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Multidimensional factors affecting homebound older adults: A systematic review

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Abstract

Purpose: To systematically identify the multidimensional factors affecting homebound older adults.

Design: Systematic review.

Methods: We searched PubMed, MEDLINE, Cochrane Library, CINAHL, EMBASE, and PsycINFO from inception to November 15, 2020. This systematic review followed the Preferred Reporting Items for Systematic Review and Meta-analysis guidelines. The Joanna Briggs Institute Critical Appraisal Checklist for Analytical Cross-Sectional Studies was used for quality assessment.

Findings: Nineteen studies met the review criteria; the studies were either cross-sectional or longitudinal. Most studies have focused on personal factors affecting homebound older adults. The individual construct consisted of demographic, biological, psychological, functional, and health-related factors. The structural construct included architectural, environmental, community, and social factors. Based on the different definitions of homebound used in the studies, the prevalence of homebound status ranged from 3.5% to 39.8%.

Conclusions: The prevalence of homebound status among older adults varied depending on how homebound was defined. Homebound status is the interaction between the individual and structural constructs. Variations in cultural, political, and economic conditions could influence homebound status across countries over time. Comprehensive assessment and interventions for homebound older adults based on multidisciplinary approaches are recommended for nurses.

Clinical relevance: This research will impact the development of nursing strategies to screen homebound older adults and provide targeted preventive interventions so that older adults with many risk factors do not become homebound.

KEYWORDS
factor, homebound, older adults, systematic review

INTRODUCTION

The global population of older adults will increase from 900 million to 2 billion between 2015 and 2050 (World Health Organization, 2018), and thus, the number of homebound adults will also increase (Herr et al., 2013). An individual is considered homebound if he or she stays at home for a certain period of time without going out; such individuals are typically socially isolated (Sakurai et al., 2019; Szanton et al., 2016). Homebound older adults experience decreased physical activity, psychological health, and quality of life, which places enormous pressure on their families, society, and themselves (Qiu et al., 2010; Stall et al., 2014). Homebound status further impacts the health care system, directly increasing the cost of care (Musich et al., 2015; Szanton et al., 2016). As a result, there is increasing public concern about how to provide this population with healthcare (Musich et al., 2015; Qiu et al., 2010; Szanton et al., 2016). Information on homebound status is critical to maintaining and improving homebound older adults' health and quality of life as well as alleviating the burden on their families and society (Jing et al., 2017). A holistic approach to health must be taken to achieve these goals since, according to the World Health Organization, health includes interpersonal interactions and social life (World Health Organization, 2008).

The literature shows that the definition of "homebound" has changed over time. In the 1960s, homebound status was defined based on physical issues or a disability (Lindesay & Thompson, 1993). In the 1970s, there was increased recognition that other factors beyond physical diseases may affect homebound older adults (Lindesay & Thompson, 1993). After the 1990s, the literature expanded to include social and environmental aspects (Cohen-Mansfield, Shmotkin, & Hazan, 2010, 2012; De-Rosende Celeiro et al., 2017; Ida et al., 2020; Inoue & Matsumoto, 2001; Lindesay & Thompson, 1993; Murayama et al., 2012). However, no study has integrated the existing literature, perhaps because of the differences among the studied populations and the provided definitions (Qiu et al., 2010). Considering current public concerns about homebound older adults, an overall comprehensive synthesis is needed.

The present systematic review aimed to: (a) identify the worldwide prevalence of homebound status among older adults, (b) examine how different definitions of homebound have been used, (c) assess factors affecting homebound older adults and synthesize findings on these factors, and (d) examine the impacts of homebound status on older adults. This review provides a holistic assessment of the topic by analyzing the individual and structural factors affecting homebound status, which is a particularly important issue in the age of COVID-19.

Methods

This systematic review has been registered in PROSPERO 2020 (CRD42020175812). We followed the guidelines presented in the Cochrane Handbook for Systematic Reviews of Interventions to ensure consistency and rigor (Higgins & Green, 2011). The results were reported based on the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines (Liberati et al., 2009).

Search methods

The PubMed, MEDLINE, Cochrane Library, CINAHL, EMBASE and PsycINFO databases were searched. These results were supplemented by manually searching the reference lists of the included studies. The language was restricted to English. No date restriction was applied. The search was conducted from inception to November 15, 2020. The keywords were "homebound persons [Mesh terms]," "home-bound," "house bound," "outdoor*," "aged [Mesh terms]", "older adults," and "elderly." The full search strategy is provided in Table S1.

The search strategy and search terms were based on the PICO format which stands for: P (population), I (indicator), C (comparison/control) and O (outcome of interest) (Liberati et al., 2009). The research question in the "PICO" format was as follows: What are the factors (O) associated with homebound (I) compared to non-homebound (C) older adults (P)?

Eligibility criteria and study selection

PICO was used as a criterion for eligibility criteria. In other words, original full-text quantitative studies that investigated the factors affecting homebound status among older adults were included. Quantitative studies included either cross-sectional or longitudinal studies. Studies that investigated specific concepts or phenomena such as falls of homebound older adults, which were not the factors affecting homebound itself, were excluded.

Our initial search yielded 1033 studies after removing duplicates (Figure S1). YS and YK screened articles independently after reading titles and abstracts. After screening, full texts of 31 articles were evaluated by two researchers independently, to determine their eligibility. Of these 31 studies, three were reviews, three were not original articles, and six were not written in English. Upon discrepancy, JHL, a neutral reviewer, joined and consensus was reached through discussion by all three researchers. All three authors agreed on the final 19 articles based on the eligibility criteria of this study.

Quality appraisal

The Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Analytical Cross-Sectional Studies was used for quality assessment (Moola et al., 2017). The JBI Critical Appraisal Checklist for Analytical Cross-Sectional Studies has not presented the cut-off for determining the good quality of the study. The checklist is to review the appropriateness of the evaluation items; however,

considering the quality appraisal of other research, such as the JBI Critical Appraisal Checklist for Randomized Control/Pseudo-randomized Trial, the JBI Critical Appraisal Checklist for Comparable Cohort/Case Control or the JBI Critical Appraisal Checklist for Descriptive/Case Series, there should be at least five "yes" items among all items (Apóstolo et al., 2018). The same criteria were applied in our study. Two independent reviewers assessed whether each study met each of the eight items on the checklist, indicating "yes," "no," "unclear," or "not applicable" (Table S2). No studies were excluded. The researchers discussed any inconsistencies until reaching an agreement.

Data extraction and synthesis

We presented the data for cross-sectional (Table S3) and longitudinal studies (Table S4) separately. We extracted data on the country, study purpose, number of participants, brief sample description, age, gender, prevalence, measurement of homebound status, definition of homebound, factors related to homebound status, and impacts. A meta-analysis could not be performed due to the heterogeneous definitions of "homebound" across the studies. The data were independently extracted by all authors, and consensus about discrepancies was achieved through discussion.

We summarized and analyzed all of the data using an Excel spreadsheet. The identified factors were coded and grouped based on relevance. Each subgroup was categorized as either an individual or structural construct (Table S5). We focused on the results of the multivariate analysis rather than univariate analysis for the cross-sectional study and the main follow-up results for longitudinal studies. The prevalence of homebound status could not be standardized due to different definitions of the term "homebound." Additionally, the impacts of homebound status could not be synthesized due to the small number of studies and the different variables used.

RESULTS

Study characteristics

The characteristics of the included studies are presented in Tables S3 and S4. The included studies were either cross-sectional ($n = 11$) or longitudinal studies ($n = 8$) published between 1993 and 2017. The studies covered Japan ($n = 7$), the United States ($n = 4$), Israel ($n = 3$), Spain ($n = 2$), France ($n = 1$), the United Kingdom ($n = 1$), and China ($n = 1$). The studies included national samples ($n = 6$) or community-dwelling samples ($n = 13$). The number of study subjects in each study ranged from 112 to 25,725 individuals, and the mean age ranged from 69.4 to 84.0 years. In all studies except for three that did not report the number or proportion of females, more than half of the participants were female. The prevalence of homebound status ranged from 3.5% to 39.8%. In all studies, homebound status was evaluated by asking the participants; two studies, also included the interviewer's assessment and judgment about the participants' homebound status (Herr et al., 2013; Lindesay & Thompson, 1993).

Quality appraisal

For the eight items in the JBI Critical Appraisal Checklist for Analytical Cross-Sectional Studies, all included studies met "described the study subjects and setting in detail," "used objective standard criteria to measure the condition," and "used appropriate statistical analysis." Of the eight items, 89.5% of studies "measured the results in a valid and reliable way," 68.4% of studies "identified confounding factors," "strategies to deal with confounding factors stated," and "clearly defined the criteria or inclusion criteria for the sample." "Exposure measured in a valid and reliable way" was the criterion that the smallest number of studies met, with the results being unclear for 13 of the studies. All studies had obtained "yes" for at least five of eight items (Table S2).

Features of homebound status

The primary method of assessing homebound status was by measuring the frequency of leaving the house ($n = 13$), functional difficulty when leaving the house ($n = 4$), and a combination of both the frequency and functional difficulty of leaving the house ($n = 2$). When defining homebound status based on the frequency of leaving the house, the majority of the studies used a one-week as the standard. In other words, ten studies defined homebound individuals as those who left the house less than once a week. When defining homebound status based on functional difficulty, most studies evaluated whether older adults needed help when they went out, including due to ambulatory disability. Recent studies have emerged combination of these two attributes defining homebound status (Ornstein et al., 2015; Soones et al., 2017).

The secondary assessment showed that factors related to homebound status were categorized into individual and structural constructs (Table S5). For the individual construct, advanced age was the most common predictor. The second most common factor was gender, with women being more likely to be homebound than men, followed by cognitive impairment. For the environmental construct, home entry/exit was the most common factor. This construct included the presence of stairs, the lack of an elevator, the presence of architectural barriers near the home entrance, heavy doors, raised entry floors, and no access to a car.

A tertiary assessment showed the impacts of homebound status (Tables S3 and S4). Five longitudinal studies presented the impacts of homebound status on mortality by identifying the risk of death in the next 2–20 years (Cohen-Mansfield et al., 2010; Herr et al., 2013; Jacobs et al., 2008; Sakurai et al., 2019; Soones et al., 2017). A prospective cross-sectional study reported the impact of homebound status on healthcare utilization, expenditures, compliance with medication adherence and care pattern standards (Musich et al., 2015).

Another longitudinal study measured the incidence of physical disability and recovery in two years (Fujita et al., 2006).

DISCUSSION

The homebound status of older adults is a social phenomenon that requires a continuum of care. Interest in this topic has existed globally since the 1960s and continues to the present. Although there is a lack of consensus on the definition of homebound status, it is evident that the homebound population is growing (Qiu et al., 2010). In this review, we explored how definitions of homebound vary, and suggested directions on how to define homebound. Additionally, we identified multidimensional factors affecting homebound older adults and explored the impacts of homebound status.

Notably, the identified research on homebound older adults was conducted worldwide. In the excluded articles in our selection process, the study regions included Brazil (Ursine et al., 2011) and South Korea (Choi et al., 2012). There was a study in Australia on the needs of homebound people (Vowles et al., 1979), demonstrating the long history of global interest in homebound individuals. Research on homebound older adults dominates public health studies in Japan and the United States in response to their rapidly aging populations. Japan has emphasized the prevention of older adults from becoming homebound as a major issue for the country's universal long-term care system (Tsutsui & Muramatsu, 2007), and in the United States, the national government provides older adults with Medicare home care benefits (Musich et al., 2015).

Based on the different definitions of homebound employed in the screening of homebound older adults, a wide range of people were considered homebound, and the prevalence of homebound status ranged from 3.5% to 39.8%. Three studies did not specifically define homebound but classified the frequency of going outdoors into categories (Fujita et al., 2006; Jacobs et al., 2008; Kono et al., 2004). In each study that defined homebound based on the frequency of leaving the house, the standard was set at a monthly or weekly basis. Based on a narrow definition of homebound as leaving home less than once a month, the prevalence of homebound status ranged from 3.5% to 9.8%. However, based on a broader definition of leaving home less than once a week, the prevalence increased to a range of 10.3%–39.8%. When homebound was defined based on functional difficulty, the prevalence was in the range of 4.7%–34.8%. When both the frequency of leaving the house and functional difficulty were used to define homebound, the prevalence decreased sharply to 5.6%–7.5%. Thus, depending on how the term is defined, the prevalence of homebound status varies widely, so nurses should keep this in mind when referencing this term. In the formulation of a nursing strategy for homebound older adults, it is necessary to use an appropriate definition of homebound according to the purpose and scope of the strategy. In synthesizing the results, we suggest that the definition of homebound in older adults include both the frequency of leaving the house and functional difficulty considering age-related changes. In this definition, rather than simplifying the definition of homebound, we suggest taking a more specific and stratified approach on frequency by differentiating homebound and semi-homebound on a weekly or monthly basis and the level of functional difficulty.

Homebound status is seen as a result of the interaction between individual and structural factors (Figure 1). Findings on the individual construct indicate that attention should be paid to older women. Physical and cognitive functioning declines over time and going outdoors requires a certain level of functioning (Fujita et al., 2006; Kono et al., 2004). For example, disability, which is another strong determinant of homebound status, results from the interaction between health conditions and contextual factors (Negron-Blanco et al., 2016; World Health Organization, 2008). In this review, we found that more homebound individuals than non-homebound individuals reported a physical disability, low activities of daily living (ADL), low instrumental ADLs, or cognitive impairment. Homebound status leads to further decreased

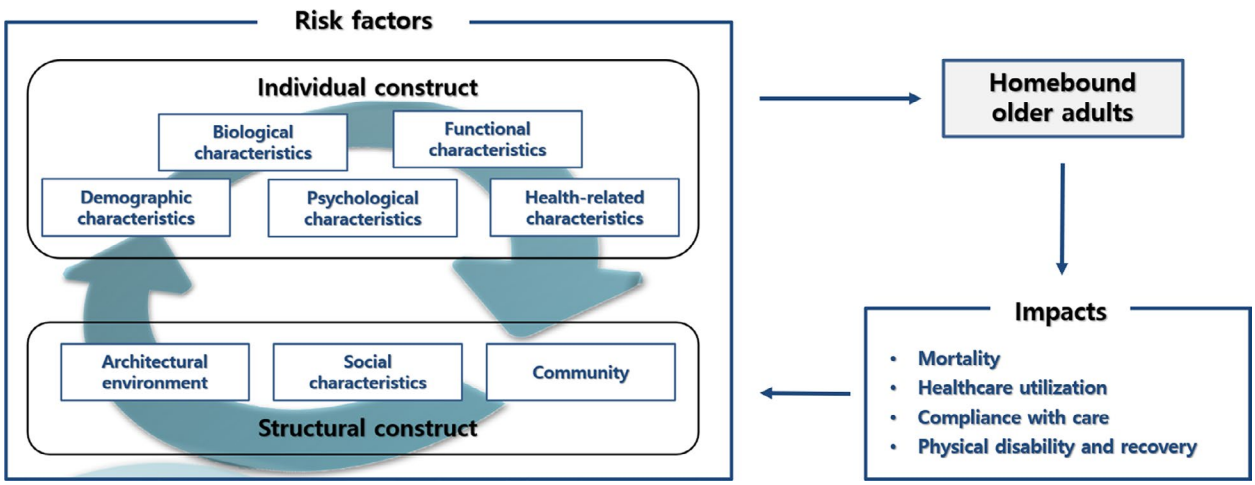

FIGURE 1 Homebound status as an interaction between individual and structural factors and its impacts

physical activity; therefore, it is a critical issue for older adults (Fujita et al., 2006). Considering the aging process and the associated ailments, special attention should be paid to this population (Jing et al., 2017). Comorbidity and depression were also found to influence homebound status. In line with our findings, another study reported that homebound older adults experience more physical and psychological conditions such as cardiovascular and musculoskeletal disease, cognitive impairment, and depression, than non-homebound adults (Qiu et al., 2010). These factors are useful for identifying older adults at risk of becoming homebound (Ganguli et al., 1996). Future research on how to address modifiable factors to improve prevention is needed. Non-modifiable factors should be addressed in home health care services.

Generally, structural constructs can be divided into architectural environmental, social, and community factors. The elements of the architectural environment found to be associated with homebound status included physical barriers near the home entrance, a heavy door, stairs, the lack of an elevator, and raised floors outside the house. These factors eventually lead to mobility issues. Nursing interventions should address mobility skills and refer healthcare services to target home modifications to prevent or decrease homebound status. For example, outdoor home modifications or the conversion of stairs to ramps with a grab bar can facilitate wheelchair mobility (De-Rosende Celeiro et al., 2017). Indoor modifications include removing or mitigating functional obstacles (Cohen-Mansfield et al., 2012; De-Rosende Celeiro et al., 2017). Home modifications should be planned based on the needs of the individual. It is important to establish a home care system that helps elderly individuals overcome restrictions and enjoy outdoor life (Inoue & Matsumoto, 2001). Regarding social factors, homebound older adults can use home care and social services. Recently, home and community-based primary care for older adults has attracted attention (Leff et al., 2015; Norman et al., 2018). In home and community-based primary care, a multidisciplinary health team provides health care. This care meets not only the health-related needs of homebound older adults including access to medical services, but also their social needs such as housing and transportation (Norman et al., 2018). Nurses assist in homebound older adults' health care, and social workers link them to community services (Leff et al., 2015). Further research needs to focus on the strength of the multidisciplinary approach, and determine the multidimensional effects that this care has on the outcomes of homebound older adults. Additionally, assessing the surrounding community environment is critical to encourage older adults to go outdoors (Tsutsui & Muramatsu, 2007).

The findings on the impact of homebound status may not be generalizable because few studies have examined this issue, and the outcomes were different. Nevertheless, the increased disability and mortality rates of homebound older adults and the issue of healthcare costs suggest that homebound status among older adults is a critical public health concern. Furthermore, the literature suggests that homebound older adults are less likely to be compliant with medications and care pattern standards than non-homebound older adults, suggesting potential intervention areas for home care nurses. Health care professionals, including both nurses and policy makers, should pay attention to future research and interventions for homebound individuals. Future research needs to examine the effect of the interaction between individual and structural constructs on homebound status.

Several limitations of this study should be noted. First, there may be differences in the aspects of each study such as demographic changes and health care environment. There may be variations in the cultural, political, and economic conditions that influenced homebound status across the studied countries and over time. Further research is needed to enrich the understanding of homebound older adults in the 21st century. Second, meta-analysis was not used in this study, as the included studies used heterogeneous definitions of homebound. Therefore, a descriptive approach was more appropriate for this study.

CONCLUSIONS

This is the first study to comprehensively review multidimensional factors affecting homebound older adults. Nurses should be aware that the prevalence of homebound status among older adults varies depending on the definition of homebound status. Based on the results, strategies should be developed by nurses to address individual and structural constructs influencing homebound status. Such customized strategies could include screening older adults who are homebound and providing targeted preventive intervention so that older adults with many risk factors do not become homebound. Although few studies have explored the impacts of homebound status among older adults, the literature on increased mortality rates in this population suggests that it is an important issue. Since the number of homebound older adults has increased due to the COVID-19 pandemic, it is suggested that future research examining the effects of emerging infectious diseases is required.

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Not applicable.

CLINICAL RESOURCES

- Healthy People 2030. Improve health and well-being for older adults. https://health.gov/healthypeople/objectives-and-data/browse-objectives/older-adults
- Family & Nursing Care. 12 Ways to Help a Homebound Senior Stay Involved in Life. https://www.familynursingcare.com/12-ways-to-help-a-homebound-senior-stay-involved-in-life/

CONFLICT OF INTEREST

The authors have no conflicts of interest declare.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

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