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Physical and Mental Health of the Homebound Elderly: An Overlooked Population

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Abstract

There are currently more than 38.9 million people over the age of 65 in the United States. Up to 3.6 million of these people are considered housebound and in need of home-based care. Although homebound status is not defined specifically, with a broad range of disability levels, it is evident that people who are homebound suffer from a multitude of medical and psychiatric illnesses. This review examines the current literature to identify the specific physical and psychiatric factors most responsible for the elderly becoming and remaining housebound. The homebound elderly suffer from metabolic, cardiovascular, cerebrovascular, and musculoskeletal diseases, as well as from

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Author Contributions:

Wei Qiao Qiu: Dr. Qiu is the principle investigator who conceived and designed this article on the homebound elderly. Dr. Qiu performed extensive research on the topic of homebound elderly and made large contributions to the writing of the article. She also edited the article many times and prepared the manuscript for submission. Dr. Qiu's writing and revisions made substantial improvements to the intellectual information portrayed in the article.

Michael Dean: Mr. Dean performed extensive research in the area of homebound elderly and his research was used to write a substantial amount of the article. His research helped to improve the intellectual knowledge in many areas of the article. Mr. Dean also wrote a majority of the paper and revised the article multiple times to improve the information found in the article. He also helped prepared this article for submission.

Timothy Liu: Mr. Liu performed a majority of the research for this article on the homebound elderly. His research directly contributed to many of the sections of this article and significantly improved the intellectual knowledge displayed in this article. In terms of writing, Mr. Liu wrote many parts of this article.

Linda George: Gave her perspective from the homecare agency point of view and edited the article to improve upon sections of the article that discussed homecare agencies and homecare practices

Margery Gann: Gave her perspective from the homecare agency point of view and edited the article to improve upon sections of the article that discussed homecare agencies and homecare practices

Joshua Cohen: Dr. Cohen gave important insight on the economical part of this article and edited the article to improve upon the economical aspects of caring for the homebound elderly.

Martha Bruce: Dr. Bruce is an expert in the homebound elderly research. She and Dr. Qiu together designed this article, and edited the article to improve upon the overall intellectual knowledge within the review paper

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cognitive impairment, dementia and depression, at higher rates than the general elderly population. The information in this review will explain the specific types of care the homebound population need, and discuss the care that could help ease their suffering and delay their entry into a nursing home or hospital.

Keywords

homebound; psychiatric; medically

INTRODUCTION

Globally, life expectancy has increased nearly 30 years during the 1900s. According to the Administration on Aging, the number of persons aged 65 and above in the United States has grown in past century from 3 million (about 4% of the population) to over 38.9 million (12.8% of the population) in 2008. By 2030, because of the aging “baby boomers” and increased life expectancy, about 72.1 million or more than 1 in 5 Americans will be aged 65 or above. As the population ages, many will become homebound and need home-based care. 1

The care of homebound elders has caught the attention of internists, dentists, nutritionists and psychiatrists alike. Homebound elders, while not institutionalized, are confined to their homes due to physical, psychiatric, and social limitations. This particular population is of interest to the medical and scientific community, because the homebound elderly suffer from physical and psychiatric illnesses at a much higher rate than non-homebound elders. The discrepancy in the prevalence of illnesses seen in the homebound elderly is exemplified by comparing the Nutrition, Aging, and Memory in Elders Study (NAME) and the Framingham Heart Study. The NAME study recruited and studied hundreds of homebound elders through homecare agencies in the Boston Massachusetts area,2 while the Framingham Heart Study enrolled largely non-homebound elders from the general population in the Framingham Massachusetts area. Overall, the participants in the NAME study suffered from many more medical and psychiatric illnesses than the elderly participants in the Framingham Heart Study (Table 1).

In order to synthesize the current knowledge on the medical and psychiatric morbidities affecting homebound elderly, we used the key words, “homebound, homecare, and elderly” in PubMed to search for the articles used in this review. We found that little research has been done to improve the quality of life and care for homebound elders even though providing improved home health care to this population might delay or prevent nursing home and hospital placements,

DEFINING HOMEBOUND STATUS

The first challenge in conducting meaningful research on the homebound elderly population is to precisely define this population. Literature on the elderly has advanced four definitions of homebound status, each reflecting the perspective of a different stakeholder:

1. Medicare defines an individual as homebound if leaving the home requires substantial effort or assistance, and if this limitation is due to an illness or injury. The individuals whom satisfy this definition leave home briefly and infrequently, or leave only when in need of medical care. The 2001 Health Care Financing Administration guidelines explicitly allow for departures from home to participate in certified adult-day-care programs and religious services.3

2. Researchers have defined homebound status based on self-reported degrees of confinement (see Table 2). These criteria can vary in terms of the minimum duration of confinement (e.g., one week, one month), the maximum frequency of departure from the home (e.g., never except in the case of emergencies, or no more than 2 days per week), and even in terms of what type of criteria are included in the definition (e.g., some definitions do not mention a minimum duration of confinement).

3. Some studies, such as the NAME study, use the status of recipient of Certified Home Health Care Program/agency as being homebound because anyone receiving home care should have satisfied Medicare's homebound criteria before being accepted into these programs. It is conceivable, however, that this approach includes some individuals who receive home care services but do not satisfy the research definition of homebound described above. It also excludes individuals who might otherwise be 'homebound' but do not receive formal home care services.

4. Private, community-Based Health and Human Service Providers aim to serve the homebound and elderly individuals who have a significant degree of permanent functional limitation.4 However, some their elderly patients do not satisfy these criteria yet still receive care.

All of these definitions have limitations. For example, identifying the homebound elderly based on their use of services is biased because social, cultural, clinical reasons, or they fail to satisfy the service-use criteria for some reason not directly related to their homebound status. On the other hand, identifying homebound individuals by self-report, an approach often used in population-based studies, can produce biased results based on differential recall or self-assessed capacity. More importantly, this lack of consensus makes research like meta-analyses more difficult, since a heterogeneous homebound population might include individuals who are at different levels of being homebound.

MEDICAL DISORDERS OF HOMEBOUND ELDERLY

Clinical problems in the homebound elderly are often multifaceted.5,6 A recent study showed that 40.8% of homebound elders suffered from 2 to 3 comorbid medical/psychiatric conditions while 31.9% of homebound elders suffered from 4 or more comorbid conditions. 7 Although the population samples may not be completely representative of the homebound elderly or representative of certain homebound elderly, the findings are consistent in that the homebound elderly have high rates of certain medical disorders regardless of the criteria used.

Cardiovascular disease often makes elderly individuals homebound. In an early case series of 184 patients from the Chelsea-Village Program in New York, 43.5% (N = 80) of the sample had medical disorders as the primary cause of disability. Among the medical disorders the homebound elders had, cardiac disease was the most common (N = 27), followed by generalized weakness (N = 18), and chronic pulmonary disease (N = 15).8 More recent studies have shown similar results, including results from a survey conducted from 1992 to 1999, and data from the 1993 National Home and Hospice Care Survey.4,9 In recent years, hypertension (74.4%), diabetes mellitus (31.0%), and heart disease (20%) were the three main physical problems resulting in the elderly being homebound. 7, 10 Our own study, the NAME study,2 has shown that a homebound elderly population in the Boston area had higher rates of cardiovascular disease and hypertension than an elderly population from the Framingham Heart Study that was largely not homebound (Table 1).

Musculoskeletal morbidities are also highly prevalent among homebound elders and may contribute significantly to their risk of becoming homebound.4,8 Musculoskeletal disease including osteoarthritis was the most prevalent chronic disease among elderly home health care recipients (42-60%).7,11 Similarly, arthritis of the "spine" was significantly associated with being homebound in a population-based study in rural Pennsylvania.12 As reported in 2008, 10.5% of the homebound population receiving care was homebound due to musculoskeletal diseases.10 In the NAME study, we found that the homebound elderly were prone to unstable gait and falls, which were associated with abnormality of the corpus callosum.13

Other factors may also contribute to the elderly becoming homebound. A study of elders in a rural area that compared people who were homebound to those who were not, found that being homebound was associated with a history of stroke and angina, as well as other conditions including weight loss, falls, and arthritis of the spine. Of these elders, however, only weight loss remained significantly associated with being homebound in an adjusted analysis (OR=3.7).12 A significant association was also observed between poor mobility and being homebound (X^2 = 124.7, p<0.01). Among patients capable of traveling by bus, none were homebound. Among patients capable of walking 5 meters, 20.3% were homebound. Among patients unable to walk, 75% were homebound. The fact that 3 out of every 4 subjects unable to walk were homebound while only 1 out of every 5 subjects who could walk at least 5 meters was homebound, highlights the importance of psychosocial factors, which are potentially modifiable.14

PSYCHIATRIC DISORDERS OF HOMEBOUND ELDERLY

Psychiatric disorders are common among the homebound elderly (40.5%)15 and the two most prevalent mental disorders among the homebound elderly are dementia and depression. 16 Dementia, including Alzheimer's disease, is the leading problem associated with being homebound, affecting 29% of the homebound population.17 A recent study showed that up to 17% of homebound elders have undiagnosed cognitive impairments.18 Our study showed that the homebound elderly had a high rate of cognitive impairment, especially in the memory and executive domains, which is associated with type 2 diabetes.19

There are numerous mental disorders in addition to dementia, such as depression, which affect the homebound elderly at a high rate.20 A service started in the 1970s in Seattle found that homebound elders were most often diagnosed with depression (13%), substance abuse (10%), paranoid illnesses (9%), and dementia (21%). Most substance abuse cases were associated with alcoholism.21 A study of 176 homebound elderly visited by a single psychiatrist reported that that 90% (N = 158) had concrete psychiatric diagnoses, with dementia (53%), depression (29%), and paranoid disorder (7.6%) among the most common. 22 The NAME study also showed that the homebound elderly population in the Boston area had a high rate of depression, including different depression subtypes, such as vascular depression and possible prodromal depression of Alzheimer's disease.23,24

According to DSM-IV criteria, a recent study of 539 homebound patients newly admitted to a visiting nurse agency reported a 13.5% prevalence of major depressive disorder (MDD). Most (71%) of these patients were experiencing their first episode, and the episode had lasted for more than 2 months in a majority of the patients (78%). However, only 22% of the depressed patients were receiving antidepressant treatment.25 The prevalence of depression among home health care recipients was comparable to the prevalence among nursing home patients (15.5%),26 and more than three times as the primary care patients 60 years or older (4%).27

There are few studies that compare the mental health status of individuals who are homebound to the mental health status of those who are not. Data from the Epidemiologic Catchment Area (ECA) program in New Haven (N = 2,553 elderly subjects) showed that for elders confined to a bed or chair, the rates of cognitive impairment (21.8% vs. 11.0%, $p<0.001$), depression (2.3% vs. 0.7%, $p<0.01$), dysthymia (3.9% vs. 1.7%, $p<0.01$) and anxiety disorders (2.2% vs. 0.4%, $p<0.001$) were each at least twice the corresponding rates of elders who were not homebound. After controlling for physical health status and socioeconomic functioning, only dysthymia and alcoholism remained significantly more prevalent among homebound elders than non-homebound elderly.28 Similarly, a study in rural Pennsylvania showed that depressive symptoms were independently associated with homebound status (OR = 2.1, CI = 1.3–3.2).12

Being homebound and needing homecare may be a product of poor health, functional disability, and psychosocial deprivation. Losing contact with the health care system and the social world makes elders progressively more ill, lonely, and depressed.29 Whether or not psychiatric disorders and psychological problems contribute to the risk of becoming homebound or are caused by being homebound is difficult to disentangle, and it is likely that each exacerbates the other. One prospective study, carried out in East Boston, has addressed this issue. This study identified poor performance on mental status test items as one of the predictors of incident home care use after adjusting for sex and age. Other predictors for becoming homebound were 1) receiving help for at least one ADL, and 2) reduced social involvement.30

Homebound elders often suffer from a combination of physical and mental health disorders. It was shown that among home health patients, those with depression had a greater likelihood of adverse falls and being hospitalized than those without depression.31,32 Not only does having a psychiatric disorder make the overall treatment of homebound elders more complex and arduous, psychiatric disorders also increase the difficulty of managing a homebound elder's physical disorders. Homebound elderly with medical disorders and cognitive impairment were shown to often be noncompliant with their treatment plan too.33 Although psychiatric disorders are common among the homebound elderly, primary care physicians made few psychiatric referrals (2.3%).22 Additionally, psychiatric disorders were rarely the primary admission diagnosis leading to the provision of home care service.

According to National Home and Hospice Care Survey (NHHCS), in 1996, only 1.7% of elderly clients were receiving mental health services at the time of the survey, and no patients were provided home care services primarily because of mental disorders.34 Homebound elders in rural areas, who represent a large proportion of the homebound population, were not being seen by properly trained mental health professionals, were not being diagnosed, and were not receiving treatment for their mental health issues.35 Many homebound elders might be suffering from mental disorders, but due to the lack of access to mental health professionals, the homebound elderly do not start receiving home care until a physical problem arises.35 Nevertheless, a recent published paper by Li and Conwell showed the association between the treatment of depression or the treatment of cognitive impairment and the improved physical disability in the home care elderly, indicating the importance of mental health services in this population.36

GROWTH OF THE HOMEBOUND POPULATION AND THE COST OF CARE

Understanding how large the homebound population will become in the future is crucial for public health professionals and decision makers in the government. More importantly, research needs to be conducted regarding the optimal models of care for the homebound elderly. Using 1986 U.S. census data, researchers estimated that in Kentucky there were

approximately 36,000 homebound residents; approximately 2.7% of the households in Kentucky reported at least one person who was homebound.37 A study in Pennsylvania found that 10.3% of elders were homebound.12 Data from the U.S. Census show that as of 2006, over 4.3 million elderly people could be classified as homebound. The growth of the homebound elderly population reflects the growth in size of the elderly population as a whole.

Despite differences in how various studies define the homebound elderly population, they consistently show that this population is growing. Data from the National Home and Hospice Care Survey shows that home health care was the most rapidly growing segment of the U.S. health care system during the 1990s. The number of persons served by home health care agencies rose from 1.2 million in 1992 to 3.6 million in 1996, tripling in less than 5 years.38–42 The incident rate of home care use is another way of describing the magnitude of the homebound elderly problem. A prospective study done in Boston found that among 3,706 people over 65 years of age, the overall age-sex adjusted two-year incident rate of home care use was 3.2%.30

The problem of mental illness among the homebound elderly is only increasing. A recent study shows that approximately 42% of people 65 and older have at least one mental illness. Of the 42% of the elderly who have a mental illness, 40% percent are homebound and receiving care in their home.16 Therefore, for every 1000 people age 65 and older, 168 (16.8%) are homebound and receiving homecare. Recent data have shown that homebound elders with 5 or more chronic psychical and psychiatric conditions consume two-thirds of Medicare expenditures.43

The rapid growth of this population has had a substantial impact on the health care system. In 2004, home health care costs amounted to 43 billion dollars. In 2009, this cost reached 72 billion dollars.42 By the year 2014, home care costs are expected to reach 104.2 billion dollars and reach 154 billion dollars by 2019.42 In the year 2000, 79% of the elderly population with long-term care needs used home healthcare, costing 64 billion dollars, while 21% of this elderly population used nursing home care, costing 138 billion dollars.44 Thus, home care is still less costly than assistant living or nursing home for the elderly who are homebound.

The current homecare system in the United States probably needs to be improved. The majority of homecare agencies hire nurses instead of physicians and there is about 1 nurse for every 20 homebound elderly patient.10 One study from Sweden showed that there was not enough partnership between homecare agencies and physicians to properly take care of this population, especially for those with cognitive impairment.33 A recent study conducted by the same group of researchers showed that it is crucial to have collaboration between homecare staff and family physicians to make the best medical decisions for the patient.45 Since there are high rates of mental illness, including dementia and depression, among the homebound elderly, the involvement of psychiatrists in homecare might be beneficial, but no study has yet to demonstrate this.

CONCLUSION

As the number of homebound elderly increases, so will the need for medical professionals who can treat the homebound elders' medical and psychiatric problems. As evidence shows, heart disease, circulatory problems, dementia, and depression are the main health conditions contributing to the need for homecare among the elderly. Also, most of the elderly who need homecare assistance have multiple debilitating health problems. There must be more research to identify the best way and setting for treating these illnesses to maximize patient

comfort and minimize cost. Future research probably should focus on: 1) what modifiable and nonmodifiable factors attenuate an elderly person deterioration, nursing home placement and death; 2) what helps and will help the homebound elderly to continue to live at home with optimal homecare; and 3) what is the interactions between the brain and mind, between the brain and body, and between the brain and behavior in this population, which will inform enormously not only on successful vs. ill aging in medical research but also on cost effective treatments in public health.

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Table 1

Prevalence of physical and mental illnesses in the homebound population (NAME) compared to the non-homebound (Framingham) population

	NAME STUDY (homebound)	Framingham Study (non-homebound)
Age, mean ± SD	76.2 ± 8.4 2	76.6 ± 6.0 46
Diabetes	39.0% 2	11.4% 46
Stroke	21.0% 2	1.7% 46
Hypertension	92.0% 2	41.1% 46
Cardiovascular disease	42.5% 23	23.6% 47
Body Mass Index (BMI)	31.0 2	27.2 48
Dementia (including Alzheimer's Disease)	31.4% 2	0.3% 46
Mild Cognitive Impairment (MCI)	34.3% 2	24% 46
Depression	30.0% 2	9.4% 47

The data from the references, 2, 23, 46–48, are presented for the homebound and non-homebound populations in the Boston area. NAME: the Nutrition, Aging, and Memory in Elders study

Table 2

Authors	Definitions of homebound status based on self-reported behaviors
Williams and Butters 199237	Homebound was defined as a person who is unable to get out of the house morethan 2 days per week because of a physical or medical limitation.
Gilbert, Branch, et al. 199249	Subjects were asked “About how often do you get out of your house or building for any reason?” Four answers were provided and those who chose “never or almost never except for emergencies” were operationally defined as homebound.
Bruce and McNamara 199228	Subjects were asked whether or not they stayed in their beds or in a chair for most or all of the day during the last 2 weeks; and whether or not they had stayed indoors most or all of the day during the last 2 weeks. The two questions were combined resulting in a three level indicator of degree of homebound status.
Lindesay 199350	Homebound was defined as “not getting beyond the door for at least the last month”.
Ganguli, Fox, et al.12	Homebound status was determined by responses to the question “How often do you get out of the house?” Those left the house once or less than once per week were classified as homebound.
Kono and Kanagawa 200114	Ten behaviors were asked and measured. Those who indicated that they had not left the house within the week prior to the interview were classified as being homebound.