Md Daud et al.
Brunei International Medical Journal
2026;22:1-9

Brunei International Medical Journal

Review Article Open Access

Psychological Frailty and Mental Health Problems in Older Adults: A Scoping Review

Ahmad Zahid **MD DAUD**[1,2], Ponnusamy **SUBRAMANIAM***[3], Nurul Fatin **MALEK RIVAN**[3], Shyh Poh **TEO**[4,5], Moustafa **AHMED**[6,7]

Abstract

Background: Frailty is a health condition preceding impairment and disease, resulting in vulnerability and risk of poor outcomes. Frailty is a multidimensional geriatric syndrome encompassing physical, psychological and cognitive components. Psychological frailty refers to reduced emotional resilience, mood stability, and coping capacity. This paper aims to review the current literature on psychological frailty and mental health outcomes among older adults. **Methodology:** Four electronic databases, PubMed, Scopus, Science Direct and Web of science were used to systematically search for studies published between January 2019 and December 2023, that examined the effect of psychological frailty on mental health outcomes in older adults, including depression, anxiety, and overall well-being. **Results:** There were 154 articles screened, with 7 studies meeting inclusion criteria. All included studies assessed psychological frailty using the Tilburg Frailty Indicator (TFI), a multidimensional frailty tool with a psychological domain. Psychological frailty, as measured using the TFI, was consistently associated with depressive symptoms, anxiety, and reduced quality of life. The psychological domain of the TFI demonstrated moderate internal consistency (Cronbach's α = 0.712-0.797). **Conclusion:** Psychological frailty is a potential risk factor for the development of adverse mental health outcomes in older adults. The use of validated measures, such as the TFI may improve the identification of psychological frailty for early intervention strategies in both community and medical settings to protect older adults' mental health.

Keywords: Aged; Anxiety; Depression; Mental health; Psychological frailty

Correspondence*:

Dr. Ponnusamy SUBRAMANIAM
ponnusaami@ukm.edu.my

Author Details:
[1] Clinical Psychology and Behavioural Health Program, Universiti Kebangsaan Malaysia
[2] Clinical Psychology Unit, RIPAS Hospital, Brunei Darussalam
[3] Centre for Health Ageing & Wellness (HCARE), Universiti Kebangsaan Malaysia
[4] Geriatrics and Palliative Medicine, RIPAS Hospital, Brunei Darussalam
[5] PAPRSB Institute of Health Sciences, Universiti Brunei Darussalam, Brunei Darussalam
[6] Center for Data Analytics and School of Psychology, Faculty of Society and Design, Bond University, Gold Coast, Queensland, Australia.

INTRODUCTION

By 2050, the global population of older adults is estimated to reach 2.1 billion, more than double the 962 million older adults in 2017.[1] Low- and middle-income countries (LMIC) are expected to see a significant rise in the aging population, which will have substantial implications for their already vulnerable economies. In ageing populations, a concern with public health implications is an increased prevalence of frailty and vulnerability to disease.[2]

Frailty is a multidimensional geriatric syndrome that encompasses physical, psychological, and social components.[3,4] It represents a state of increased vulnerability and reduced physiological reserves, leading to a higher risk of adverse outcomes, such as disability, hospitalisation and mortality.[5,6] The concept of frailty is closely linked to age-related dysregulation of allostatic systems. Allostasis is the body's ability to achieve stability through changes in response to stress. When allostatic systems become less efficient, the allostatic load, or cumulative wear and tear due to repeated stress causes a reduced capacity to respond through a well-coordinated physiological response.[7] This leads to a vicious cycle of homeostenosis, a progressive decline in physiological reserves and increased vulnerability to stressors with increasing age.[7]

While earlier research predominantly focused on physical frailty, there is a growing acknowledgement that frailty includes other important domains, such as psychological and social dimensions that influence overall functioning and well-being in older adults.[8,9] Psychological frailty is an emerging concept referring to a decline in mental resilience, emotional regulation, and coping ability associated with ageing.[10] This involves vulnerabilities such as depressive symptoms, anxiety, poor self-efficacy, and reduced motivation, which can interact with physical and social deficits to worsen overall frailty.[11,12] Understanding this component is important because psychological changes may precede or exacerbate physical frailty, affecting mental health outcomes and quality of life.

While several tools have been developed to measure frailty in older adults, not all tools look at these different domains. However, the Tilburg Frailty Indicator (TFI) captures the physical, psychological, and social domains of frailty, providing a more comprehensive assessment.[13] The psychological subscale assesses aspects such as cognition, mood, and coping, providing a framework for evaluating psychological frailty. Despite its widespread use, there remains a limited synthesis of evidence regarding how psychological frailty, as measured by such tools, relate to mental health outcomes.

Given the increasing recognition of frailty as a multidimensional construct and the growing interest in the psychological component, this scoping review aims to map current evidence on the relationship between psychological frailty and mental health outcomes among older adults. It also identifies existing gaps in definitions, measurement tools, and research directions that can inform future studies and interventions.

METHODOLOGY

General Approach

This scoping review was conducted according to the five steps described by Arksey and O'Malley:[14] (1) Identifying research questions; (2) Identifying relevant studies; (3) Study selection; (4) Charting data, and (5) Collating, summarising and reporting results.[14] The study selection process followed the PRISMA-ScR guidelines for reporting scoping reviews.[15]

Identifying the Research Questions

The review was limited to articles in the English language published between January 2019 and December 2023. The electronic databases, PubMed, Scopus, Science Direct, and Web of Science, were searched to identify relevant studies. The inclusion criteria were full-text papers from peer-reviewed journals, and studies conducted specifically in older adults aged 60 years and above. The search identified relevant papers focused on measuring psychological frailty and its relationship to mental health outcomes, and studies that specifically reported mental health or psychological outcomes when analysing the impact of psychological frailty. The exclusion criteria were: articles published in languages other than English; reviews such as systematic reviews, meta-analyses, literature reviews, discussion papers, and book chapters; and articles that did not mention mental health or well-being outcomes.

The population, concept, and context (PCC) framework recommended by the Joanna Briggs Institute was used to ensure a structured approach to define eligibility criteria.[16] Search terms for the current review are displayed in **Table 1**. The search strategy was developed iteratively using Boolean operators, truncation, and synonyms, and was adapted for each database.

Table 1: PCC (Population, Concept, Context) Classification of the Review Queston on Psychological Frailty in Older Adults.

P (Population/Participants)	Old* OR Older* OR older adults*
C (Concept)	Psychological Frailty
C (Context)	Psychological Health OR Mental Health OR Depression OR depressive symptoms OR anxiety symptoms

Study Selection: During the initial screening phase, one reviewer examined all titles and abstracts to determine whether they met inclusion criteria. Full texts of potentially relevant publications were obtained by a second reviewer, who also cross-checked the reference lists of these papers to identify any additional eligible studies. The selected full-text papers underwent thorough evaluation and deliberation by both reviewers to determine suitability for inclusion in the review. Any disagreements regarding study inclusion were resolved through discussions between the two reviewers. Factors associated with psychological vulnerability, mental health outcomes, and measurement tools were extracted from each included study.

Charting the Data: The following categories were applied to the charting data for this analysis using Microsoft Excel: Author(s), Publication Year, Research Location, Study Population, Objective(s), Methods, Outcome Measures, and Significant Results. Relevant results from the included papers were incorporated into the review and the findings described in the following section. Charting was performed by one reviewer and verified by a second reviewer to ensure accuracy and consistency.

RESULTS

Figure 1 illustrates the PRISMA flow diagram. A search of the four electronic databases yielded 154 publications. After duplicate articles were removed, there were 114 articles evaluated for eligibility based on the title and abstract. The inclusion criteria applied to 15 publications, with eight papers subsequently excluded after full text review. Thus, seven papers were included in the current scoping review. The characteristics of the included studies are summarised in **Table 2**.

Study Characteristics: There were two studies from Asia (Taiwan and China),[20,21] while the remaining studies were from European countries; Portugal,[17] Spain,[18] Poland,[19] and the Netherlands.[22,23] All studies used a cross-sectional methodology, with one study being a longitudinal cohort study.[18]

Measure of Psychological Frailty: All seven studies assessed psychological frailty using the TFI.[17-23] Two studies translated the TFI into the participants' native languages, Chinese[21] and Polish.[19] The psychological domain of the TFI demonstrated moderate internal consistency (Cronbach α =0.712-0.797) in five studies.[17-19,21,22] Two studies did not conduct a reliability analysis and also did not report any validity information for the psychological domain of the TFI.[20,23] Overall, the TFI was consistently applied across settings, although the limited number of psychological items may restrict the depth of psychological frailty assessment.

Associated Mental Health Problems: Across the included studies, psychological frailty was consistently associated with several mental health outcomes, particularly depressive symptoms, anxiety, and reduced quality of life. Two studies (Bak and Wang papers) illustrated the relationship between psychological frailty and depressive symptoms, with higher levels of psychological frailty associated with greater depressive symptoms.[19,21] One study by Wang et al. found that depressive symptoms accounted for 60% of psychological frailty compared to physiological and social frailty.[21] The study by Chen & Chang reported that anxiety-related symptoms were associated with psychological frailty, but there were no associations with anxiety-related behavior.[20] Two studies (Verver and Zhang papers) reported a relationship between psychological frailty and quality of life, where quality of life was negatively associated with higher psychological frailty.[22,23] The Wang study found a negative association between stress control and overall individual lifestyles within the domain of psychological frailty.[21] The Donate-Martinez study found a significant association between psychological frailty and adverse mental health outcomes.[18] The significance of these outcomes is that psychological frailty consistently co-occurred with poorer mental health status. In clinical terms, a negative impact refers to higher levels of depressive or anxiety symptoms, or reduced quality of life; while a positive impact indicates lower psychological distress or better function. Across all included studies, associations were predominantly

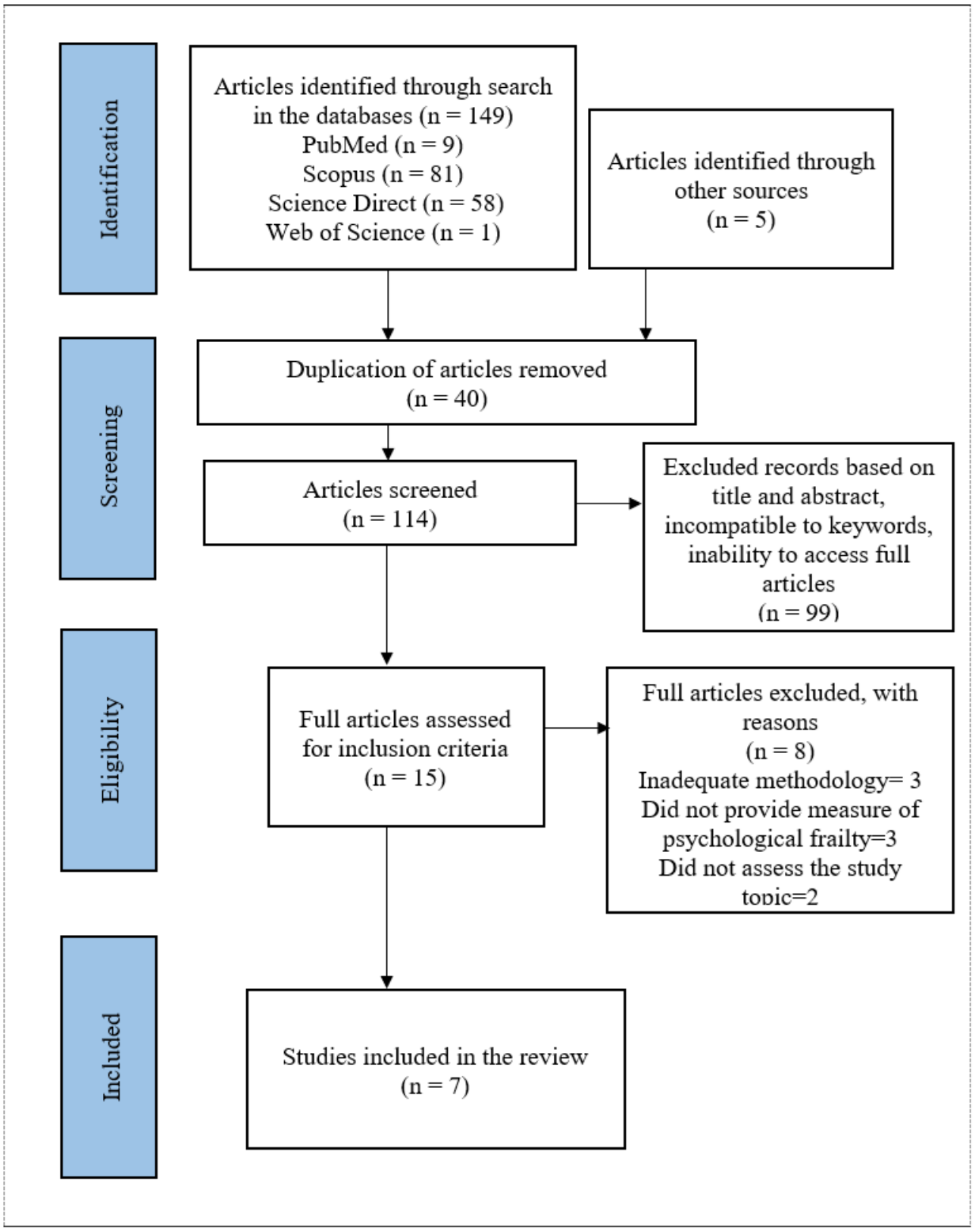

Figure 1. PRISMA flow diagram of the different phases of literature search and selection of studies.

Table 2: Characteristics of the reviewed studies included in the scoping review.

Authors	Year	Origin	Aims	Methodology	Outcome Measures	Important Results
Faria et al [17]	2022	Portugal	Analyze association between sociodemographic, clinical, and lifestyle factors of older adults with multi-dimensional frailty	Cross-sectional study	Tilburg Frailty Indicator (TFI) Individual Lifestyle profile (ILP), Sociodemographic, Clinical data	• Negative associations were found in individual lifestyle domain, stress control within psychological frailty domain. • Overall individual lifestyle was negatively associated with psychological frailty. • Positive associations were found between psychological frailty and number of chronic illnesses.
Doñate-Martínez et al [18]	2022	Spain	Examine the predictive ability of TFI towards disability, fall risk, quality of life, use of healthcare resources	Cross sectional study with 6-months longitudinal follow-up	Tilburg Frailty Indicator (TFI) Groningen Activity Restriction Scale Falls efficacy Scale International SF-12v2 Jong-Gierveld loneliness scale	• At baseline and follow-up, psychological frailty was associated with disability, physical health, mental health, loneliness, falls, visits to general practitioners, and taking medications. • Psychological frailty was the highest predictor of mental health compared to social frailty and physical frailty at baseline and follow-up.
Bąk et al [19]	2021	Poland	Impact of frailty syndrome on quality of life of patients with type 2 Diabetes	Cross-sectional study	Tilburg Frailty Indicator Beck Depression Inventory Audit of Diabetes-Dependent Quality of Life (ADDQoL)	• Frail diabetic patients had higher levels of depressive symptoms compared to non-frail diabetic patients. • Higher levels of psychological frailty was related to greater depressive symptoms. • Patients with frailty syndrome irrespective of domains had lower quality of life compared to non-frail patients.
Chen& Chang [20]	2023	Taiwan	Exploration of coronavirus-related anxiety and other factors influencing, psychological, social and physical frailty	Cross-sectional study	Coronavirus Pandemic Anxiety Scale Study of Osteoporotic Fracture (SOF) Tilburg Frailty Indicator Sociodemographic, Questionnaire to define the Social Frailty Status (QSFS) Item objective congruence	• Anxiety-related symptoms were associated with physical and psychological frailty. • There were no associations between psychological frailty and anxiety-related behaviour.
Wang et al [21]	2021	China	Assessed the levels of frailty and exploring their associated risk factors	Cross-sectional study	Tilburg Frailty Indicator Geriatric Depression Scale Mini-mental state examination Athens Insomnia Scale Activities of Daily Living (KATZ-15)	• After controlling for covariates, depressive symptoms accounted for 60% of the variability in psychological frailty compared to physical and social frailty. • Psychological frailty was significantly affected by depressive symptoms, cognition and grip strength.
Verver et al [22]	2019	Netherlands	Examine the relationship between different domains of frailty and health outcomes, wellbeing aspects	Cross-sectional study	Quality of life, Loneliness, Tilburg Frailty Indicator(TFI), Health perception, Number of conditions, Activities of Daily Living (KATZ15)	• Quality of life was the highest for non-frail compared to frail patients. • Higher loneliness scores were associated with overall frailty followed by psychological frailty, social frailty and physical frailty. • Non-frail compared to physical-psychological frail patients had higher Activities of Daily living scores.
Zhang et al [23]	2019	Netherlands (UHCE project)	Evaluate association between physical, psychological and social frailty with Health Related Quality of Life	Cross-sectional study	Tilburg Frailty Indicator Health Related Quality of Life SF-12	• Psychological frailty had the strongest association with the mental aspects of HRQoL. • Psychological frailty did not contribute to explaining physical aspects of HRQoL.

negative. Taken together, these findings suggest that psychological frailty is closely intertwined with mood symptoms and well-being, although causality remains unclear due to predominantly cross-sectional designs.

DISCUSSION

The objective of this scoping review was to explore the impact of psychological frailty on mental health and psychological outcomes, and evaluate current methods of assessing psychological frailty. The findings provide an overview of how psychological frailty is currently conceptualised and measured, and how it relates to key mental health outcomes in older adults.

Measures of Psychological Frailty: All studies employed the TFI to assess psychological frailty. The TFI primarily emphasises the evaluation of psychological frailty, offering an overview of mental well-being within the framework of frailty. Although the TFI includes a psychological domain and demonstrates moderate internal consistency,[17-19,21,22], it was originally designed as a multidimensional frailty tool including physical, psychological and social domains, rather than provide an in-depth measure of the complexities of psychological frailty. The psychological component of the TFI consists of only a few items assessing mood, anxiety and coping, potentially limiting the breadth and sensitivity of the construct it aims to measure. There were no alternative psychological frailty instruments identified in the included studies, reflecting the limited availability of tools specifically designed for this construct. Furthermore, no study evaluated test-retest reliability or provided evidence of construct validity of the psychological domain within their specific populations. This reflects a broader gap in the literature, as psychological frailty remains less clearly operationalized compared to physical frailty. Translations of the TFI were essential for non-English speaking populations. This raises concerns about cultural equivalence and conceptual validity; cultural differences may influence how psychological frailty is perceived and reported, which impacts the reliability and validity of the TFI across different settings. In this review, only two studies were conducted using translated versions,[19,21] with the other studies being Europe-based. This geographic concentration limits the generalisability of findings and highlights the need for culturally adapted tools and validation work in diverse settings. Thus, it is strongly recommended that cross-cultural studies be conducted to enhance the reliability and validity of the TFI.

Psychological Frailty and Adverse Mental Health Outcomes

The key adverse mental health outcomes identified in this review were depressive symptoms, anxiety, and poor health-related quality of life. These negative outcomes were associated with psychological frailty, although evidence of causality were limited. To the best of our knowledge, this is the first scoping review to investigate the relationship between psychological frailty and adverse mental health outcomes. Psychological frailty may be a precursor to significant psychological conditions, such as depression,[24,25] anxiety,[26,27] and cognitive decline. Individuals with reduced psychological resilience manifested as feelings of helplessness, loss of interest in life, and reduced emotional well-being are particularly vulnerable to developing mental health disorders.[28] These findings reinforce the potential role of psychological frailty as an early indicator of mental health vulnerability, rather than a late consequence of disease. Thus, identifying psychological frailty is an opportunity for surveillance and proactive management to prevent the onset of mental health conditions and the associated long-term outcomes.

One study identified psychological frailty as a primary predictor of poor mental health outcomes, surpassing the influence of social and physical frailty at baseline and follow-up assessments.[23] Another review noted that depressed patients may not always present with a low mood; rather indicators such as loss of interest or meaningful engagement in life may be more prominent and should be actively assessed.[29]

Historically, research has emphasised the impact of physical frailty on adverse health outcomes.[27] However, there is a growing body of literature emphasising the role of psychological frailty in shaping mental health trajectories among older adults. Critics of the biomedical model, such as Levers and Shaw [30,31] emphasised the limitations of focusing solely on physical health, due to the risk of overlooking psychological and social dimensions of frailty, which may lead to fragmented care.

Psychological frailty has also been shown to have a negative association with health-related quality of life.[22,23] This association underscores the role of psychological resilience, coping ability, and emotional regulation in determining well-being. Self-efficacy, particularly in health contexts, has also been identified as a significant mediator of health behaviours and outcomes. Individuals with higher self-efficacy are more likely to engage in health-promoting practices, such as exercise, which in turn supports better mental health

and quality of life.[32-36] These psychosocial mechanisms may partially explain why psychological frailty contributes to poorer outcomes independent of physical frailty.

In summary, psychological frailty appears to be an important determinant of mental health and psychological outcomes in older adults. Further research is warranted to explore whether targeted interventions can influence domains of psychological frailty and improve psychological well-being in this population.

LIMITATIONS AND RECOMMENDATIONS

This review has several limitations. Firstly, the search was limited to studies published between 2019 to 2023. While this time frame was selected due to the increasing recognition of psychological frailty during this period, it may have excluded earlier foundational work on the concept. Secondly, most of the included studies employed cross-sectional design, with only one using a short-term longitudinal approach. While cross-sectional data may demonstrate associations, they do not establish temporal or causal relationships. Future studies should consider a longitudinal design to clarify the development and trajectory of psychological frailty and its effects on mental health outcomes. Finally, the emerging nature of psychological frailty as a construct resulted in a small body of literature focused specifically on its relationship with mental health, which limited the depth of the findings.

Despite this, the studies included support the utility of the Tilburg Frailty Indicator, which was shown to have good reliability and validity in diverse populations. However, the exclusive reliance of the TFI across all included studies limits insight into how other psychological frailty instruments perform, and no study evaluated test-retest reliability or conducted population-specific validation of the psychological domain.

The geographical concentration of studies, largely in Europe and China, also limits generalisability, as psychological constructs may vary culturally. Further work is therefore needed to adapt and validate psychological frailty measures across different cultural contexts. Additionally, the restriction to English-language publications may have introduced language or publication bias.

Future research should consider cultural adaptations of psychological frailty measures and explore intervention strategies to improve resilience and reduce the risk of adverse mental health outcomes in older adults.

CONCLUSION

This scoping review highlights psychological frailty as an emerging but significant risk factor for adverse mental health outcomes in older adults. Interventions to reduce psychological frailty may improve mental health and overall well-being in this population. Further research is needed to better understand the mechanisms linking psychological frailty and mental health, and develop targeted strategies for prevention and management. Strengthening conceptual clarity, improving measurement validity, and incorporating culturally sensitive tools will be essential steps in advancing this field. Integrating psychological frailty assessment into routine geriatric practice may support earlier identification of at-risk individuals and guide targeted interventions aimed at promoting healthy ageing.

Take Home Message

- Psychological frailty is an important domain of frailty linked to mental health risk.
- Psychological frailty was consistently associated with depression, anxiety, and reduced quality of life.
- All included studies used the Tilburg Frailty Indicator's psychological domain for assessment.
- Future research should assess the validity and cultural relevance of existing psychological frailty measures in different settings.
- Early identification of psychological frailty may support targeted interventions to prevent mental health decline in older adults.

Abbreviations

TFI	Tilburg Frailty Indicator
LMIC	Low– and middle-income countries
PRISMA	Preferred Reporting Items for Systematic reviews and Meta-Analyses
PCC	Population, concept, and context
ILP	Individual lifestyle profile
KATZ15	Activities of daily living
SOF	Study of osteoporotic fracture

Declarations

Ethical Declaration

As this study was a scoping review of existing literature with no human participants involved, it was exempt from ethical review and institutional board approval.

Disclosure and Conflict of Interest

The authors declare no conflicts of interest, and no external funding was received for this study.

Author Contributions:

Conceptualisation: AZMD, PS; **Data curation**: AZMD; **Formal analysis**: AZMD, PS; **Investigation**: AZMD, PS; **Methodology**: AZMD; **Supervision**: PS, NFMR, SPT, MA; **Writing original draft:** AZMD; **Writing review and editing:** PS, NFMR, SPT, MA.

References

1. World Health Organisation. Ageing. [Internet]. Available from: https://www.who.int/health-topics/ageing#tab=tab_1 [Accessed 2025 January 19]
2. World Health Organisation. Ageing and health. [Internet]. Available from: https://www.who.int/news-room/fact-sheets/detail/ageing-and-health [Accessed 2025 January 19]
3. 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(3). doi:10.1093/GERONA/56.3.M146
4. Gobbens RJJ, Luijkx Katrien G. KG, Wijnen-Sponselee MT, Schols JMGA. In search of an integral conceptual definition of frailty: opinions of experts. *J Am Med Dir Assoc*. 2010;11(5):338-343. doi:10.1016/J.JAMDA.2009.09.015
5. Clegg A, Young J, Iliffe S, Rikkert MO, Rockwood K. Frailty in elderly people. *Lancet*. 2013;381(9868):752-762. doi:10.1016/S0140-6736(12)62167-9
6. Rodríguez-Mañas L, Féart C, Mann G, Vina J, Chatterji S, Chodzko-Zajko W, et al. Searching for an operational definition of frailty: a Delphi method based consensus statement: the frailty operative definition-consensus conference project. *J Gerontol A Biol Sci Med Sci*. 2013;68(1):62-67. doi:10.1093/GERONA/GLS119
7. Lin H, Xiao S, Shi L, Zheng X, Sue Y, Yun Q, et al. Impact of multimorbidity on symptoms of depression, anxiety, and stress in older adults: is there a sex difference? *Front Psychol*. 2021;12:762310. doi:10.3389/FPSYG.2021.762310/BIBTEX
8. De Witte N, De Donder L, Dury S, Buffel T. A theoretical perspective on the conceptualisation and usefulness of frailty and vulnerability measurements in community dwelling older persons. *Aporia*. 2013;5(1):13-31. https://research.manchester.ac.uk/en/publications/a-theoretical-perspective-on-the-conceptualisation-and-usefulness [Accessed 2025 January 8]
9. Hogan DB. Models, definitions, and criteria for frailty. *Conn's Handbook of Models for Human Aging*. Published online January 1, 2018:35-44. doi:10.1016/B978-0-12-811353-0.00003-8
10. Fitten LJ. Psychological frailty in the aging patient. *Nestle Nutr Inst Workshop Ser*. 2015;83:45-53. doi:10.1159/000382060
11. Hayashi T, Noguchi T, Kubo Y, Tomiyama N, Ochi A, Hayashi H. Social frailty and depressive symptoms during the COVID-19 pandemic among older adults in Japan: Role of home exercise habits. *Arch Gerontol Geriatr*. 2022;98. doi:10.1016/J.ARCHGER.2021.104555
12. Qi X, Li J. The relationship between social frailty and depressive symptoms in the elderly: a scoping review. *Int J Environ Res Public Health*. 2022;19(24). doi:10.3390/IJERPH192416683
13. Shin J, Kim M, Choi J. Development and validation of a multidimensional frailty scale for clinical geriatric assessment. *J Nutr Health Aging*. 2021;25(7):938-943. doi:10.1007/S12603-021-1652-0
14. Arksey H, O'Malley L. Scoping studies: towards a methodological framework. *Int J Soc Res Methodol*. 2005;8(1):19-32. doi:10.1080/1364557032000119616
15. Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun N, Levac D, et al. PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Ann Intern Med*. 2018;169(7):467-473. doi:10.7326/M18-0850
16. Peters M, Godfrey C, McInerney P, Soares CB, Khalil H, Parker D. Methodology for jbi scoping reviews. Published online 2015:3-24. [Accessed 2025 January 19] https://research.monash.edu/en/publications/methodology-for-jbi-scoping-reviews
17. Faria ACA, Martins MMFPS, Ribeiro OMPL, Ventura-Silva JMA, Fonseca EF, Ferreira LJM, et al. Multidimensional frailty and lifestyles of community-dwelling older Portuguese adults. *Int J Environ Res Public Health*. 2022;19(22). doi:10.3390/IJERPH192214723
18. Doñate-Martínez A, Alhambra-Borrás T, Durá-Ferrandis E. Frailty as a predictor of adverse outcomes among Spanish community-dwelling older adults. *Int J Environ Res Public Health*. 2022;19(19). doi:10.3390/IJERPH191912756
19. Bąk E, Młynarska A, Marcisz C, Bobiński R, Sternal D, Młynarski R. The influence of frailty syndrome on quality of life in elderly patients with type 2 diabetes. *Qual Life Res*. 2021;30(9):2487-2495. doi:10.1007/s11136-021-02829-x
20. Chen IC, Chang SH. The relationship between coronavirus-related anxiety on physical frailty, psychological frailty, and social frailty in older community-dwellers in Taiwan during the COVID-19 pandemic. *J Health Res*. 2023;37(3):253-260. doi:10.56808/2586-940X.1041
21. Wang H, Wang J, Xie B, Liu B, Wang J. Multi-dimensional frailty and its risk factors among older residents in long-term care facilities in Shanghai, China. *Int J Nurs Sci*. 2021;8(3):298-303. doi:10.1016/J.IJNSS.2021.06.003
22. 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(1):1-12. doi:10.1186/S12877-019-1077-3/TABLES/3
23. Zhang X, Tan SS, Franse CB, Alhambra-Borras T, Dura-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(5):936-942. doi:10.1093/EURPUB/CKZ099
24. Lohman MC, Mezuk B, Dumenci L. Depression and frailty: concurrent risks for adverse health outcomes. *Aging Ment Health*. 2017;21(4):399-408. doi:10.1080/13607863.2015.1102199
25. Soysal P, Veronese N, Thompson T, Kahl KG, Fernandes BS, Prina AM, et al. Relationship between depression and frailty in older adults: A systematic review and meta-analysis. *Ageing Res Rev*. 2017;36:78-87. doi:10.1016/J.ARR.2017.03.005
26. Chang HY, Fang HL, Ting TT, Liang J, Chuang SY, Hsu CC, et al. The co-occurrence of frailty (accumulation of functional deficits) and depressive symptoms, and its effect on mortality in older adults: a longitudinal study. *Clin Interv Aging*. 2019;14:1671-1680. doi:10.2147/CIA.S210072
27. Collard RM, Arts MHL, Schene AH, Naarding P, Oude Voshaar RC, Comijs HC. The impact of frailty on depressive disorder in later life: Findings from the Netherlands Study of depression in older persons. *Eur Psychiatry*. 2017;43:66-72. doi:10.1016/J.EURPSY.2017.01.003
28. Tetsuka S. Depression and dementia in older adults: a neuropsychological review. *Aging Dis*. 2021;12(8):1920. doi:10.14336/AD.2021.0526
29. Gobbens RJJ, van Assen MALM, Luijkx KG, Wijnen-Sponselee MT, Schols JMGA. The Tilburg Frailty Indicator: psychometric properties. *J Am Med Dir Assoc*. 2010;11(5):344-355. doi:10.1016/J.JAMDA.2009.11.003
30. Levers MJ, Estabrooks CA, Ross Kerr JC. Factors contributing to frailty: literature review. *J Adv Nurs*. 2006;56(3):282-291. doi:10.1111/J.1365-2648.2006.04021.X
31. Shaw RL, Gwyther H, Holland C, Bujnowska-Fedak M, Kurpas D, Cano A, et al. Understanding frailty: meanings and beliefs about screening and prevention across key stakeholder groups in Europe. *Ageing Soc*. 2018;38(6):1223-1252. doi:10.1017/S0144686X17000745
32. Heslin PA, Klehe UC. Self-Efficacy. Published online September 22, 2006. Available from: https://papers.ssrn.com/abstract=1150858 [Accessed 2025 January 19]
33. Tang MY, Smith DM, Mc Sharry J, Hann M, French DP. Behavior change techniques associated with changes in postintervention and maintained changes in self-efficacy for physical activity: a systematic review with meta-analysis. *Ann Behav Med*. 2019;53(9):801-815. doi:10.1093/ABM/KAY090
34. Hao W, Li J, Fu P, Zhao D, Jing Z, Wang Y, et al. Physical frailty and health-related quality of life among Chinese rural older adults: a moderated mediation analysis of physical

disability and physical activity. *BMJ Open*. 2021;11(1):42496. doi:10.1136/BMJOPEN-2020-042496

35. Mudrak J, Stochl J, Slepicka P, Elavsky S. Physical activity, self-efficacy, and quality of life in older Czech adults. *Eur J Ageing*. 2015;13(1):5-14. doi:10.1007/S10433-015-0352-1
36. Domènech-Abella J, Mundó J, Haro JM, Rubio-Valera M. Anxiety, depression, loneliness and social network in the elderly: Longitudinal associations from The Irish Longitudinal Study on Ageing (TILDA). *J Affect Disord*. 2019;246:82-88. doi:10.1016/J.JAD.2018.12.043