



King's Research Portal

DOI:

[10.1016/j.jclinepi.2023.05.005](https://doi.org/10.1016/j.jclinepi.2023.05.005)

Document Version

Peer reviewed version

[Link to publication record in King's Research Portal](#)

Citation for published version (APA):

Zhao, J., Liu, J., Tyrovolas, S., & Mutz, J. (2023). Lack of consensus regarding the concept of psychological frailty in older adults: A systematic scoping review. *Journal of Clinical Epidemiology*, 159, 300-308.
<https://doi.org/10.1016/j.jclinepi.2023.05.005>

Citing this paper

Please note that where the full-text provided on King's Research Portal is the Author Accepted Manuscript or Post-Print version this may differ from the final Published version. If citing, it is advised that you check and use the publisher's definitive version for pagination, volume/issue, and date of publication details. And where the final published version is provided on the Research Portal, if citing you are again advised to check the publisher's website for any subsequent corrections.

General rights

Copyright and moral rights for the publications made accessible in the Research Portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognize and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the Research Portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the Research Portal

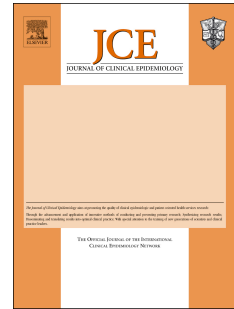
Take down policy

If you believe that this document breaches copyright please contact librarypure@kcl.ac.uk providing details, and we will remove access to the work immediately and investigate your claim.

Journal Pre-proof

Lack of consensus regarding the concept of psychological frailty in older adults: A systematic scoping review

Jinlong Zhao, MSc, Justina Liu, PhD, Stefanos Tyrovolas, PhD, Julian Mutz, PhD



PII: S0895-4356(23)00111-7

DOI: <https://doi.org/10.1016/j.jclinepi.2023.05.005>

Reference: JCE 11080

To appear in: *Journal of Clinical Epidemiology*

Received Date: 1 December 2022

Revised Date: 18 March 2023

Accepted Date: 1 May 2023

Please cite this article as: Zhao J, Liu J, Tyrovolas S, Mutz J, Lack of consensus regarding the concept of psychological frailty in older adults: A systematic scoping review, *Journal of Clinical Epidemiology* (2023), doi: <https://doi.org/10.1016/j.jclinepi.2023.05.005>.

This is a PDF file of an article that has undergone enhancements after acceptance, such as the addition of a cover page and metadata, and formatting for readability, but it is not yet the definitive version of record. This version will undergo additional copyediting, typesetting and review before it is published in its final form, but we are providing this version to give early visibility of the article. Please note that, during the production process, errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

© 2023 Published by Elsevier Inc.

Lack of consensus regarding the concept of psychological frailty in older adults: A systematic scoping review

Jinlong Zhao^a MSc, Justina Liu^{a*} PhD, Stefanos Tyrovolas^a PhD, and Julian Mutz^b PhD

^a School of Nursing, Faculty of Health and Social Sciences, The Hong Kong Polytechnic University, Hong Kong, China

^b Social, Genetic and Developmental Psychiatry Centre, Institute of Psychiatry, Psychology and Neuroscience, King's College London, London, United Kingdom

*Corresponding author

School of Nursing, Faculty of Health and Social Sciences, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong

Email: justina.liu@polyu.edu.hk.

Tel.: +852 2766 4097

Abstract

Objectives: We reviewed the existing definitions of psychological frailty and provided a comprehensive overview of the concept and associated measurements.

Study Design and Setting: We followed the PRISMA guidelines for scoping reviews and the Joanna Briggs Institute Manual for Evidence Synthesis. The eligibility criteria when including the studies were developed based on the participants-concept-context framework. We searched the Cumulative Index to Nursing and Allied Health Literature, Scopus, PubMed, Web of Science, PsycINFO databases, and other sources for relevant studies published between January 2003 and March 2022.

Results: The final scoping review included 58 studies. Of these, 40 defined psychological frailty, 7 provided a novel definition, and 11 focused on the components defining psychological frailty. We proposed four groups of components to better characterize psychological frailty: mood, cognitive, other mental health, and fatigue-related problems. We identified 28 measuring tools across studies, and the Tilburg Frailty Indicator was the most frequently used (46.6%).

Conclusion: Psychological frailty is a complex concept whose definition lacks consensus. It should include both psychological and physical features. Depression and anxiety are commonly used to define it. This scoping review outlined future research directions for refining the concept of psychological frailty.

Keywords: psychological frailty; depression; frailty; older adult; Tilburg Frailty Indicator

Running title: Psychological frailty in older adults

1. Introduction

Frailty is a clinical syndrome characterized by age-related changes across multiple bodily systems, weakened physiological functions, and heightened susceptibility to diverse stressors [1]. *Physical frailty* emphasizes age-related physiological changes in the human body. These physiological dysfunctions may contribute to a progressive decline in cognitive functioning (cognitive frailty). Physical and cognitive frailty have been extensively studied in older adults. However, these do not incorporate the *psychological frailty* domain. Like physical and cognitive frailty, psychological frailty results from age-related decline in physiological and psychological reserves, contributing to high vulnerability to stressors and increased morbidity risks [27,61]. Frailty as a pre-disability or pre-disease health state necessitates a comprehensive evaluation framework because *health* is a continuous state of physical, psychological, and social well-being [2]. Therefore, multiple domains, including psychological, should be integrated into the frailty model.

The literature has recognized and highlighted the importance of comprehensively measuring frailty, including its psychological dimensions. Further studies on frailty incorporating psychological and other domains are required to increase the sensitivity of measures for detecting health issues in older adults [3]. A comprehensive assessment of frailty may predict adverse health outcomes well and help identify potential targets for therapeutic interventions [4]. Frailty measures have been criticized for excluding the psychological domain as they may overlook psychological issues [5,6]. Most definitions and measurement tools emphasize physical frailty while omitting psychological features. Therefore, psychological frailty has been proposed as a comprehensive paradigm of frailty [5].

Limited studies have examined the definitions or components of psychological frailty [7,8]. However, there are considerable inconsistencies in its conceptualization and no consensus regarding its assessment. Although it has been assessed using diverse measures (e.g., frailty assessments and mental health scales), a validated measure is lacking. A possible reason is the absence of a commonly recognized definition of psychological frailty.

Currently, most frailty assessments, mainly frailty indices, are based on Mitnitski et

al.'s [9] cumulative deficit approach. This approach was constructed without relevant items that clearly indicate psychological frailty. Few existing frailty assessments include psychological dimensions (e.g., the Tilburg Frailty Indicator [TFI] and Groningen Frailty Indicator [GFI]). Furthermore, some studies have used mental health components, such as depression, to identify psychological and other domains in frailty indices [10,15,17]. Incorporating psychological features under the cumulative deficit approach of frailty can facilitate a meticulous evaluation of the factors potentially causing frailty in older adults. Moreover, psychological frailty is strongly associated with other frailty domains, such as the physical and cognitive domains [11]. A refined definition of psychological frailty could enhance the understanding of the relationships between domains of frailty and unravel their relation with adverse health outcomes (e.g., mental disorders). This would help precisely estimate psychological frailty's prevalence and with the comparison of research findings. Therefore, a scoping review of psychological frailty is required as no study has comprehensively evaluated its definition and components to date.

1.1 Study objectives

Our primary objective was to provide a comprehensive overview of the conceptualization of psychological frailty in the literature. Our secondary objective was to summarize how psychological frailty is measured in the available literature.

2. Methods

This review adhered to the methodological framework of the Joanna Briggs Institute's (JBI) Manual for Evidence Synthesis [12] and the PRISMA guidelines extension statement for scoping reviews (PRISMA-ScR) [13]. Ethical approval was not required because the study did not directly involve participants and solely relied on published documents for analysis.

2.1 Inclusion and exclusion criteria

The inclusion and exclusion criteria were based on the participants-concept-context framework recommended in the JBI manual [12].

2.1.1 *Types of participants*

We included studies involving people aged ≥ 65 years. There were no limitations regarding other demographic characteristics (e.g., sex, ethnicity, or education level).

2.1.2 *Concept*

We examined the core concept of psychological frailty and included studies that defined it or described its components. We excluded studies solely focusing on physical frailty and not mentioning psychological frailty.

2.1.3 *Context*

We included studies with older adults residing in any setting (e.g., nursing homes, hospitalized, and community-dwelling).

2.1.4 *Types of studies included*

We included observational and qualitative studies on psychological frailty published between January 2003 and March 2022. As frailty was hypothesized to include a psychological dimension in 2003 [14], articles published before that were eliminated. Only English language publications were included to avoid misunderstandings during the translation.

2.1.5 *Types of sources*

The information sources included electronic databases, gray literature, and books. A literature search was conducted using five electronic databases: Scopus, PubMed, Web of Science Core

Collection, Cumulative Index to Nursing and Allied Health Literature (CINAHL), and PsycINFO. Additional studies were obtained by screening the reference lists of the included literature. We also identified gray literature through relevant websites (e.g., databases, Google) and individualized requests to key informants (gray literature authors). Additionally, we set an email alert (in PubMed) to receive updates regarding recently published studies.

2.2 Search strategy

We employed a hybrid syntax of MeSH or free-text terms (or both) for searching relevant literature. The search strategy was based on the following core aspects of this review:

- (1) Participants: “older adults,” “older people,” “elder,” and similar terms.
- (2) Concept: “psychological frailty.”
- (3) Context: “geriatric,” “frailty,” and similar terms.

All authors drafted a search strategy for each database after consulting an experienced librarian. **Supplementary Material 1** presents the complete search strategy.

2.3 Search process

The literature search results were imported into a bibliographic software (EndNote version 20.0, Thompson Reuters) and duplicates were deleted. Two authors identified potentially relevant studies by screening the titles, abstracts, and keywords of the identified studies. After this, they compared the initial findings of this review to reach a consensus. Two authors independently screened full-text articles for the inclusion and exclusion criteria. Any inconsistencies in literature selection between the two authors were resolved by all authors to reach a consensus. All the reasons for exclusion were documented and are presented in the PRISMA 2020 flowchart (**Figure 1**).

2.4 Data extraction

The characteristics of eligible studies were extracted following a pre-specified data extraction table, comprising authors (publication year), countries or regions, research design (sample size), setting, measurements, components, and definition of psychological frailty. All authors jointly developed the extraction details per the JBI extraction template [12]. Two authors independently extracted the data. Any inconsistencies were resolved by consulting other authors. Furthermore, if the data needed clarification or were missing key information, the

authors of the relevant studies were contacted.

2.5 Strategy for data synthesis

Several definitions and measurements of psychological frailty were entered into the data extraction table for narrative analysis. We manually grouped and appraised these definitions and features to derive a comprehensive definition of psychological frailty or a framework for defining it. While synthesizing the measurement tools, we coded each psychological frailty measurement, the instrument's name, the included domains that were assessed, and the number of domains.

3. Results

3.1 Characteristics of the included publications

The search yielded 2,672 records across five electronic databases (**Supplementary Material 1**). We identified six additional publications from other sources. We screened 173 studies after removing duplicates and irrelevant records. Of these, 19 were excluded after screening the titles, abstracts, and keywords. The remaining 154 studies were considered for full-text review, and 96 did not meet our eligibility criteria. Fifty-eight publications were included in this review (**Figure 1**).

Of these, 38 (65.5%) utilized a cross-sectional design, 16 (27.6%) a longitudinal design, and four (6.9%) were theoretical analyses. Over two-thirds of these studies (67.3%) originated from Europe, with 21 (36.2%) conducted in the Netherlands, three in Belgium, two in the United Kingdom, and one in Denmark. The remaining included five in China (four in mainland China and one in Hong Kong), three in Japan, and two in Canada. **Supplementary Table 1** briefly describes these studies.

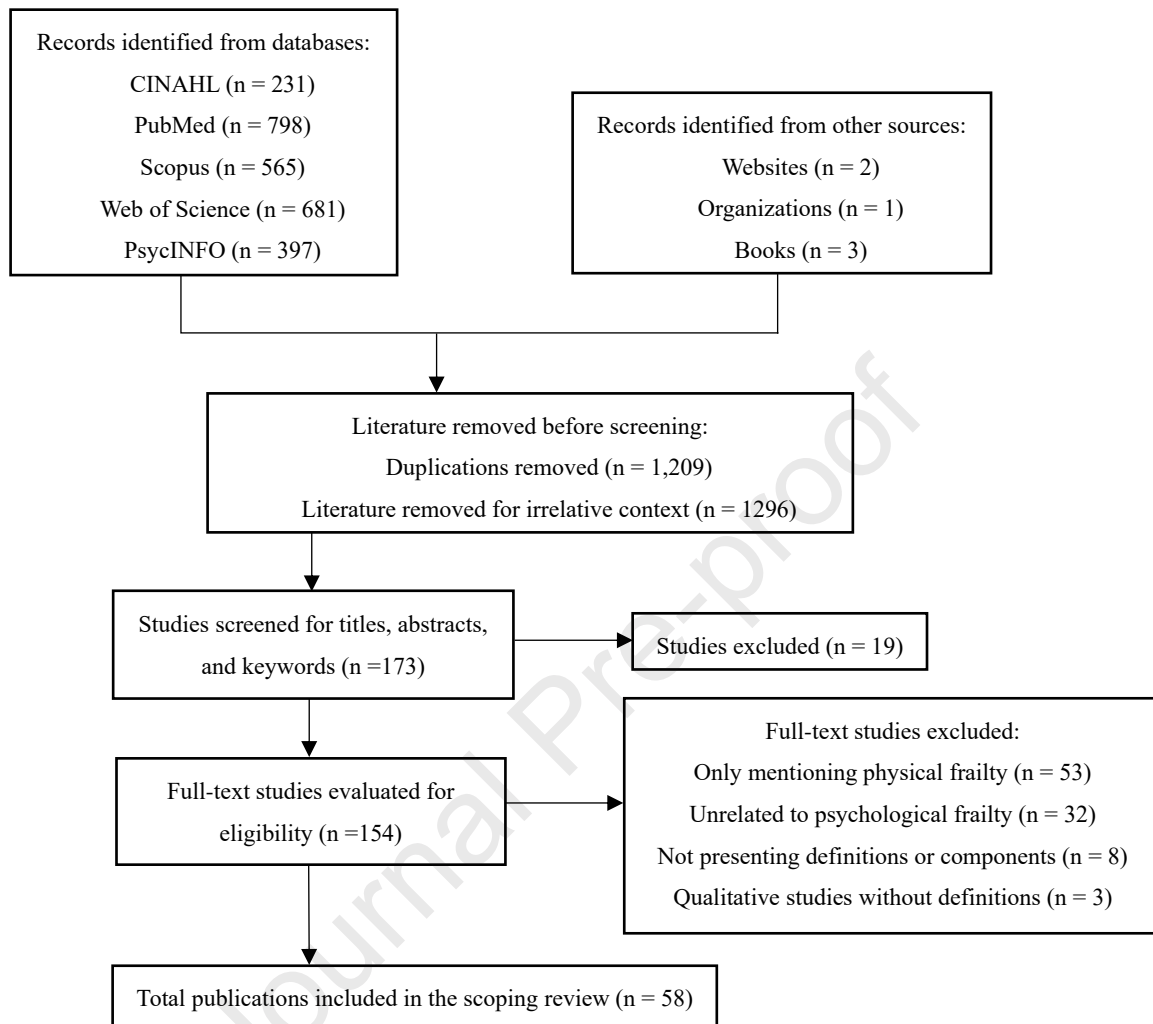


Figure 1. PRISMA flowchart of literature selection

3.2 Definitions of psychological frailty

Of the 58 studies included, 40 defined psychological frailty, seven focused on novel definitions [5, 7, 11, 27, 36, 40, 53], and 33 referenced definitions from other authors. To measure psychological frailty, Gobbens et al. [7] described it as a concept that included cognitive, mood, and coping-related features. They developed a new measurement tool, the Tilburg Frailty Indicator (TFI), to evaluate frailty comprehensively [18]. Twenty-eight of the included studies applied Gobbens et al.'s definition [7], indicating that it was recognized and frequently used (**Supplementary Table 1**).

De Witte et al. [5] introduced an operational definition of psychological frailty as the co-

existence of loneliness and mood disorders (**Supplementary Table 1**). Psychological frailty has also been described as a phenotype of mental frailty operationally defined as two or more of the following items: depression, cognitive impairment, low quality of life, and low cognitive self-concept [53]. Similarly, Teo et al. [41] defined *mental frailty* as meeting one or more of the following criteria: low mood, cognitive impairment, and poor self-rated health. As a theoretical construct, Fitten [27] described psychological frailty as brain alterations that are deviations from natural aging but are not necessarily diseases. They contribute to decreased mood or cognitive resilience when confronted with minor stressors and might induce adverse health results similar to physical frailty. Patel et al. [36] defined it as an individual's inherent features that predispose them to adversity. Rietman et al. [11] conceptualized it as the fulfillment of criteria for both general mental health and depression. Shimada et al. [40] defined it as the co-existence of depression and physical frailty. Researchers (e.g., Shimada et al. [40]) have emphasized the importance of considering psychological frailty together with other frailty domains (e.g., physical) for a comprehensive definition of frailty.

3.3 Components of psychological frailty

All included studies provided information on various components of psychological frailty. Of these, we identified the following four sets of components that were most frequently used (**Supplementary Table 1**):

- (1) Mood problems were one of the most frequently cited components, including depression, sadness, and anger [54,55]. Most researchers considered mood problems, especially depression, a core component of psychological frailty [51,52].
- (2) Cognitive problems included cognitive impairment or deficiency and symptoms, dementia, poor concentration, memory loss, and related cognitive issues [44,45]. Despite some debates, cognitive problems were one of the most commonly referenced components of psychological frailty.
- (3) Other mental health problems covered a wide spectrum of issues regarding psychological health, including anxiety, coping, and loneliness [49,56].
- (4) Fatigue-related problems were also documented in several publications, including fatigue, exhaustion, listlessness, and loss of energy [8,57]. These problems likely overlapped with those in the frailty phenotype model [58]. Fatigue-related problems

were highlighted as key components of psychological frailty [40].

3.4 Defining criteria and measurements of psychological frailty

Overall, 28 measurement tools were used to assess psychological frailty (**Supplementary Table 1**). Of these, ten studies provided their measurement tools for psychological frailty or the psychological domain of frailty. The *TFI* was the most frequently used measurement tool for psychological frailty. It is a self-report scale developed by Gobbens et al. [18] and covers physical (eight questions), social (three questions), and psychological (four questions) domains. The psychological domain is assessed using three yes-sometimes-or-no questions on cognition, anxiety, and depression, and one yes-or-no question on coping. From these, a score of psychological frailty ranging from zero to four is derived. A higher score represents a more severe level of psychological frailty.

The *GFI* was another common screening tool for frailty comprising four domains (including physical, cognitive, social, and psychological; 15 questions). The psychological domain is assessed using two questions on sadness and anxiety. Individuals with a total score of at least one on this dimension are considered psychologically frail [24,59].

Various mental health assessment tools were used to measure psychological frailty. Shimada et al. [40] utilized the 15-item *Geriatric Depression Scale* (GDS-15) and *Fried frailty phenotype* to screen for psychological frailty. They defined psychological frailty as the coexistence of depression (GDS-15 score of at least four or five) and physical frailty (meeting at least three criteria for the frailty phenotype). Nishida et al. [46] only measured depressive mood (defined as a score of at least two on the depression domain of the frailty checklist) to represent psychological frailty. The *Center for Epidemiologic Studies Depression Scale* and the five-item *Mental Health Inventory* were also used to assess psychological frailty, which was defined as screening positive for both measures [11]. **Supplementary Table 1** presents details of other measurement tools for psychological frailty.

4. Discussion

4.1 Existing definitions, components, and measurements

Psychological frailty can be a multidimensional construct referring to a state of mental

vulnerability and declined psychological resilience that should be characterized by a combination of cognitive, emotional, fatigue, and other factors. Despite the increased interest in psychological frailty, there is still a lack of consensus on its conceptualization and measurement. This scoping review aims to explore the diversity of definitions, components, and measures of psychological frailty in different literature and outlines key themes and gaps in existing definitions and measures of psychological frailty.

Despite several empirical studies examining psychological frailty in recent years, few studies have explored its definition. While several studies have explored how psychological frailty may be defined, we discovered that these definitions lacked consistency and consensus. For instance, one study defined psychological frailty as the co-existence of depression and physical frailty [40]. Contrastingly, other studies defined it without physical frailty as a component [11,36]. Some incorporated cognitive components into it [18,27], while they were not considered in others [41]. A possible reason is the lack of agreement regarding the theoretical framework of psychological frailty. This concern also applies to the general concept of frailty, which lacks a clear theoretical foundation [65]. Another potential explanation is the lack of effort among researchers to unanimously agree on a definition. Although more studies have tried incorporating psychological domains in frailty research, few have specifically focused on conceptualizing it. Our review revealed that only seven studies provided novel definitions of psychological frailty over the past two decades.

We found several issues regarding the conceptualization of psychological frailty. One issue is the selection of diverse psychological functions for defining psychological frailty. We found that the psychological functions incorporated into the definitions of psychological frailty overlapped in numerous studies [40,51,60]. However, the lack of consistent criteria for selecting psychological functions made it difficult to reach a consensus. We found little evidence for establishing an association between individual psychological functions and the overall concept of psychological frailty. We classified the numerous individual components reported across studies into four groups: mood, cognitive, fatigue-related, and other mental health problems. Although this classification may be imperfect, it systematically arranges these components into multiple categories based on similarity.

Most studies did not clearly articulate their theoretical framework [45,60], which may be the source of the above issues. Some studies defined it using a single or small number of mental health items, such as depression [52]. There was little to no consideration of the difference between mental disorders and psychological frailty and what “frailty” implied in specific psychological domains. Psychological frailty should be closely linked to the risks associated with mental disorders as a subtype of frailty. It is reasonable to assume that psychological frailty is closely associated with mental disorders and that psychological frailty may be a precursor or risk factor for the onset of mental disorders in late life based on some studies [10, 69, 70]. Otherwise, psychological frailty’s concept would overlap extensively with that of mental disorders. However, there are distinctly different clinical symptoms between the two concepts, although they may share common risk factors [69, 70].

Frailty in the psychological context should be multifactorial and incorporate features of psychological functioning and physical-vulnerability-related conditions, such as fatigue and exhaustion (**Figure 2**). Psychological frailty may result from age-related deficits in psychological resilience and brain reserves. *Psychological resilience* is an individual’s capacity to cope with stressors and adversity, allowing them to maintain their physical and mental health successfully [61,62]. *Brain reserve* (or brain resilience) is an individual’s ability to withstand age-related and pathological changes in the brain [63]. Age-related declines in psychological resilience and brain reserves indicate the progressive impact of aging on the brain and the emergence of psychological frailty. Hence, psychological frailty may be described as a decreased state of psychological resilience and brain reserves caused by various physiological aging processes in the brain. This state is potentially reversible and analogous to cognitive frailty [64]. However, further evidence is required to validate this hypothesis.

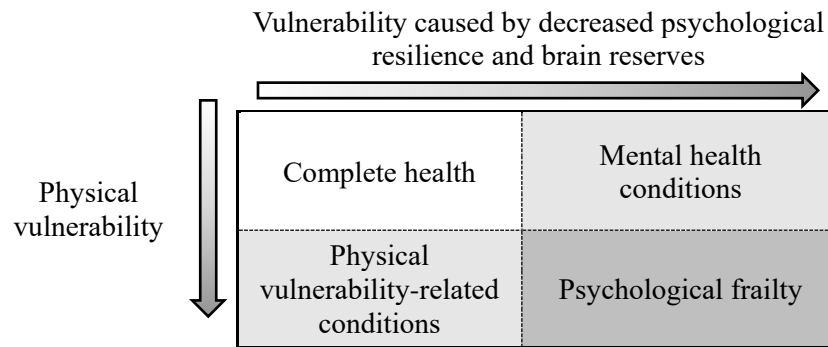


Figure 2. A schematic diagram of the definition of psychological frailty. At the global person level, the model also appears to consider an individual's physical, mental, and spiritual health. From the perspective of physical functioning, deterioration in sleep, exercise, and medical health are all potential sources of an individual's psychological frailty. From a mental health perspective, aspects such as emotional control, cognitive functioning, and coping mechanisms can all contribute to the development of psychological frailty. In addition, the loss of a sense of meaning and purpose also seems to produce psychological frailty from a spiritual health perspective. Accordingly, psychological frailty and frailty in these domains (e.g., physical, spiritual) have very complex interactions. The reason for this lies in our vague perception of the boundaries of each concept.

Our review also revealed that physical, social, and cognitive problems (or frailty) were components that were frequently incorporated into psychological frailty. However, the similarities and differences between these domains have not been extensively examined within a comprehensive framework of frailty [66]. Psychological frailty may co-exist with other frailty domains. For example, there is an overlap in components between psychological and social frailty [5, 29]. Individuals can be affected by many negative effects of social support and social participation or their lack thereof. Social isolation and loneliness can lead to negative psychological outcomes such as depression and anxiety, which in turn are clearly associated with psychological frailty. Furthermore, some components of physical frailty are frequently incorporated into definitions of psychological frailty, which is viewed as a continuum of frailty that includes aspects of the mind–body interaction. The components of physical frailty involved in psychological frailty vary from study to study, but typically include fatigue, exhaustion, and listlessness. However, psychological frailty and physical frailty are distinct concepts, the biggest difference being that physical frailty tends to describe

vulnerability in physical functions, while psychological frailty emphasizes vulnerability on a mental or spiritual level. This highlights the complexity and heterogeneity of psychological frailty as a construct.

Another critical issue is that precise measurements of psychological frailty are required. Our review demonstrated that most measurement tools were designed to assess one or several psychological functions, mental disorders, or comprehensive frailty. However, tools explicitly built to assess psychological frailty were not identified. Nevertheless, psychological frailty may be assessed as part of comprehensive frailty assessments, such as the *GFI* and the *TFI*.

Additionally, the findings of this scoping review demonstrate that the *deficit accumulation model* [67] and *Fried frailty phenotype* [58], together with psychological items, have frequently been used to measure psychological frailty. The *deficit accumulation model of frailty* [67] may be more suitable for assessing psychological frailty and is used more widely across studies than the *frailty phenotype*. The model can incorporate any health deficit, including psychological deficits. Several studies have adopted this approach to create measurement tools for psychological frailty. For instance, Kwan et al. [29] constructed a comprehensive frailty model and assessed psychological domains using items on positive and negative psychological well-being per the cumulative deficit approach. Whether these measures are valid to assess psychological frailty remains unknown, as there is a lack of a clear definition of psychological frailty and there is no gold standard to compare these measurement tools.

A possible direction for future research is the development of a clear definition and gold standard measurement tool for psychological frailty. This may be accomplished through expert consultation sessions with clinicians and researchers to gather a wide range of perspectives and insights on psychological frailty. Furthermore, the *TFI*, one of the most widely used tools for measuring psychological frailty, has received the most extensive examination in terms of its psychometric properties [34, 35]. Although the *TFI* has been psychometrically assessed, the reliability and validity of several other measures of psychological frailty included in the review were unassessed [68].

4.2 Implications of future research

A comprehensive and unanimous definition of psychological frailty is required. First, a firm theoretical framework for psychological frailty should be established through group discussions among experts from multiple research areas. These experts should have expertise in frailty, mental health, geriatrics, nursing, and other related fields. A unanimous statement should address the question, “What is psychological frailty?” This would likely incorporate various psychological functions (e.g., perception, attention, reasoning, mood, language, and memory) and multiple components of physical (and/or cognitive and/or social and/or spiritual) frailty, reflecting its complexities and characterizing it as a flexible and multifaceted concept. Second, based on this theoretical framework, psychological frailty’s operational definition should be very specific. The definition could provide a foundation for designing successful and valid measurement tools for assessing psychological frailty.

Future research should clarify the differences between the psychological and the other domains of frailty, including physical, social, and cognitive. This could help identify possible similarities and differences between their definitions. These domains may be inherently interconnected and result from normal and pathological aging [53]. This also points to the need for developing a specific scale to assess psychological frailty, which currently does not have a valid measurement tool. Ideally, subjective and objective measures should be included for measuring psychological frailty. Items from existing gold standard measurements, such as the *Fried frailty phenotype* and *DSM-5 criteria*, should be incorporated where possible. Additionally, the psychometric characteristics of such measurement tools for psychological frailty should be systematically investigated.

4.3 Limitations of the study

A potential limitation of this review is its search strategy. Our review focused solely on psychological frailty and excluded similar concepts, such as mental or emotional frailty as they have rarely been investigated and applied in existing research. Furthermore, we did not explore the psychometric properties of the different measurement tools used to identify psychological frailty.

5. Conclusions

Psychological frailty is a complex concept with no universal definition. As a multifactorial concept, psychological frailty should include some components of mental, spiritual, social and physical vulnerability. Depression and anxiety are frequently used as its core. We suggest several future research directions for an improved conceptualization of psychological frailty. A precise definition and improved understanding of psychological frailty might encourage its use in clinical settings and contribute to an improved description of frailty at the psychological or neural levels.

Journal Pre-proof

Acknowledgements: We thank our librarian (Ms. Lydia Ngai) of the Faculty of Health and Social Sciences at the Hong Kong Polytechnic University, who provided specialized advice regarding the literature search strategy.

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors. JM is funded by the National Institute for Health and Care Research (NIHR) Maudsley Biomedical Research Centre at South London and Maudsley NHS Foundation Trust and King's College London. The views expressed are those of the authors and not necessarily those of the NHS, the NIHR, or the Department of Health and Social Care.

Declaration of interests: None

Data statement: All data reported here were sourced from existing publications.

References

- [1] Dent E, Martin FC, Bergman H, Woo J, Romero-Ortuno R, Walston JD. Management of frailty: opportunities, challenges, and future directions. *Lancet*. 2019;394:1376–86. [https://doi.org/10.1016/S0140-6736\(19\)31785-4](https://doi.org/10.1016/S0140-6736(19)31785-4).
- [2] WHO. Constitution of the World Health Organization-basic documents. 45th ed. Geneva: WHO; 2006.
- [3] Buchman AS, Bennett DA. Cognitive frailty. *J Nutr Health Aging*. 2013;17:738–9. <https://doi.org/10.1007/s12603-013-0397-9>.
- [4] Khezrian M, Myint PK, McNeil C, Murray AD. A review of frailty syndrome and its physical, cognitive and emotional domains in the elderly. *Geriatrics*. 2017;2. <https://doi.org/10.3390/geriatrics2040036>.
- [5] De Witte N, De Donder L, Dury S, Buffel T, Vert D, Schols JOS. A theoretical perspective on the conceptualisation and usefulness of frailty and vulnerability measurements in community dwelling older persons. *Aporia*. 2013;5:13–21.
- [6] Hogan DB. Models, definitions, and criteria for frailty. In: Ram J, Conn PM, editors. *Conn's handbook of models for human aging*, Cambridge: Elsevier; 2018, p. 35–44.
- [7] Gobbens RJJ, Luijckx KG, Wijnen-Sponselee MT, Schols JM. Towards an integral conceptual model of frailty. *J Nutr Health Aging*. 2010;14:175–81. <https://doi.org/10.1007/s12603-010-0045-6>.
- [8] Shin J, Kim M, Choi J. Development and validation of a multidimensional frailty scale for

- clinical geriatric assessment. *J Nutr Health Aging*. 2021;25:938–43. <https://doi.org/10.1007/s12603-021-1652-0>.
- [9] Mitnitski AB, Mogilner AJ, Rockwood K. Accumulation of deficits as a proxy measure of aging. *ScientificWorldJournal*. 2001;1:323–36. <https://doi.org/10.1100/tsw.2001.58>.
- [10] Mutz J, Choudhury U, Zhao J, Dregan A. Frailty in individuals with depression, bipolar disorder and anxiety disorders: longitudinal analyses of all-cause mortality. *BMC Med*. 2022;20:274. <https://doi.org/10.1186/s12916-022-02474-2>.
- [11] Rietman ML, Der Van A DL, Van Oostrom SH, Picavet HSJ, Dollé MET, Van Steeg H, Verschuren WMM, Spijkerman AMW. The association between BMI and different frailty domains: a u-shaped curve? *J Nutr Health Aging*. 2018;22:8–15. <https://doi.org/10.1007/s12603-016-0854-3>
- [12] Peters MD, Godfrey C, McInerney P, Munn Z, Tricco AC, Khalil H. Chapter 11: scoping reviews. In: Aromataris E, Munn Z, editors. *JBI Manual for Evidence Synthesis*, Australia: JBI; 2020.
- [13] Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D et al. PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Ann Intern Med*. 2018;169:467–73. <https://doi.org/10.7326/M18-0850>.
- [14] Markle-Reid M, Browne G. Conceptualizations of frailty in relation to older adults. *J Adv Nurs*. 2003;44:58–68. <https://doi.org/10.1046/j.1365-2648.2003.02767.x>.
- [15] Puts MTE, Lips P, Deeg DJH. Static and dynamic measures of frailty predicted decline in performance-based and self-reported physical functioning. *J Clin Epidemiol*. 2005;58:1188–98. <https://doi.org/10.1016/j.jclinepi.2005.03.008>.
- [16] Rolfson DB, Majumdar SR, Tsuyuki RT, Tahir A, Rockwood K. Validity and reliability of the Edmonton Frail Scale. *Age Ageing*. 2006;35:526–9. <https://doi.org/10.1093/ageing/afl041>.
- [17] Gu D, Dupre ME, Sautter J, Zhu H, Liu Y, Yi Z. Frailty and mortality among Chinese at advanced ages. *J Gerontol B Psychol Sci Soc Sci*. 2009;64:279–89. <https://doi.org/10.1093/geronb/gbn009>.
- [18] Gobbens RJJ, van Assen MAL, Luijkx KG, Wijnen-Sponselee MT, Schols JM. The Tilburg Frailty Indicator: psychometric properties. *J Am Med Dir Assoc*. 2010;11:344–55. <https://doi.org/10.1016/j.jamda.2009.11.003>.
- [19] Gobbens RJJ, van Assen MAL, Luijkx KG, Wijnen-Sponselee MT, Schols JM. Determinants of frailty. *J Am Med Dir Assoc*. 2010;11:356–64. <https://doi.org/10.1016/j.jamda.2009.11.008>.
- [20] Gobbens RJJ, van Assen MA, Luijkx KG, Schols JM. Testing an integral conceptual model of frailty. *J Adv Nurs*. *John Wiley & Sons, Inc*. 2012;68:2047–60. <https://doi.org/10.1111/j.1365-2648.2011.05896.x>.
- [21] Gobbens RJJ, van Assen MALM, Luijkx KG, Schols JM. The predictive validity of the Tilburg frailty indicator: disability, health care utilization, and quality of life in a population at risk. *Gerontologist*. 2012;52:619–31. <https://doi.org/10.1093/geront/gnr135>.
- [22] Gobbens RJJ, van Assen MA. Frailty and its prediction of disability and health care utilization: the added value of interviews and physical measures following a self-report

- questionnaire. *Arch Gerontol Geriatr.* 2012;55:369–79.
<https://doi.org/10.1016/j.archger.2012.04.008>.
- [23] De Witte N, Gobbens R, De Donder L, Dury S, Buffel T, Schols J et al. The comprehensive frailty assessment instrument: development, validity and reliability. *Geriatr Nurs.* 2013;34:274–81. <https://doi.org/10.1016/j.gerinurse.2013.03.002>.
- [24] Ament BHL, de Vugt ME, Verhey FRJ, Kempen GIJM. Are physically frail older persons more at risk of adverse outcomes if they also suffer from cognitive, social, and psychological frailty? *Eur J Ageing.* 2014;11:213–9. <https://doi.org/10.1007/s10433-014-0308-x>.
- [25] Gobbens RJJ, van Assen MALM. The prediction of quality of life by physical, psychological and social components of frailty in community-dwelling older people. *Qual Life Res.* 2014;23:2289–300. <https://doi.org/10.1007/s11136-014-0672-1>.
- [26] Coelho T, Paúl C, Gobbens RJJ, Fernandes L. Determinants of frailty: the added value of assessing medication. *Front Aging Neurosci.* 2015;7:56.
<https://doi.org/10.3389/fnagi.2015.00056>.
- [27] Fitten LJ. Psychological frailty in the aging patient. *Nestlé Nutr Inst Workshop Ser.* 2015;83:45–53.
- [28] Gobbens RJJ, Krans A, van Assen MALM. Validation of an integral conceptual model of frailty in older residents of assisted living facilities. *Arch Gerontol Geriatr.* 2015;61:400–10.
<https://doi.org/10.1016/j.archger.2015.06.001>.
- [29] Kwan JS, Lau BH, Cheung KS. Toward a comprehensive model of frailty: an emerging concept from the Hong Kong centenarian study. *J Am Med Dir Assoc.* 2015;16:536.e1–7.
<https://doi.org/10.1016/j.jamda.2015.03.005>.
- [30] Peters LL, Boter H, Burgerhof JG, Slaets JP, Buskens E. Construct validity of the Groningen Frailty Indicator established in a large sample of home-dwelling elderly persons: evidence of stability across age and gender. *Exp Gerontol.* 2015;69:129–41.
<https://doi.org/10.1016/j.exger.2015.05.006>.
- [31] Roppolo M, Mulasso A, Gobbens RJ, Mosso CO, Rabaglietti E. A comparison between uni- and multidimensional frailty measures: prevalence, functional status, and relationships with disability. *Clin Interv Aging.* 2015;10:1669–78. <https://doi.org/10.2147/CIA.S92328>.
- [32] Gobbens RJJ, van Assen MALM. Explaining frailty by lifestyle. *Arch Gerontol Geriatr.* 2016;66:49–53. <https://doi.org/10.1016/j.archger.2016.04.011>.
- [33] Coelho T, Paúl C, Gobbens RJJ, Fernandes L. Multidimensional frailty and pain in community dwelling elderly. *Pain Med.* 2017;18:693–701.
<https://doi.org/10.1111/pme.12746>.
- [34] Dong L, Liu N, Tian X, Qiao X, Gobbens RJJ, Kane RL et al. Reliability and validity of the Tilburg Frailty Indicator (TFI) among Chinese community-dwelling older people. *Arch Gerontol Geriatr.* 2017;73:21–8. <https://doi.org/10.1016/j.archger.2017.07.001>.
- [35] Gobbens RJJ, Schols JM, van Assen MA. Exploring the efficiency of the Tilburg Frailty Indicator: a review. *Clin Interv Aging.* 2017;12:1739–52.
<https://doi.org/10.2147/CIA.S130686>.
- [36] Patel H, Clift E, Lewis L, Cooper C. Epidemiology of sarcopenia and frailty. In:

Dionyssiotis Y, editor. Frailty and sarcopenia – onset, development and clinical challenges, London: IntechOpen; 2017, p. 7.

[37] Ma L, Tang Z, Zhang L, Sun F, Li Y, Chan P. Prevalence of frailty and associated factors in the community-dwelling population of China. *J Am Geriatr Soc.* 2018;66:559–64.

<https://doi.org/10.1111/jgs.15214>.

[38] Vrotsou K, Machón M, Rivas-Ruiz F, Carrasco E, Contreras-Fernández E, Mateo-Abad M et al. Psychometric properties of the Tilburg Frailty Indicator in older Spanish people.

Arch Gerontol Geriatr. 2018;78:203–12. <https://doi.org/10.1016/j.archger.2018.05.024>.

[39] Salem BE, Brecht ML, Ekstrand ML, Faucette M, Nyamathi AM. Correlates of physical, psychological, and social frailty among formerly incarcerated, homeless women. *Health Care Women Int.* 2019;40:788–812. <https://doi.org/10.1080/07399332.2019.1566333>.

[40] Shimada H, Lee S, Doi T, Bae S, Tsutsumimoto K, Arai H. Prevalence of psychological frailty in Japan: NCGG-SGS as a Japanese National cohort study. *J Clin Med.* 2019;8:1554.

<https://doi.org/10.3390/jcm8101554>.

[41] Teo N, Yeo PS, Gao Q, Nyunt MSZ, Foo JJ, Wee SL et al. A bio-psycho-social approach for frailty amongst Singaporean Chinese community-dwelling older adults - evidence from the Singapore Longitudinal Aging Study. *BMC Geriatr.* 2019;19:350.

<https://doi.org/10.1186/s12877-019-1367-9>.

[42] Verver D, Merten H, de Blok C, Wagner C. A cross sectional study on the different domains of frailty for independent living older adults. *BMC Geriatr.* 2019;19:61.

<https://doi.org/10.1186/s12877-019-1077-3>.

[43] Zhang X, Tan SS, Franse CB, Alhambra-Borrás T, Durá-Ferrandis E, Bilajac L et al. Association between physical, psychological and social frailty and health-related quality of life among older people. *Eur J Public Health.* 2019;29:936–42.

<https://doi.org/10.1093/eurpub/ckz099>.

[44] Garner IW, Burgess AP, Holland CA. Developing and validating the Community-Oriented Frailty Index (COM-FI). *Arch Gerontol Geriatr.* 2020;91:104232.

<https://doi.org/10.1016/j.archger.2020.104232>.

[45] Gobbens RJJ, Andreason J. The prediction of readmission and mortality by the domains and components of the Tilburg Frailty Indicator (TFI): a prospective cohort study among acutely admitted older patients. *Arch Gerontol Geriatr.* 2020;89:104077.

<https://doi.org/10.1016/j.archger.2020.104077>.

[46] Nishida T, Yamabe K, Honda S. Dysphagia is associated with oral, physical, cognitive and psychological frailty in Japanese community-dwelling elderly persons. *Gerodontology.* 2020;37:185–90. <https://doi.org/10.1111/ger.12455>.

[47] Ožić S, Vasiljev V, Ivković V, Bilajac L, Rukavina T. Interventions aimed at loneliness and fall prevention reduce frailty in elderly urban population. *Medicine.* 2020;99:e19145.

<https://doi.org/10.1097/MD.00000000000019145>.

[48] Zhang Y, Xu XJ, Lian TY, Huang LF, Zeng JM, Liang DM et al. Development of frailty subtypes and their associated risk factors among the community-dwelling elderly population. *Aging (Albany, NY).* 2020;12:1128–40. <https://doi.org/10.18632/aging.102671>.

- [49] Gobbens RJJ, van Assen MALM, Augustijn H, Goumans M, van der Ploeg T. Prediction of mortality by the Tilburg Frailty Indicator (TFI). *J Am Med Dir Assoc*. 2021;22:607.e1–6. <https://doi.org/10.1016/j.jamda.2020.07.033>.
- [50] Gobbens RJJ, van der Ploeg T. The development of multidimensional frailty over seven years A longitudinal study among Dutch community-dwelling older people using the Tilburg Frailty Indicator. *Arch Gerontol Geriatr*. 2021;95:104393. <https://doi.org/10.1016/j.archger.2021.104393>.
- [51] Ye L, Elstgeest LEM, Zhang X, Alhambra-Borrás T, Tan SS, Raat H. Factors associated with physical, psychological and social frailty among community-dwelling older persons in Europe: a cross-sectional study of Urban Health Centres Europe (UHCE). *BMC Geriatr*. 2021;21:422. <https://doi.org/10.1186/s12877-021-02364-x>.
- [52] Sugie M, Harada K, Nara M, Kugimiya Y, Takahashi T, Kitagou M et al. Prevalence, overlap, and interrelationships of physical, cognitive, psychological, and social frailty among community-dwelling older people in Japan. *Arch Gerontol Geriatr*. 2022;100:104659. <https://doi.org/10.1016/j.archger.2022.104659>.
- [53] Garre-Olmo J, Calvó-Perxas L, López-Pousa S, de Gracia Blanco M, Vilalta-Franch J. Prevalence of frailty phenotypes and risk of mortality in a community-dwelling elderly cohort. *Age Ageing*. 2013;42:46–51. <https://doi.org/10.1093/ageing/afs047>.
- [54] Brehmer-Rinderer B, Zeilinger EL, Radaljevic A, Weber G. The Vienna frailty questionnaire for persons with intellectual disabilities—revised. *Res Dev Disabil*. 2013;34:1958–65. <https://doi.org/10.1016/j.ridd.2013.03.004>.
- [55] Ernsth Bravell M, Westerlind B, Midlöv P, Östgren CJ, Borgquist L, Lannering C et al. How to assess frailty and the need for care? Report from the Study of Health and Drugs in the Elderly (SHADES) in community dwellings in Sweden. *Arch Gerontol Geriatr*. 2011;53:40–5. <https://doi.org/10.1016/j.archger.2010.06.011>.
- [56] Hoeyberghs LJ, Verté E, Verté D, Schols JMGA, De Witte N. The importance of sources of meaning in life of community dwelling psychologically frail older people. *Working Older People*. 2019;23:65–76. <https://doi.org/10.1108/WWOP-01-2019-0001>.
- [57] Schoufour JD, Mitnitski A, Rockwood K, Evenhuis HM, Echteld MA. Development of a frailty index for older people with intellectual disabilities: results from the HA-ID study. *Res Dev Disabil*. 2013;34:1541–55. <https://doi.org/10.1016/j.ridd.2013.01.029>.
- [58] Fried LP, Tangen CM, Walston J, Newman AB, Hirsch C, Gottdiener J et al. Frailty in older adults: evidence for a phenotype. *J Gerontol A Biol Sci Med Sci*. 2001;56:M146–56. <https://doi.org/10.1093/gerona/56.3.m146>.
- [59] Steverink N, Slaets J, Schuurmans H, Lis M. Measuring frailty: developing and testing the GFI (Groningen Frailty Indicator). *Gerontologist*. 2001;41:236–7.
- [60] Venturini C, Sampaio RF, de Souza Moreira B, Ferriolli E, Neri AL, Lourenço RA et al. A multidimensional approach to frailty compared with physical phenotype in older Brazilian adults: data from the FIBRA-BR study. *BMC Geriatr*. 2021;21:246. <https://doi.org/10.1186/s12877-021-02193-y>.
- [61] Afek A, Ben-Avraham R, Davidov A, Berezin Cohen N, Ben Yehuda A, Gilboa Y et al. Psychological resilience, mental health, and inhibitory control among youth and young adults

- under stress. *Front Psychiatry*. 2020;11:608588. <https://doi.org/10.3389/fpsy.2020.608588>.
- [62] Fletcher D, Sarkar M. Psychological resilience: a review and critique of definitions, concepts, and theory. *Eur Psychol*. 2013;18:12–23. <https://doi.org/10.1027/1016-9040/a000124>.
- [63] Fratiglioni L, Wang HX. Brain reserve hypothesis in dementia. *J Alzheimers Dis*. 2007;12:11–22. <https://doi.org/10.3233/jad-2007-12103>.
- [64] Bémeur C, Rose CF. Hepatic encephalopathy, sarcopenia, and frailty. In: Tandon P, Montano-Loza AJ, editors. *Frailty and sarcopenia in cirrhosis*, Berlin: Springer; 2020, p. 247–63.
- [65] Bergman H, Ferrucci L, Guralnik J, Hogan DB, Hummel S, Karunanathan S et al. Frailty: an emerging research and clinical paradigm--issues and controversies. *J Gerontol A Biol Sci Med Sci*. 2007;62:731–7. <https://doi.org/10.1093/gerona/62.7.731>.
- [66] van Oostrom SH, van der A DL, Rietman ML, Picavet HSJ, Lette M, Verschuren WMM et al. A four-domain approach of frailty explored in the Doetinchem Cohort Study. *BMC Geriatr*. 2017;17:196. <https://doi.org/10.1186/s12877-017-0595-0>.
- [67] Rockwood K, Mitnitski A. Frailty defined by deficit accumulation and geriatric medicine defined by frailty. *Clin Geriatr Med*. 2011;27:17–26. <https://doi.org/10.1016/j.cger.2010.08.008>.
- [68] Huang EY, Lam SC. Review of frailty measurement of older people: evaluation of the conceptualization, included domains, psychometric properties, and applicability. *Aging Med (Milton)*. 2021;4:272–91. <https://doi.org/10.1002/agm2.12177>.
- [69] Atkins JL, Jylhävä J, Pedersen NL, Magnusson PK, Lu Y, Wang Y et al. A genome-wide association study of the frailty index highlights brain pathways in ageing. *Aging Cell*. 2021;20:e13459. <https://doi.org/10.1111/acer.13459>.
- [70] Davies K, Maharani A, Chandola T, Todd C, Pendleton N. The longitudinal relationship between loneliness, social isolation, and frailty in older adults in England: a prospective analysis. *Lancet Healthy Longev*. 2021;2:e70-e77. [https://doi.org/10.1016/S2666-7568\(20\)30038-6](https://doi.org/10.1016/S2666-7568(20)30038-6).

Further reading

- Alqahtani BA, Abdelbasset WK, Alenazi AM. Psychometric analysis of the Arabic (Saudi) Tilburg Frailty Indicator among Saudi community-dwelling older adults. *Arch Gerontol Geriatr*. 2020;90:104128. <https://doi.org/10.1016/j.archger.2020.104128>.
- Andreasen J, Sørensen EE, Gobbens RJ, Lund H, Aadahl M. Danish version of the Tilburg Frailty Indicator—translation, cross-cultural adaptation and validity pretest by cognitive interviewing. *Arch Gerontol Geriatr*. 2014;59:32–8. <https://doi.org/10.1016/j.archger.2014.02.007>.
- Bielderman A, Van Der Schans CP, Van Lieshout MRJ, De Greef MHG, Boersma F, Krijnen WP et al. Multidimensional structure of the Groningen Frailty Indicator in community-dwelling older people. *BMC Geriatr*. 2013;13:86. <https://doi.org/10.1186/1471-2318-13-86>.
- Freitag S, Schmidt S, Gobbens RJ. Tilburg frailty indicator. German translation and

psychometric testing. *Z Gerontol Geriatr.* 2016;49:86–93. <https://doi.org/10.1007/s00391-015-0889-9>.

Kamaruzzaman S, Ploubidis GB, Fletcher A, Ebrahim S. A reliable measure of frailty for a community dwelling older population. *Health Qual Life Outcomes.* 2010;8:123.

<https://doi.org/10.1186/1477-7525-8-123>.

Rockwood K, Song X, MacKnight C, Bergman H, Hogan DB, McDowell I et al. A global clinical measure of fitness and frailty in elderly people. *CMAJ.* 2005;173:489–95.

<https://doi.org/10.1503/cmaj.050051>.

Uchmanowicz I, Jankowska-Polańska B, Uchmanowicz B, Kowalczyk K, Gobbens RJ. Validity and reliability of the polish version of the Tilburg Frailty Indicator (TFI). *J Frailty Aging.* 2016;5:27–32. <https://doi.org/10.14283/jfa.2015.66>.

van Assen MALM, Helmink JHM, Gobbens RJJ. Associations between lifestyle factors and multidimensional frailty: a cross-sectional study among community-dwelling older people. *BMC Geriatr.* 2022;22:7. <https://doi.org/10.1186/s12877-021-02704-x>.

Van der Elst MCJ, Schoenmakers B, Verté D, De Donder L, De Witte N, Dury S et al. The relation between age of retirement and frailty in later life? A cross-sectional study in Flemish older adults. *Arch Gerontol Geriatr.* 2021;96:104473.

<https://doi.org/10.1016/j.archger.2021.104473>.

Highlights

- This study aimed to review existing psychological frailty definitions.
- Following PRISMA and JBI guidelines, PCC eligibility criteria were used.
- Forty out of 58 included studies discussed psychological frailty's definition.
- Of the 40, 33 discussed existing definitions and seven provided new definitions.
- Tilburg frailty indicator was used most frequently to assess psychological frailty.

Journal Pre-proof

Declaration of interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

Journal Pre-proof

Author Statement

Jinlong Zhao: Conceptualization. **Jinlong Zhao and Justina Liu:** Methodology. **Jinlong Zhao:** Formal analysis. **Jinlong Zhao:** Software. **Jinlong Zhao:** Data curation, Writing-Original draft preparation. **Jinlong Zhao, Justina Liu, Stefanos Tyrovolas, and Julian Mutz:** Writing- Reviewing and Editing.

Journal Pre-proof