

Prevalence and Risk Factors for Frailty among Community-Dwelling Older Adults in India: A Systematic Review and Meta-Analysis

INPLASY2023100064

doi: 10.37766/inplasy2023.10.0064

Received: 19 October 2023

Published: 19 October 2023

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ADMINISTRATIVE INFORMATION

Support - Not Applicable.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY2023100064

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 19 October 2023 and was last updated on 19 October 2023.

INTRODUCTION

Review question / Objective This study aimed to synthesize frailty prevalence among community-dwelling older adults in India and identify factors that influence the prevalence of frailty.

Rationale To date only a limited number of studies have focused on frailty in Indian community-dwelling older adults, and the prevalence and risk factors identified differ substantially among these published studies. Little effort has been made to conduct a systematic review of both frailty prevalence and associated risk factors in the older adults in India. To the best of our knowledge, the present study is the first to conduct a comprehensive systematic review and meta-analysis of this research area, making it of great significance for disease prevention.

Condition being studied The proportion of older adults is expanding rapidly on a global scale.

According to the Census Report for 2011, there are 10.38 crore senior citizens in the country, or 8.6% of the overall population, with a predicted growth to 13.1% in 2031. The expanding cohort of individuals aged 60 to 80 is a demographic of increasing significance, possessing the potential to contribute as valuable societal constituents, transcending the conventional perception of being a collective burden. It is crucial to recognize that the prevalence of frailty exerts a notable influence on national productivity, thereby amplifying societal burdens.

METHODS

Search strategy Database

1: Pubmed
 (((("Frailty"[Mesh] OR "Frail Elderly"[Mesh] OR frailty* OR frail* OR frailty syndrome* OR frail elderly OR frailty index OR asthenia OR frail elderly* OR aging)) AND ("Prevalence"[Mesh] OR "Risk Factors"[Mesh] OR "Epidemiology"[Mesh] OR "Cross-sectional Studies"[Mesh] OR

prevalence* OR risk factor* OR determinant* OR predictor* OR incidence* OR morbidity OR cross sectional stud* OR cross sectional analys* OR cross sectional survey OR disease frequency survey* OR cross sectional research)) AND ("Aged"[Mesh] OR "Geriatrics"[Mesh] OR aged OR elderly OR geriatrics OR gerontology OR older adults OR aging)) AND ("Community Participation"[Mesh] OR "Independent Living"[Mesh] OR communit* OR community dwelling* OR domicile* OR community-based participatory research OR community participation OR community involvement*)) AND ("India"[Mesh] OR India OR Indian OR Indian population OR Indian state*))

Database 2: Pro-Quest

(((((frail* OR frailty syndrome* OR frail elderly OR frailty index OR asthenia OR frail elderly OR frailty)) AND (prevalence* OR risk factor* OR determinant* OR predictor* OR incidence* OR morbidity OR cross sectional stud* OR cross sectional analys* OR cross sectional survey OR disease frequency survey*)) AND (aged OR elderly OR geriatrics OR gerontology OR older adults OR aging)) AND (communit* OR community dwelling* OR domicile* OR community-based participatory research OR community participation OR community involvement*)) AND (India OR Indian state* OR Indian OR Indian population)).

Database 3: Web of Science

#1 All=(frail* OR frailty syndrome* OR frail elderly OR frailty index OR asthenia OR frail elderly)

#2 All=(prevalence* OR risk factor* OR determinant* OR predictor* OR epidemiology OR incidence* OR morbidity OR cross sectional stud* OR cross sectional analys* OR cross sectional survey OR disease frequency survey*)

#3 All=(aged OR elderly OR geriatrics OR gerontology OR older adults OR aging)

#4 All=(communit* OR community dwelling* OR domicile* OR community-based participatory research OR community participation OR community involvement*)

#5 All=(India OR Indian state* OR Indian OR Indian population)

#6 (#5 AND #4 AND #3 AND #2 AND #1).

Participant or population Community-dwelling adults aged 60 years and older lived in India.

Intervention Not Applicable.

Comparator Not Applicable.

Study designs to be included Design: The systematic literature review and meta-analysis conducted using articles available in three electronic databases including PubMed, Web of

Science, and ProQuest. Setting: Cross-sectional and national longitudinal population-based cohort studies from Indian community were selected.

Eligibility criteria The inclusion criteria were as follows: (1) English language per-reviewed articles, available in full text, with human studies; (2) published from Jan 2000 to 2023; (3) country of study is India; (4) prevalence studies, cross-sectional studies, cohort studies, observational studies, surveys; (5) prevalence of frailty reported as the primary outcome of the study, exact frailty diagnostic criteria were available, frailty measured by any assessment method; (6) Studies focussed on older adults (≥ 60 years); (7) in such cases where a study assessed the prevalence of frailty by two or more different scales, we leaned towards the prevalence assessed by physical frailty. The exclusion criteria were as follows: (1) Editorials, commentaries, review papers, correspondence, abstract-only publications, conference proceedings, conference abstracts, personal opinions, randomized controlled trial studies; (2) studies before 2000 were rejected; (3) older adults with severe diseases or conditions; (4) participants who were hospitalized, institutionalized, or nursing home residents (5) studies with incomplete data or sample size is less than 50.

Information sources Electronic Databases: PubMed, ProQuest, and Web of Science.

Main outcome(s) The pooled prevalence rate of frailty was 33.8% (95% CI= 26.7% to 40.8%). The estimated frailty prevalence was 32.6% (95%CI= 24.7% to 41.5%) while assessed by the Fried frailty phenotype, 47.2% (95%CI= 43.8% to 50.7%) by the Edmonton frailty index, 32.2% (95CI= 24.3% to 41.3%) by the Tilburg frailty indicator, and 31.1% (24.8% to 37.9%) by Women's Health and Ageing Studies (WHAS) frailty criteria ($p < 0.01$). Subgroup analysis in the included studies found that frailty prevalence was increased with older age ($p = 0.01$) and was higher in those who were not in union (45.2%) than in married respondents (29.3%) ($p < 0.01$).

Quality assessment / Risk of bias analysis The quality of each study was assessed and then verified by the author using Joanna Briggs Institute's Critical Appraisal Checklist for the prevalence studies. The reviewer scored 1 for "Yes" and 0 for "No" or "Unclear". This checklist addresses critical issues, including representative sample, participant recruitment, sample size, study subjects, and setting, data coverage of the identified sample, measurement of the condition, statistical analysis, and the identification of

confounding factors/ subgroups. A study is deemed to have "adequate quality" if it satisfies more than five out of the nine specified criteria, making it eligible for inclusion as a potential study in this systematic review.

Strategy of data synthesis A random-effect model using the DerSimonian-Laird method estimates with 95%CI was chosen to calculate the pooled prevalence of frailty because heterogeneity was anticipated. Statistical analysis was performed using the meta-package in RStudio version 2023.06.2 (Integrated Development for R. RStudio, PBC) and meta package in STATA version 17. To measure heterogeneity among studies, we used Cochran's Q-statistics and the Chi-square test, a p-value less than 0.05 was statistically significant. I-squared (I²) was to quantify the magnitude of inconsistency in effect sizes, in which 25%,50% and 75% were considered low, moderate, and high degrees of heterogeneity, respectively. Chi-squared tests were used to test for differences between subgroups, and a p-value less than 0.05 indicates it is statistically significant.

Subgroup analysis Subgroup analyses on the prevalence of frailty among older adults were carried out in this paper to determine probable heterogeneity sources and interpret the variability among studies in the systematic review. Subgroups are classified according to gender (male, female), age (60-69 years, 70-79 years, and >=80 years), marital status (in union, not in union), wealth status (poor, middle, rich), smoking status (no smoking, ever/current smoking), alcohol drinking (no drinking, ever/current smoking), experienced fall (yes, no), presence of chronic disease (yes, no), education level (illiterate, primary, secondary, and higher secondary & above), occupation (working, not working), region (Northern India, Western India, Eastern India, Southern India), and frailty assessment methods (Fried frailty phenotype (original and modified), Edmonton frailty index, Frailty index-40 items, Tilburg frailty indicator (TFI), and Women's Health and Ageing Studies (WHAS) frailty criteria.

Sensitivity analysis Outliers possess the potential to exert a genuine influence, as evidenced by the set of leave-one-out diagnostic tests. This test has been performed for sensitivity analysis of the included studies.

Language restriction English language.

Country(ies) involved India.

Keywords frailty; older adults; prevalence; community dwelling; systematic review; India.

Contributions of each author

Author 1 - Madhurima Sharma - Author 1 conceptualized the paper and drafted the manuscript. Some parts of data analysis done by the author 1.

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Author 2 - Abhishek Anand - The author provided statistical expertise and methodological guidance, paper drafting assistance.

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Author 3 - Aparajita Chattopadhyay - The author contributed to the development of the selection criteria, and guided on methodological bias assessment in the reviews process.

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