The Association of Frailty with Poverty in Older Adults: A Systematic Review

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Keywords

Frailty · Poverty · Older adults

Abstract

Introduction: Suffering from both frailty and poverty may have significant negative consequences on older adults' lives. This study aimed to conduct a systematic review to investigate the relationship between frailty and low income among older adults. **Methods:** This systematic review was guided by the PRISMA guidelines and was aimed at exploring the frailty in older adults with low income and evaluating the robustness of the synthesis. Cross-sectional and longitudinal studies published in English between 2008 and 2020 were identified using search terms entered into the following databases: CINAHL, Medline, Google Scholar, and PubMed. **Results:** Nine articles met the inclusion criteria. This review revealed a positive relationship between frailty and poverty. Such a relationship could be explained through 3 dimensions of the relationship between frailty and poverty among older adults identified based on the findings of the reviewed studies. **Discussion/Conclusion:** The social life, environmental conditions, and financial issues were positively correlated and coexisted with both frailty and poverty. Frailty should be treated on a holistic basis, considering financial issues. Among these financial issues is poverty, which disrupts older adults' social activities, hinders them from building successful social relationships, and reduces their quality of life.

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Introduction

The population of elders aged 60 years or over is expected to grow more rapidly than other age groups, which may be attributed to the increase in people's life expectancy from 61.7 years in 1980 to 71.8 years in 2015 [1] as a result of the improvement of healthcare [1, 2]. It has been reported that older adults comprise almost 13% of the global population, with the population of older adults growing at a 3% annual growth rate [2] and expected to increase to almost 2 billion by 2050 [3]. As a result, illnesses among the elderly are expected to increase, which will require comprehensive and coordinated healthcare facilities to increase the amount of healthcare they provide [4]. Several studies have suggested that frailty is a main health condition linked to aging, with the incidence of frailty among older adults found to range from 10% to 59.1% [5, 6].

Frailty refers to the decline in physiological reserve and places individuals at risk of experiencing stressors related to different domains, including social and environmental domains [7]. Suffering from frailty may have significant negative consequences on older adults' lives, including reduced quality of life. Frailty is considered a multidimensional syndrome resulting from a combination of biological, psychological, and social factors, and interest in frailty research has increased due to the fact that early recognition of these factors can reduce or prevent the adverse consequences of frailty [8–12]. Numer-

ous studies have focused on health variations in frailty among older adults based on socioeconomic status (SES), operationalized by educational level and occupation and/or income [13–18].

One of the socioeconomic conditions known to contribute to the incidence of frailty is poverty [17, 19]. Economic and financial circumstances, including poverty, can be considered a main social factor impacting health outcomes, as it corresponds to a range of risk factors, including sociodemographic and economic factors, that mainly affect people in rural areas. Poverty has both direct and indirect effects on the level of frailty, explaining 61.8% of the variation in the frailty score [17]. It was noted that the level of frailty was higher among older adults with minimum income, getting in the way of fulfilling a healthy successful aging [18]. The older adults who get through poverty transitions, enter poverty, and live in poverty insistently are more prone to high level of frailty [19]. Thus, the investigation of the low income/poverty correlated with frailty is crucial to establish, promote, and drive the social and health policies tailored to combating the adverse health outcomes of poverty [17], such as frailty. To the best of our knowledge, no previous systematic review has investigated these relationships. Thus, the aim of this systematic review was to investigate the frailty in older adults with low income.

Methods

A systematic review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to explore the relationship between poverty and frailty among older adults. The relevant studies in the literature were thoroughly reviewed to assess their quality, and the available evidence was summarized following a clear methodology. A 3-stage search was conducted to find relevant studies published between 2008 and 2020. A primary limited search of the CINAHL, Medline, Google Scholar, and PubMed databases was conducted, followed by a more refined search of the terms within the titles and abstracts and of the index terms used to define each article. All 4 databases were last searched on December 30, 2020. Then, a second search of the selected databases was conducted using the keywords and search terms. Finally, the reference lists of the identified studies were checked to identify other relevant studies. The inclusion criteria were peer-reviewed articles, written in English, and published between 2008 and 2020. The search items included the medical subject heading and inspected the titles and abstracts, and the keywords were “*frailty and poverty*”; “*frailty and socioeconomic*”; and “*frailty and financial*.” The exclusion criteria were reviews, conference abstracts, editorials, and comments. Articles/studies without clearly defined poverty variables were excluded (see Table 1).

Table 1. Initial articles that were identified through the selected search terms

Word combinations	CINAHL	Medline	Google Scholar	PubMed
Frailty and poverty	4	5	4	5
Frailty and socioeconomic	25	35	20	37
Frailty and financial	2	3	3	3
Total = 146				

The 2 authors independently assessed the quality of each study based on a methodological quality assessment tool, thereby reducing the chances of bias or unclear results, and making the review more robust. The authors then compared their findings before reaching an agreement. The Briggs Institute Meta-Analysis of Statistics Assessment and Review Instrument (JBIMASARI) was used to assess the quality of the studies [20]. The evaluation process of data revision was carried out in several stages. First, (1) the selection procedure was completed independently by 2 reviewers based on the study inclusion criteria. Then, (2) the titles and abstracts of the selected studies were primarily screened. This was followed by (3) checking the results of the selected studies to ensure that they focused on the relationship between frailty and poverty or other financial issues. Finally, (4), a discussion related to the effects of poverty and financial issues on frailty among older adults was conducted. Any discrepancies in the findings of the separate reviewers were resolved during the discussion (Fig. 1).

A clear conceptual and/or operational definition of frailty was mentioned in all selected articles. The most of economic and financial issues were often embedded in the background/literature review section. However, poverty or low income was explicitly mentioned in the background or literature review. The measurement and criteria of low income or the minimum income were often vague. The major finding of this systematic review indicates that poverty, low income, or minimum income was most often correlated with the frailty-related adverse outcomes. However, frailty, low income, or minimum income was often addressed alongside other sociodemographic and frailty-related variables in the selected studies. Moreover, the scoring system of frailty instruments was often not reported in the selected studies. The authors discussed any discrepancies in the methodologies and results of the selected articles to critically appraise and check the validity of statistical analyses to answer the research questions provided by the selected articles.

There might be a potential bias of using systematic review method, in which the tool of checking the quality of selected articles does not have a clear evaluation about the psychometric properties of the used tools intended to measure the target variables of the systematic review. Moreover, alternative frailty instruments might not be considered while measuring frailty in different populations of the selected studies. In addition, the method used in the current review is based on the analysis done by the authors, in turn, the subjectivity. In addition, the quality assessment methods are often in need to be standardized with further research.

Results

From the initial search, 146 studies were retrieved, including duplicates (113). Then, duplicates and other articles were excluded based on the eligibility criteria and the analysis of the abstracts and texts, resulting in 9 articles. There was consistency among the findings of the 9 studies (see Table 2) in terms of the relationship between socioeconomic factors and frailty among older adults [16–19, 21–25], although there were variations in the ways that these studies had examined this relationship. These studies were cross-sectional and longitudinal studies. The total number of participants included in the 9 selected studies was 118,866 participants.

Furthermore, 4 out of 9 studies confirmed that socioeconomic factors such as educational level and income are associated with frailty in older adults [16, 17, 21, 25]. Most of the studies confirmed that women, adults aged 65 years or over, and individuals with low educational level are at an increased risk of experiencing a worsening in their frailty state [16, 17, 19, 23, 25]. Furthermore, one study which examined the relationship between disability and poverty using different measures of poverty and inequality confirmed that disability increases the risk of poverty, and that poverty increases the risk of disability

[24]. Hence, disability is considered a predictor of frailty [26].

Six of the 9 studies were found to have investigated the relationship between frailty and poverty among older adults aged over 65 years [16–18, 22, 23, 25]. Meanwhile, one study had investigated this relationship among adults aged 60 years or over [24], Hoogendijk et al. [21] had investigated this relationship among adults aged 50 years or older, and one study among adults aged 45 years or older [19]. The results of all of these studies reported that age is the main coexisting factor for frailty and that poverty or low income increases the incidence of frailty.

Furthermore, one international comparative study [22] was found to have evaluated the effect of income on health-related quality of life (HRQL) among older adults in Canada and the USA. The findings indicated that household income was significantly associated with HRQL. In addition, the study of Hoogendijk et al. [21] was found to have investigated the disparities in health outcomes in dissimilar geographical areas of the world with diverse levels of economic growth, including the world's 2 most overcrowded countries (i.e., China and India). Out of the 9 studies, this was the only study [21] that had considered the role of chronic diseases in explaining socioeconomic disparities in frailty. The find-

Table 2. Summary of the reviewed studies for the relationship between frailty and poverty

Study authors	Assessment for	Type of participants	Participants, <i>n</i>	Method	Main findings about poverty and frailty
Pandey [24]	Association between disability and poverty among Indian elderly	Persons with disabilities	45,571 and 24,731 households in rural and urban areas. Three measures of poverty are used: HCR, PG, and SPG	Cross-sectional research/organization data collected at the individual level from July to December 2002	Disability among economically disadvantaged elderly persons is higher than among persons with average to above average incomes
Youn et al. [19]	Assess the prevalence of frailty in middle-aged and older adults and examine the impact of poverty transition on frailty	45 years or over living in households	9,263 respondents completed the interviews held by well-trained interviewers	Data were collected from the 6-wave Korean longitudinal study of aging (2006–2016). The KLoSA is a large-scale, longitudinal survey of the population aged 45 years or over living in households selected by multistage stratified probability sampling to ensure national representativeness	The findings suggested that those who experience poverty transitions, enter poverty, and remain in poverty persistently are at a higher risk of frailty
Stanton et al. [25]	Determine (1) the extent to which low SES is associated with the increased odds of frailty and (2) whether race is associated with frailty, independent of SES	65 years or over, with difficulties in areas of physical function and a mini-mental state examination	727 older women	A cross-sectional analysis of the women's health and aging studies using multivariable ordinal logistic regression modeling	Odds of frailty increased for those of low education or income regardless of race
Kim et al. [23]	Investigate the prevalence of frailty and the associations among frailty, SES, and HRQL	Healthy participants aged between 65 and 85 years	964 apparently healthy elderly from the Korean community-based population	Prospective cross-sectional study using 964 self-reported questionnaires	Frailty has a significant negative influence on HRQL among the elderly population and acts as a mediator between SES and HRQL
Hoogendijk et al. [16]	Investigate the course of socioeconomic inequalities in frailty among older adults	65 years or older at the time of the medical interview in 1995/1996 (<i>n</i> = 1,509)	710 were still alive after 10 years of follow-up	Longitudinal Aging Study Amsterdam on physical, emotional, cognitive, and social functioning of older adults in The Netherlands during 10 years of follow-up using a face-to-face interview. Main interview and a separate medical interview	The risk of frailty was estimated to be higher in older birth cohorts; in women, in participants with low socioeconomic position, such as lower levels of education and lower incomes, and in participants without a partner
Hoogendijk et al. [21]	Investigate socioeconomic inequalities in frailty among older adults in 6 LMICs, and to examine to what extent chronic diseases account for these inequalities	50 years or over	31,174 respondents from China, Ghana, India, Mexico, Russian Federation, and South Africa	Data were used from WHO's SAGE wave 1 (2007–2010). Standardized survey materials and training were provided for teams in each country, with face-to-face interviews used to collect data	Higher frailty prevalence rates were found in older people with a low SEP in LMICs, and chronic diseases were less common in lower socioeconomic groups. Chronic diseases do not play an important role in explaining the higher frailty prevalence rates observed in lower socioeconomic groups
Huguet et al. [22]	Assess the effect of income on HRQL among older adults	65 years or over	755 Canadians and 1,151 Americans	Using stratified random sampling procedures, 755 Canadians and 1,151 Americans' questioners were collected from the interview	HRQL was significantly associated with household income in the USA but not in Canada among the elderly population

Table 2 (continued)

Study authors	Assessment for	Type of participants	Participants, <i>n</i>	Method	Main findings about poverty and frailty
Stolz et al. [17]	Assess the impact of material, psychosocial, and behavioral factors and education in explaining the poverty-health link	65 years or over	28,360 observations from 11,390 community-dwelling older adults	Retrospective interviews on life histories and complemented by self-completed questionnaires from 10 countries over a 10-year period	Poverty risk was associated with increased levels of frailty among older adults. Rather than educational or behavioral factors, material and, in particular, psychosocial factors explained a large part of the poverty risk-related differences in frailty
Watts et al. [18]	Test whether minimum income for healthy living of a person aged 65 years or over (MIHL65) is associated with frailty in older adults	65 years or over	1,342 participants: Longitudinal study of aging participants, who at wave 1 in 2002, aged 65 years or over, without any limiting longstanding illnesses, and who had the information required to calculate MIHL65 in 2002, 2004, and 2006 and 2 measures of frailty in 2008	Secondary analysis of the English longitudinal study of aging, a multi-wave prospective cohort study	It was found that living below the minimum income in 2002 predicted frailty 6 years later for healthy people aged 65 years or over

SES, socioeconomic status; HRQL, health-related quality of life; LMICs, low- and middle-income countries; HCR, head count ratio; PG, poverty gap; SPG, squared poverty gap.

ings showed the incidence of frailty to be the highest in South Africa. Meanwhile, the incidence of frailty was the lowest in Russia.

Discussion

The current systematic review identified 9 relevant studies in the literature published between 2008 and 2020. The findings of these studies showed that poverty is a socioeconomic risk factor for frailty. The role of social life was addressed by 2 of the reviewed articles as a factor which causes disturbance to older adults' health and which predisposes older adults to frailty and poverty, whereby frailty was positively associated with low income, low educational level, and psychological issues [17, 25]. In most of the selected articles of this review, it was noted that social life contributes to the coexistence of frailty with poor population. This point could be explained through suffering from both poverty and frailty, in which these 2 variables may cause a significant burden on older adults' lives. On the first hand, poverty may negatively impact different aspects of life among community-dwelling older adults in both developing and developed countries. Furthermore, poverty and low income are considered socioeconomic factors which may contribute significantly to the development of frailty and which may impact the quality of life among frail older adults.

Frailty among older adults may arise from the loss of social connections, which may lead to imbalances in their later lives as they may be unable to build new social connections [27]. In the current review, social variables were shown as coexisting factors to both frailty and poverty. This is in concordance with other studies that explained the social variables as part of the consequences of both poverty and frailty, such as the inability to participate effectively in economic and political life, social exclusion, depression, stress, exclusion from decision-making processes, multiple mental disorders, physical health problems, sensory impairments, and impaired functioning [24, 28–30]. Moreover, disability and impaired functioning may lead to the exclusion of individuals from work, education, and healthcare and may increase healthcare costs, which can exacerbate poverty [31, 32].

Individuals may also be considered frail if they do not participate in social activities or suffer from a lack of social integration or support. Older adults who suffer from poverty may struggle to remain integrated in society and socially active, as their low level of income may lead them to hesitate to participate in social activities. Therefore,

older adults with low income may choose to live alone, which may increase their risk of developing frailty as they may be less likely to have the ability to meet their daily needs [33–36]. As a result, poverty raises issues pertaining to the extent to which poor older adults can interact with their neighbors and participate in social activities. Poor older adults have less financial ability to participate in local programs and activities, especially if they do not have personal vehicles or other means of transportation.

In the current review, it was noted that poverty was mentioned as a crucial role in the determination and allocation of environmental resources necessary for meeting the unique needs of older adults with frailty. This could be explained by a previous study [37], addressing several factors associated with preventing frailty, improving quality of life, and increasing longevity among older adults. These factors include “the availability of clean water, abundant food, shelter, heating and cooling systems, relief from hard labor, and antibiotics created” [37]. Such factors may not be achieved without financial support, either from designated institutions for the elderly or older adults themselves. In turn, this raises concerns regarding the sustainability of the living environments that older adults may be transferred to. These environmental factors were addressed in one of the selected articles as part of the socioeconomic inequalities among frail older adults in low- and middle-income countries (LMICs) [21]. This raises the question of how the variation in environmental factors from one county to another impacts both frailty and poverty.

In the current review, it was noted that frailty is associated with increased healthcare costs for both older adults with frailty and healthcare systems. This is in accordance with previous 2 studies [16, 22]. Individuals with higher SES and education are less exposed to health-threatening conditions and are more able to self-monitor and effectively manage resources in order to buffer health threats [16, 22]. For instance, one of the articles selected for the current review revealed that healthy older adults aged 65 years or over with low income are predisposed to frailty after 6 years [18]. Our review indicated that the existence of both poverty and frailty among older adults requires policies and legislations to modify older adults’ living environments, facilitate their admission to and discharge from clinical settings and hospitals, and provide comprehensive health insurance.

Limitations

The selected studies were mainly from the Western countries, which lead to the limitation of representation in other geographic regions in the world, such as eastern

countries. In addition, there is not an agreement about the measurement of frailty in older adults, in particular, those with low income or being poor. Moreover, there might be a potential limitation because of using only the peer-reviewed English language literature.

Conclusion

Frailty should be treated on a holistic basis, considering financial issues. Poverty disrupts older adults’ social activities, hinders them from building successful social relationships, and reduces their quality of life. Prompt solutions need to be implemented to address poverty among frail older adults. In the current review, there are several factors associated with frailty: social life, environmental conditions, and financial issues. These factors were positively correlated and coexisted with both frailty and poverty. Therefore, understanding the complications of poverty among frail older adults is essential for the fair allocation of resources and the implementation of anti-poverty measures.

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Statement of Ethics

An ethics statement is not applicable because this study is based exclusively on published literature.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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Author Contributions

We hereby confirm that all listed authors meet the authorship criteria and that all authors are in agreement with the content of the manuscript. Study conception, design, and analysis were performed by A.H. and M.R.; data interpretation was carried out by A.H. and M.R.; manuscript preparation was done by A.H. and M.R.; A.H. involved in final approval of the manuscript version to be published.

Data Availability Statement

All data generated or analyzed during this study can be requested from the first author upon a reasonable request.

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