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Applications of the PRECEDE–PROCEED Model in Older Adults' Mental Health: An Exploratory Bibliographic Map

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ABSTRACT

The PRECEDE–PROCEED model (PPM) is an ecological framework for planning and evaluating health promotion programs. This study aimed to create an exploratory bibliographic map of PPM applications in older adults' mental health. Nine search queries covered the model's name, older-adult terms, and mental-health outcome terms Searches were conducted in Scopus and Web of Science Core Collection on October 31, 2023. After deduplication, 200 records were retrieved, and abstract screening retained 16 as potentially relevant; 10 are described here. The remaining six records were excluded after full-text assessment because they did not explicitly apply the PPM (n=3), focused on populations under 60 years (n=2), or were duplicate conference abstracts of studies already included as full-text articles (n=1). These are workflow counts, not database-wide estimates. Records were grouped by outcome focus, study design, and possible cohort overlap. Direct mental-health outcomes were present but sparse. A quasi-experimental study in Tehran (n = 94) reported significantly lower stress scores on the DASS-21 two months after a PRECEDE-based education program ($P \leqslant 0.001$). A cross-sectional study in Surakarta, Indonesia, applied the PRECEDE–PROCEED framework to depressive symptoms: strong family support (b = −8.67; 95% CI −11.38 to −5.97; $P < 0.001$) and peer support (b = −2.79; 95% CI −5.01 to −0.56; $P = 0.014$) were associated with lower scores. Quality-of-life studies formed adjacent, non-interchangeable evidence. Several records may report overlapping cohorts, so the 10 records may represent as few as six independent studies. The retrieved records support an exploratory map covering older adults' stress education, depression-related factors, and general quality of life. They do not support estimates of global output, citation impact, co-authorship, or keyword networks. A full bibliometric study requires a defined database search, a complete metadata export, and duplicate-aware screening.

Keywords: PRECEDE–PROCEED; older adults; mental health; exploratory bibliographic map; health promotion

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Introduction

Mental disorders impose substantial disability. In the Global Burden of Disease Study 2019, they accounted for 14.6% of global years lived with disability, and the burden of depressive and anxiety disorders continues into older ages (GBD 2019 Mental Disorders Collaborators, 2022).

The PPM organizes intervention development around population needs, behavioral and environmental determinants, and predisposing, reinforcing, and enabling factors (Crosby & Noar, 2011; Green & Kreuter, 2005). It is a planning framework rather than a single treatment or behavior-change theory, and it encourages planners to work backward from desired outcomes.

A systematic review of 26 intervention studies found that PPM-based programs have been applied across many populations and settings, and its meta-analysis of 11 studies reported significant improvement in knowledge, which was its pooled outcome (Kim et al., 2022). That review also noted that several studies used only the PRECEDE phase. To our knowledge, the use of the PPM in older adults' mental health has not been mapped separately as confirmed by our preliminary scoping search described in the Methods section, which yielded no prior dedicated bibliometric or scoping reviews on this specific intersection.

This study aimed to create an exploratory bibliographic map of PPM applications in older adults' mental health, describing retrieved records by outcome focus, study design, setting, and publication year, and identifying evidence gaps.

2. Methods

2.1 Scope and search strategy

The scope covered PRECEDE or PRECEDE–PROCEED, older adults defined in this study as individuals aged 60 years and older, aligning with WHO and most included records, and mental-health or adjacent psychosocial outcomes. General quality-of-life studies were classified separately from direct psychiatric outcomes. Nine queries covering the model name, older-adult terms, and mental-health terms were run in Scopus and Web of Science Core Collection on October 31, 2023; the query strings are listed in Supplementary Table S1. Deduplication yielded 200 records, and abstract screening retained 16. These counts describe the workflow and are not database-wide estimates.

2.2 Screening

Two independent reviewers screened the titles and abstracts. Deduplication was performed using EndNote software. Any disagreements regarding inclusion were resolved through discussion or consultation with a third senior reviewer.

2.3 Data grouping and analysis

Records were grouped by outcome focus (direct mental-health outcome, disease-specific outcome with a mental-health component, or general quality of life), study design, and setting. Records sharing sample size, setting, intervention structure, and outcome measure were flagged as possibly overlapping and were not counted as independent studies without full-text comparison. Values were extracted from abstracts or records and were not verified against full texts. The available metadata lacked cited-reference, affiliation, and complete keyword fields, so citation, co-authorship, and co-word analyses were not performed. No risk-of-bias assessment was conducted.

3. Results

3.1 Records

Of 200 unique records, 16 were retained after abstract screening, and 10 are described below (Table 1; Figures 1–3).

3.2 Direct mental-health outcomes

Stress. In a quasi-experimental study, 94 older adults from elderly clubs in Tehran were randomly allocated to intervention and control groups in 2008–2009. The intervention comprised eight weekly sessions, and the DASS-21 was administered at baseline and two months later. Stress scores were significantly lower in the intervention group ($P \leq 0.001$; Sharifirad et al., 2013). An earlier record (Ghaffari et al., 2011) has the same sample size, setting, and outcome measure, and may describe the same cohort. It should not be counted as independent without full-text comparison.

Depression symptoms. A cross-sectional path analysis conducted in Surakarta in September–October 2019 examined determinants of depressive symptoms in 200 older adults (Tunurrohmin et al., 2019). Strong family support ($b = -8.67$; 95% CI −11.38 to −5.97; $P < 0.001$) and strong peer support ($b = -2.79$; 95% CI −5.01 to −0.56; $P = 0.014$) were associated with lower scores, whereas being unpartnered ($b = 8.42$; 95% CI 5.75 to 11.10; $P < 0.001$) and female sex ($b = 4.83$) were associated with higher scores. A related conference record using multiple linear regression reported different estimates, including higher scores with nursing-home residence ($b = 8.16$; 95% CI 5.26 to 11.06; $P < 0.001$), family support ($b = -5.02$), and peer support ($b = -2.75$) (Tunurrohmin, 2020). The two records should be reported separately rather than pooled. This work applies the model analytically and is not an intervention trial.

Disease-specific depression. In older adults with chronic heart failure, a PRECEDE-based education program (nine weekly sessions) was compared with a control group, with follow-up at three months (Wang et al., 2017). The authors reported significant decreases in PHQ-9 and in the Minnesota Living with Heart Failure Questionnaire score in the intervention group, and differences from control. They described the result as a trend, and the trial was registered retrospectively. The study is relevant to mental health but embedded in disease-specific self-care education. The affiliation of the authors indicates a Chinese setting (Second Xiangya Hospital).

3.3 Quality of life as adjacent evidence

In a randomized experimental study of 80 older adults, the mean quality-of-life score rose from 76.77 ± 13.23 to 82.87 ± 12.25, and total scores differed significantly between groups ($P = 0.031$; Doshmangir et al., 2014). The authors also reported significant before–after differences in physical, mental, environmental, and social

dimensions. A semi-experimental study of 128 adults aged over 60 in Zahedan reported a rise in mean quality-of-life score from 47.72 to 58.90 only in the intervention group; its abstract does not isolate a psychiatric outcome (Mazloomymahmoodabad et al., 2014). Three records on a Tehran cultural-center cohort (Afkari et al., 2011; Matin et al., 2013; Matin et al., 2014) report quality-of-life education, and several appear to share a 54-person 2009 cohort, which must be checked before they are treated as separate studies.

3.4 Setting, design, and overlap

Of 10 records, six were from Iran (Tehran and Zahedan), two from Indonesia, one from China, and one had no stated setting (Figure 2a). If all flagged overlaps are confirmed, the records correspond to at least six independent studies (Figure 2b). The records comprise intervention studies and cross-sectional analyses (Figure 3). Outcomes range from stress and depression to general quality of life, and the evidence cannot be treated as one intervention-effect base.

Table 1

Evidence Clusters in the Retrieved Records

Cluster	Records	Design	Interpretation
Stress/distress	Ghaffari 2011; Sharifirad 2013	Quasi-experimental (DASS-21)	Most direct intervention signal; possible duplicate records
Depression symptoms	Tunurrohmin 2019; 2020	Cross-sectional	Determinants, not intervention effect; two analyses differ
Disease-specific depression	Wang 2017	Controlled intervention (PHQ-9)	Mental-health outcome embedded in heart-failure care
General quality of life	Afkari 2011; Matin 2013, 2014; Doshmangir 2014; Mazloomymahmoodabad 2014	Intervention studies	Adjacent evidence; overlapping cohort possible

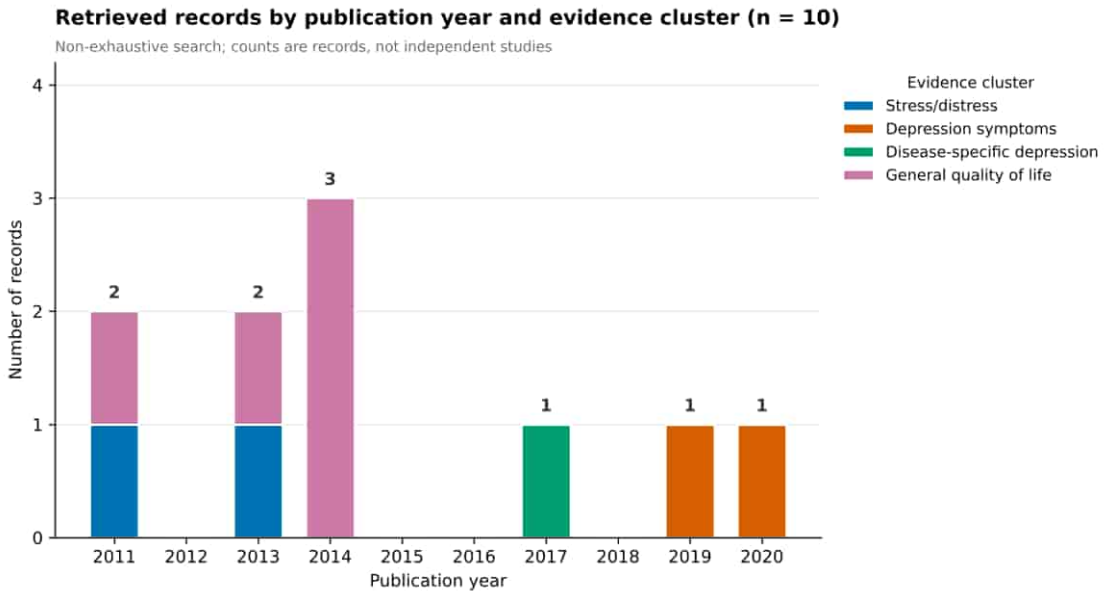


Figure 1. Retrieved records by publication year and evidence cluster (n = 10). The search was non-exhaustive, and counts are records, not independent studies.

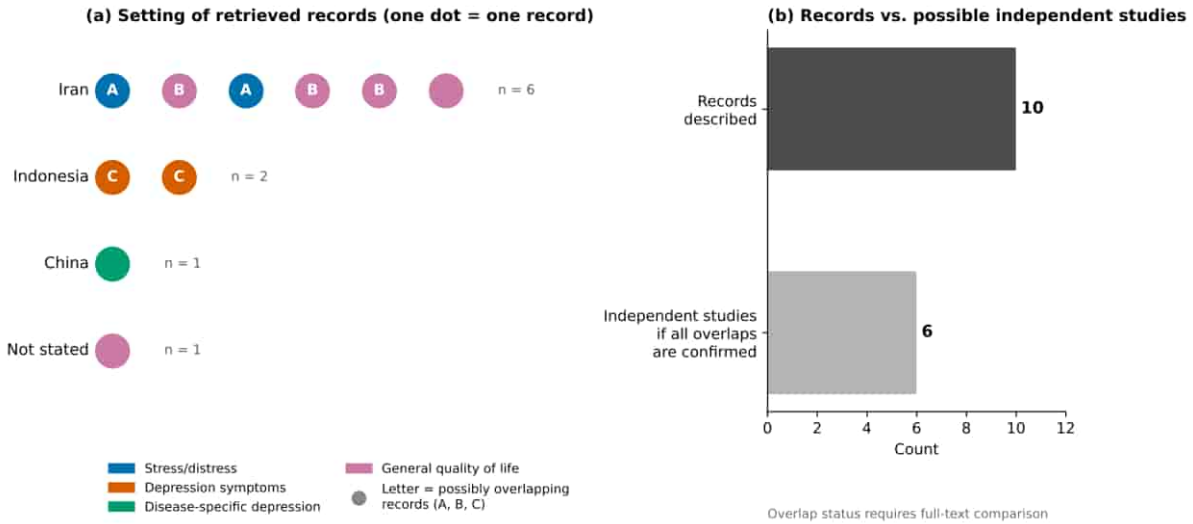


Figure 2. (a) Setting of retrieved records; letters mark possibly overlapping records (A: Tehran stress records; B: Tehran cultural-center records; C: Surakarta records). (b) Records versus the minimum number of independent studies if all overlaps are confirmed.

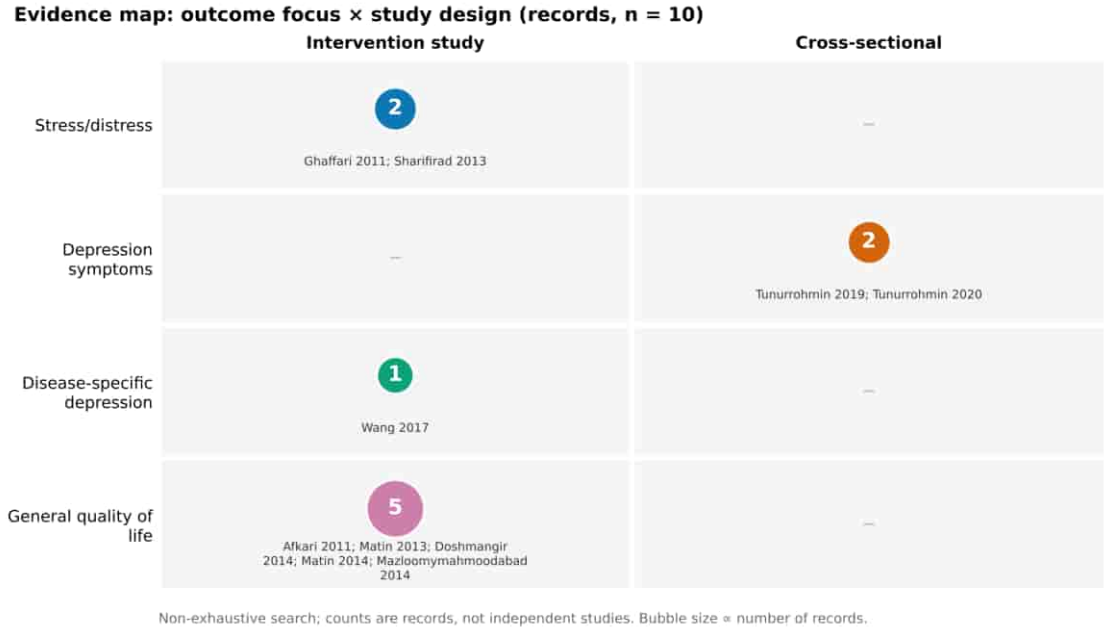


Figure 3. Evidence map of outcome focus by study design (n = 10 records).

4. Discussion

The retrieved records support an exploratory map of stress education, depression-related factors, and general quality-of-life interventions for older adults. They do not support claims about global publication output, citation impact, co-authorship, or keyword networks.

The records show that the PPM has been applied in several older-adult settings, but they do not show that the framework produces better outcomes than equally intensive programs planned another way. Several studies used uncontrolled or pre–post designs, self-report measures, and short follow-up. Many records describe PRECEDE-based education, and a previous review has noted that some studies apply only the PRECEDE phase (Kim et al., 2022), so the full PROCEED phase may be under-represented. Concentration in Iran and Indonesia may reflect search coverage rather than true research activity, and it does not indicate a broad international network.

Limitations. (1) The search was non-exhaustive, and the platform, dates, and query strings need full documentation. (2) Screening used abstracts, and values were taken from abstracts or records without full-text verification. (3) Possible overlap among the Tehran stress records, the Tehran cultural-center records, and the Surakarta records requires full-text comparison. (4) Designs and outcomes are heterogeneous. (5) No quality or risk-of-bias appraisal was performed. (6) Affiliation and cited-reference metadata were

incomplete, so no bibliometric network analysis was possible. (7) The search was limited to English-language publications, which may have excluded relevant studies published in Persian, Indonesian, or other regional languages, potentially introducing language bias.

5. Conclusion

The retrieved literature supports an exploratory map of PRECEDE–PROCEED applications in older adults' mental health, with stress education in Tehran (Sharifirad et al., 2013), depression-factor analysis in Surakarta (Tunurrohmin et al., 2019), a controlled heart-failure education study (Wang et al., 2017), and quality-of-life interventions in Iran. It does not support global mapping claims. Future work should use a documented systematic search with a complete metadata export and duplicate-aware screening.

Declarations

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Conflict of Interest: The authors declare that they have no competing interests.

Authors' Contributions: Dorren G. Candow: Conceptualization, Methodology, Writing – Original Draft and Formal Analysis, Visualization, Supervision.

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