nurses in the intervention group perceived it as a positive experience that made them believe they were capable of achieving their goal. More than half of the nurses in the intervention group highlighted having the opportunity to talk openly about a problem with a recipient that listened, without being told off, and making them think in other terms different from the usual

threatening messages. One nurse reported some degree of boredom in talking about the same issues all the time.

Feasibility

Issues such as recruitment, intervention delivery, compliance and retention were explored considering the reflections that had been registered in the researcher's diary. Intervention delivery was ongoing as new participants were recruited. This enabled that nurses willing to participate would not have to wait after they enrolled until the date was set. In terms of delivery, accomplishing the dates set was challenging at times. Most nurses showed their preference in having the sessions during their shifts, which meant that in most cases the ultimate occurrence or not of the session was dependent on a telephone call from the researcher to ascertain whether the conditions (state of the ward, patients and workload) at that time permitted having the session or not. If this was not the case, another day was set that the nurse foresaw that the meeting could happen. This impeded holding weekly sessions in some instances, and the sessions had to be expanded in time. A second consequence was that when the sessions could actually be held, the limitation, or even lack, of time and the venue or physical environment made the conditions the nurse was in within the session not optimal, as they were distracted from the session and compromised the creation of an adequate atmosphere for the therapy.

Time spent in the sessions varied from 13 to 72 minutes per session. Most intervention nurses completed the four sessions with the exception of the nurses who only had three sessions (see Figure 1). Data collection at the three month follow-up was completed for the whole sample.

Other relevant considerations: fidelity of the intervention

All sessions were monitored to record frequency and duration, as well as tape recorded so that the transcripts were used to assess the fidelity of the threrapy by using the MITI Coding Form. Transcripts pertaining to three nurses in the intervention group were randomly selected for their evaluation. A random segment of 20 minutes was selected from each transcript following the instructions of the MITI. All summary scores and global assessment scores were evaluated against established benchmarks for MI quality (Moyers et al., 2005). The scores suggested that the therapist showed good fidelity to motivational interviewing method.

Discussion

The findings of this study suggest that an MI intervention for nurses could significantly reduce smoking in this population. The cessation rate observed in this study was greater than in previously reported interventions, the strongest of which was Lai et al.'s study which demonstrated a 25% quiting rate at 12 months (Lai et al., 2010), although the follow-up in the present study is only to 3 months. Findings indicate that the benefit from the intervention was not limited to cessation, as nurses who did not quit also progressed to more action-oriented stages. The use of the stages of change in smoking cessation has been questioned in response to the conclusions drawn from a systematic review that suggested that the evidence on the effectiveness of stage-based interventions in changing smoking behaviour was not conclusive (Riemsma et al., 2003). However, it was also noted that more rigorous studies tended to show more positive outcomes. While progression in stages of change may not necessarily correspond with behaviour change as has been suggested, it is relevant to this study as it shows that the flow of therapy was having an impact. There is one additional reason that contributed to the rationale for the inclusion of stages of change in this study. The concept of ambivalence, key in this study, has been linked to the one of readiness to change in a clinically useful way. The ambivalence conflict is experienced in its most heightened form as someone moves from the contemplation to the preparation stage (Rollnick et al., 1993), and therefore, progress will depend on helping the patient to resolve this ambivalence.

Cigarette consumption and nicotine dependence at baseline were rather low in the sample. As Hettema & Hendricks (2010) pointed out, MI may show particular promise for individuals with low tobacco dependence and motivation to quit. In tandem with these positive results in smoking outcomes, nurses who successfully quit also showed a noticeable improvement in the their depression scores. This would be in accordance with previous literature indicating that negative affect and depression could act as negative mediators in quit attempts (Kendler et al., 1993). It may also suggest that their achievement contributed to reducing their negative affect.

Nurses' satisfaction levels with their participation were high and a number of issues were also identified that future investigations should consider. Nurses valued very positively having the chance to talk about their habit with someone who listened in a manner that made them revisit their choices

and habits. There was a suggestion that pharmacologic treatment should be included as an aid. In this study, pharmacologic help was not standardised in the protocol or actively offered to participants. However, it was not prohibited or excluded either. For future studies, if the principles of MI are to be respected, this issue should remain as it is, since any prescription by the researcher could seriously compromise the philosophy underlying MI. Another suggestion was adding some more sessions. In the study, in some cases, by the time nurses made the decision of making a quit attempt the intervention was approaching its end, and they felt having that support throughout the quitting process might be of help. In contrast, one nurse believed the sessions were somewhat repetitive. This would be in accordance with Lai et al. (2010), who did not find evidence to support that greater length of therapy led to improved outcomes. Clearly, these opposing views indicate that any help offered in this sense in the future should be individualised according to the needs of each one, which is how MI is intended to work. In terms of feasibility, delivering motivational interviewing was time consuming, both for participants and therapist, and therefore allocation of sufficient resources should be considered for future studies.

A number of potential limitations also need to be acknowledged, most of which might be related to the small scale character of the trial. Sample size might have been too small to study the effectiveness of the intervention. The differences in smoking related variables between groups identified at baseline despite random allocation might have been a consequence of the small sample size. However, the level of cessation observed and the decline in cigarette consumption suggest that further exploration of this approach is worthwhile. Another limitation of this study was the follow-up period. Best practice guidelines for smoking cessation interventions recommend that length of follow up should be at least 6 months (West et al., 2005). However, the follow-up in this study did extend beyond the period where the greatest proportion of relapses occur (Brandon et al., 1990), as it has even been found that most relapses occur within the first 8 days (Hughes et al., 2004) and extending the follow-up until six months enables detecting up to only 17% more cases of relapse (Brandon et al., 1990).

This study had a number of methodological strengths, in particular that self-reports of abstinence were biochemically verified by urine cotinine measurements, which is considered a ‘best practice’ indicator in smoking cessation trials (West et al., 2005), confirming a deceit rate of zero. Intention to treat

analyses was applied, even though participants' follow up in this study was complete. The integrity of the intervention delivered was assessed.

As suggested by the MRC framework the exploratory trial stage is a crucial stage prior to the main RCT as it enables exploring the impact of the intervention as well as identifying potential difficulties so that the necessary changes can be incorporated to optimize the results of the main trial. Therefore, the findings of this study have shown that MI based smoking cessation intervention is a potentially effective means of reducing smoking levels in the nursing population. This exploratory trial provides a useful platform to inform a more definitive trial following the MRC framework for complex interventions. Developing interventions to support smoking cessation in nurses is a priority both for the health of the nurses themselves and in enhancing their potential as health promoters and advocates for smoking cessation in the wider population.

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What this paper adds

What is already known about the topic?

- There is a need to help nurses who smoke to abandon this habit
- The smoking behaviour of this population, as health professionals, has peculiarities that may require different approaches
- Cognitive dissonance is particularly central to this population's smoking behaviour
- Motivational interviewing is a strategy that can be used in dealing with cognitive dissonance

What this paper adds

- A motivational interviewing smoking cessation intervention with nurses showed a strong beneficial effect and was acceptable to them.
- This appears to be the first study using this strategy with nurses, a population among which this strategy could be especially effective.
- These promising results should be tested in a powered randomized controlled trial, after consideration of the aspects identified in the present trial.
- If future results supported these claims, the applicability of this approach might be extended to other subgroups such as physicians, among whom the issue of ambivalence may pressumably be of relevance too.

Table 1. Comparison of baseline characteristics between intervention and control group Means (SD)

	Intervention (n=15)	**Control** (n=15)	***P*-value**
Age	40.9 (8.9)	39.4 (10.0)	0.66 †
Age started	16.9 (1.9)	18.0 (3.0)	0.25 †
Has previously attempted to quit*	10 (66.7%)	10 (66.7%)	0.65 ‡
Cig/day	12.3 (5.6)	7.7 (4.9)	0.04 †
Stage of change*			
Precontemplation	5 (33.3%)	9 (60.0%)	
Contemplation	6 (40.0%)	5 (33.3%)	0.22 ‡
Preparation	4 (26.7%)	1 (6.7%)	
Fagerstrom	3.6 (1.9)	1.4 (2.1)	0.003 †
CO	11.3 (7.2)	6.9 (4.6)	0.034 †
Live with smoker*	5 (33.3%)	5 (33.3%)	0.65 ‡
Parents smoked*			
None of them	4 (26.7%)	6 (40.0%)	
Both of them	4 (26.7%)	4 (26.7%)	0.68 ‡
Only mother	6 (40.0%)	5 (33.3%)	
Only father	1 (6.7%)	0	
Hours worked*			
Full time	12 (80.0%)	10 (66.7%)	0.43 ‡
Part time	3 (20.0%)	5 (33.3%)	
Work nightshifts*	9 (60.0%)	5 (33.3%)	0.14 ‡
Nº of children*			
None	6 (40.0%)	6 (40.0%)	
One	2 (13.3%)	1 (6.7%)	0.62 ‡
Two	5 (33.3%)	3 (20.0%)	
Three	1 (6.7%)	4 (26.7%)	
More than three	1 (6.7%)	1 (6.7%)	
Help with housework*			
Yes, husband/partner	8 (53.3%)	4 (26.7%)	0.27 ‡
Yes, other	6 (40.0%)	8 (53.3%)	
No	1 (6.7%)	3 (20.0%)	
Self-efficacy	31.8 (3.3)	30.2 (5.3)	0.32 †
Depression	3.5 (2.8)	3.6 (4.4)	0.92 †

* Nº of participants (%)

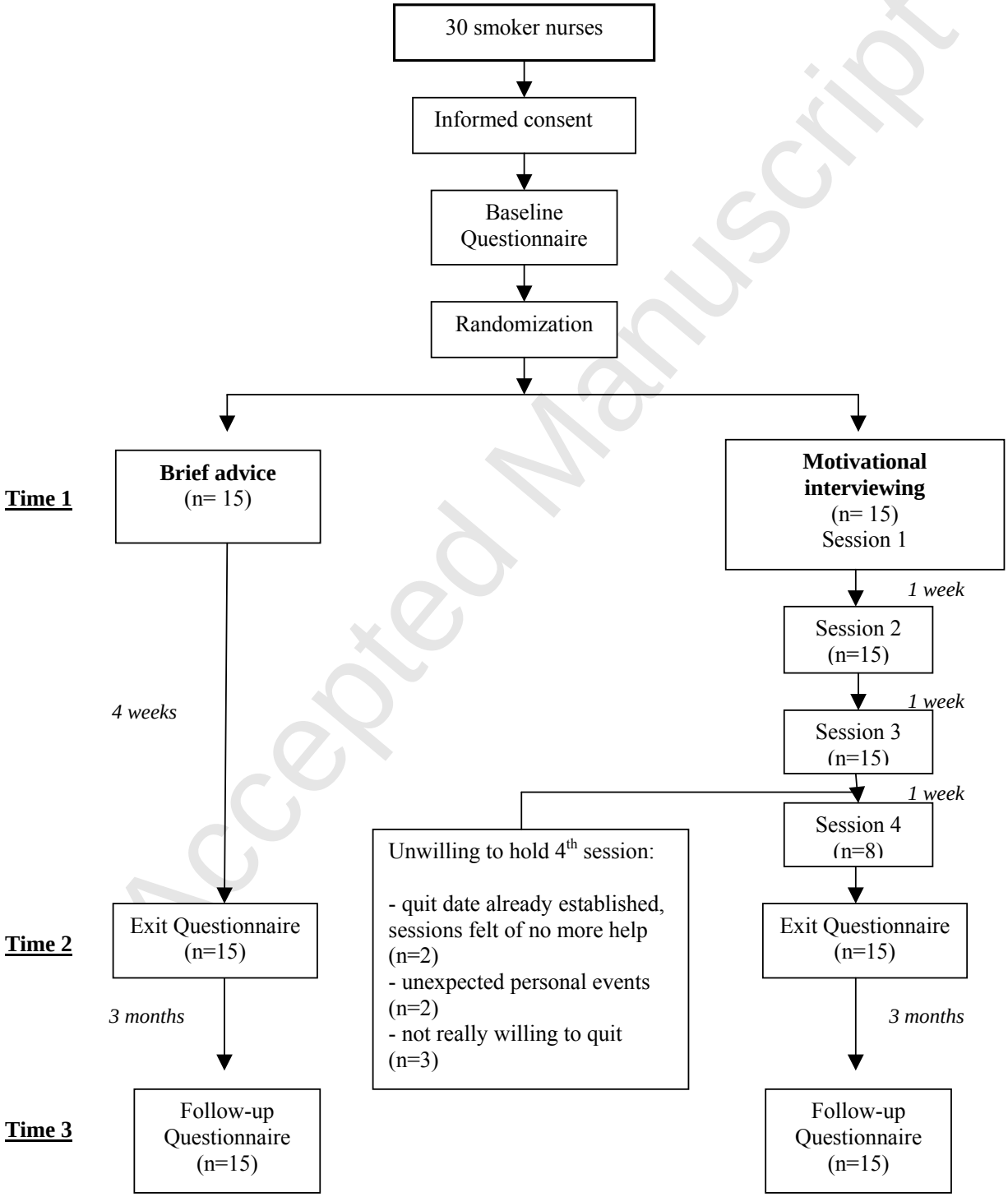
† P value for Mann Whitney U test; ‡ P value for X^2 test

Table 2. Comparison of cigarette consumption, Stage of Change, Self-efficacy and Depression scores between intervention and control group at three timepoints

	Baseline (T1)			Exit (T2)			Follow up (T3)		
	Intervention	**Control**	***P*-value**	**Intervention**	**Control**	***P*-value**	**Intervention**	**Control**	***P*-value**
Nº quit smoking*	(n=15)	(n=15)		(n=15)	(n=15)		(n=15)	(n=15)	
	N/A	N/A	N/A	1 (6.7)	1 (6.7)	N/A	6 (40.0)	1 (6.7)	0.04 †
Mean cig/day	(n=15)	(n=15)		(n=14)	(n=14)		(n=9)	(n=14)	
	12.3 (5.6)	7.7 (4.9)	0.04 †	7.7 (4.4)	7.1 (5.1)	0.63 †	10.8 (5.0)	6.2 (5.2)	0.03 †
Stage of change* (Prochaska)	(n=15)	(n=15)		(n=15)	(n=15)		(n=15)	(n=15)	
	5 (33.3)	9 (60.0)		3 (20.0)	8 (53.3)		1 (6.7)	7 (46.6)	
Precontemplation	6 (40.0)	5 (33.3)	0.24	4 (26.7)	6 (40.0)	0.01	5 (33.3)	7 (46.6)	0.01
Contemplation	4 (26.7)	1 (6.7)	†	7 (46.6)	0	†	3 (20.0)	0	†
Preparation	0	0		1 (6.7)	1 (6.7)		6 (40.0)	1 (6.7)	
Action									
Self-efficacy (GSE)	(n=15)	(n=15)		(n=15)	(n=15)		(n=15)	(n=15)	
	31.8 (3.3)	30.2 (5.3)	0.28 ‡	31.8 (3.3)	29.8 (5.1)	0.14 ‡	31.7 (3.1)	29.0 (4.3)	0.04 ‡
Depression (PHQ-9)	(n=15)	(n=15)		(n=15)	(n=15)		(n=15)	(n=15)	
	3.5 (2.8)	3.6 (4.4)	0.65 ‡	3.8 (4.3)	3.9 (4.2)	0.74 ‡	2.2 (2.9)	4.1 (2.9)	0.02 ‡

* n (%)
† P value for Fisher's exact test; ‡ P value for Mann Whitney U test

Figure 1. Flow-chart of intervention groups



Highlights

What is already known about the topic?

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