Review Article

Access to Five Nonprimary Health Care Services by Homebound Older Adults: An Integrative Review

Home Health Care Management & Practice
1–15

DOI: 10.1177/1084822318810384
journals.sagepub.com/home/hhc
SAGE

Cynthia Sterling-Fox, PhD Student, MS, FNP-C, RN[1]

Abstract

Globally, the number of homebound older adults is rising exponentially as the aging population increases. Homebound older adults have complex medical and psychological issues for which many receive home-based primary care services. The purpose of this integrative review was to identify, analyze, and synthesize the existing literature regarding homebound older adults' need for, use of, and access to five nonprimary health care services. They are dental, nutritional, optical, pharmacy, and psychological services. The integrative review was conducted using a database search of CINAHL, Health Source: Nursing Education, PubMed, Medline, PsycINFO, and Cochrane, that was supplemented by a hand search. Little research was found addressing the five nonprimary health care services. Five themes emerged from the 10 studies. They were (1) complex and interrelated health problems require more health care services; (2) perceived unimportance of nonprimary health care services; (3) barriers to use of and access to nonprimary health care services; (4) the impact of socioeconomic and demographical factors on access to services; and (5) the impact of psychological factors (depression and social isolation) on the use and access to health care services. These findings suggest further inequity and barriers to health care services by homebound older adults. Future research is needed with nonprimary health care providers to examine the clinical outcomes and costs of providing the services to homebound older adults.

Keywords

homebound, home care, older adults, access to health care, interdisciplinary, interprofessional

Introduction

Globally, the number of homebound older adults is rising exponentially as the aging population increases.[1,2] In fact, the aging index or the elderly-child ratio in all developed countries, several European countries, and Japan is projected to far exceed 100.[2] In the United States, there were four million homebound older adults who receive primary care at home in 2016.[3] The homebound population is expected to rise as the aging population increases.[1] The Administration on Aging (AoA) reports that the population 65 years and older increased from 36.6 million in 2005 to 47.8 million in 2015 (a 30% increase) and is projected to more than double to 98 million in 2060.[4] In addition, the oldest old, or the members of the 85 years and older segment of the geriatric population, is projected to triple from 6.3 million in 2015 to 14.6 million in 2040.[4,5] Primary care services for many older adults are often provided in the home. As this number increases, there will be increased need not only for primary care services but also for nonprimary health care services.[6,7] While there is a growing number of homebound older adults, there is limited research on the homebound older adults' need for, use of, and access to nonprimary care services.[6,7] Examples of nonprimary care services include nutrition, dental, optical, pharmacy, and psychological health services.

In the United States, Europe, and Japan, homebound older adults were found to have inadequate nutrition,[8,9] poor dentition,[10,11] high prevalence of depression,[12-14] and improper use of prescription medications.[15,16] In addition, homebound older adults have complex and interrelated health problems,[17,18] substantial functional impairments, and high disease burden and care that prevent them from leaving their homes.[19] They also have higher morbidity rates,[20] use health services at higher rates than their non-homebound counterparts,[21] and are associated with markers of greater socioeconomic vulnerability.[22] Although many older adults prefer to remain living in their homes when they are facing limitations due to illness and disability,[21] the medical care of homebound patients in the United States is not well served by office-based primary care.[17] As a result, homebound patients get fragmented care.[23,24] Admittedly, there are variations in funding and administration systems in health care delivery across and within countries.[2] Case

[1]Cynthia Sterling-Fox, PhD Student, The Graduate Center, City University of New York, New York, NY, USA

Corresponding Author:
Cynthia Sterling-Fox, Assistant Professor, CUNY Medgar Evers College, 1638 Bedford Ave, AB-1 Bldg, Brooklyn, NY 11225, USA.
Email: csterlingfox@gradcenter.cuny.edu

management, integrated care, and consumer-directed care are some of the most popular health administration systems used in the United States and in other countries.[2] The evaluations of these systems also show variations in terms of clinical outcomes, service use, and satisfaction.[2] In the United States, to improve care for the vulnerable homebound, federally funded programs such as Medicare and Medicaid facilitate the provision of primary health care services in the patients' own homes.[25]

The health insurance needs of older adults are primarily covered by Medicare in the United States.[26] All homebound older adults, once certified by a physician, are covered by Medicare. However, Medicare part A covers none of the five nonprimary health care services of interest in this review. Medicare part B covers mental health care and most Medicare Advantage plans offer extra coverage, such as vision, hearing, dental, and/or health and wellness programs[26] in the community but not in the home. Globally, many home visiting programs were developed.[27] Specifically designed programs for homebound older adults were found to improve health and independence of older adults and reduce hospital and nursing home admissions.[17,27(p. 2)] Physician house call practices, once on the verge of extinction,[25] increased to Medicare beneficiaries as reimbursement improved with the changes in federal regulations.[28,29] In addition, the Patient Protection and Affordable Care Act (PPACA)[30] contained several measures that support physician home visits. For example, the Independence at Home (IAH) Act was included in the PPACA as a demonstration project with a new model of funding physician-led, home-based primary care.[31] IAH is a federally funded program administered by the American Academy of Home Care Medicine (AAHCM), which provides primary care in the homes of older adults with severe chronic illness and disabilities.[32,33] Other IAH programs help the older adults to "age in place," by providing care and assistance in the home and avoid the need for emergency services, hospitalizations, and nursing home stays.[33] Despite these changes, few subspecialists or non-primary care providers were found to provide home visits.[25(p. 867)]

The health care services of interest in this review are dental, nutrition, optical, pharmacist, and psychological services. These services were chosen because dental care[20,23] affects nutrition[20,21] and there is an association between vision[18,19] and polypharmacy[21] and depression and social isolation.[24] In fact, one study raises the possibility of a vicious cycle between depression, homebound status, and functional status.[34(p. 2362)] An understanding of the need for, use of, and access to these five nonprimary health care services by homebound older adults may uncover potential gaps in clinical practice. Therefore, the purpose of this integrative review is to identify, analyze, and synthesize the existing literature to determine the need for, use of, and access to the five nonprimary health care services by homebound older adults. For clarity, the review purpose was framed using two questions: (1) Do homebound older adults need the services of the dentist, nutritionist, ophthalmologist, pharmacist, and psychiatrist; and (2) Are the services of the dentist, nutritionist, ophthalmologist, pharmacist, and psychiatrist accessible to and used by homebound older adults? The terms homebound elder or elderly and homebound older adult are used interchangeably in the literature. For the purposes of this article, all terms were changed to older adult, the sociopolitically correct term, and is defined as a man or woman aged 50 years and older, who is unable to leave the home to obtain health care services in the community.

Methods

Data Sources and Search Strategy

The framework of Whittemore and Knafl[35] was used to guide and enhance the rigor of the review and to minimize bias in the evaluation of the various types of studies used in the review. A detailed literature search was conducted to identify all articles from 2000 to 2016 in the United States and other countries studying the five nonprimary health care services and need, use, or access by homebound older adults. First, an electronic database search was conducted using CINAHL, Health Source: Nursing Education Edition, PubMed, Medline, PsycINFO, and Cochrane. Also, a hand search was done of the gray literature, Google Scholar, Social Science Research Network (SSRN), and the reference lists of studies. The following key phrases or terms were used in various combination: adults, older adults, homebound, home-based, home care, health care services, access to health care services, dental, nutrition, optical, vision, psychiatric, psychological, mental health, and pharmacy.

Study Selection

The reviewer screened the abstracts and identified relevant articles. Relevant articles studied homebound older adults and at least one of the five nonprimary services of interest in the review. Articles were then selected for full review and the following information was extracted: authors, year, country, focus of the study, population sample and size, research design/methods, intervention phenomenon, outcomes measures, results, and limitation/critique.

Screening

The inclusion criteria included literature written in English from the United States and other countries to obtain a broader understanding of the issue of the homebound older adults and the health care services. The literature must have studied homebound older adults and one or more of the five health care services: dental, nutrition, vision, pharmacy, psychiatry. The search included citations, original research, peer-reviewed, and scholarly articles written in English from 2000 to 2016. Excluded from the studies were articles about older

Table 1. Inclusion and Exclusion Criteria and Limiters.

Inclusion criteria	Exclusion criteria
Literature focusing on: • homebound adults or elderly • health care services: dental, nutrition, vision, pharmacy, psychiatry Limiters • Population: Adults • Citations • Language: English • Dates: 2000 to 2016 • Publication type: original research, peer-reviewed, scholarly articles	Literature focusing on: • older adults or elderly temporarily homebound following acute illness • children • caregivers Other exclusion criteria: • written in language other than English • unable to extract data specific to homebound adults • unable to extract dataspecific to the five health care services of interest

adults who were temporarily homebound following acute illness, children, and caregivers and articles without data specific to homebound older adults and the five health care services of interest. See Table 1 for summary of inclusion and exclusion criteria.

Search Outcome

The results of the literature search, which yielded 997 nonduplicated records, are displayed in the PRISMA Flow Diagram (Figure 1). The methodological quality of the included studies was evaluated using the Bowling critical appraisal checklist.[36] A constant comparative approach was used to analyze the data.[35] In the first stage of this process, all data were extracted into summary tables (Table 2). The tables allowed for increased visualization of patterns and relationships within and across the data sources.[35] The results were then evaluated for similarities, differences, overlapping attributes, and finally for common themes. The summarization of the findings provided information about what was known about the need, use, and access of the five nonprimary health care services to homebound older adults.

Findings

Ten studies were included in the review. The studies were done in United States, Canada, Japan, and one study in Europe that included Denmark, Norway, Finland, Sweden, Germany, Italy, France, Netherlands, Czech Republic, and United Kingdom. All the studies were quantitative studies.[8-12,14,16,37-39] The studies varied in design and included cross-sectional, descriptive, observational, and longitudinal designs. Ninety percent of the participants in the studies were homebound and living in their private house or apartment.[19-21,23-27,29] Because of the dearth of research found on optical services for the homebound,[20,40,41] an original article that studied an optometrist-led eye care program for seniors in long-term care facilities and retirement homes was included.[37] Most of the participants were Canadians taking part in an international study on vision impairment with Denmark, Norway, Finland, Sweden, Germany, Italy, France, Netherlands, Czech Republic, and United Kingdom.[39(p. 1)]

Five themes were identified from the studies regarding the need, use of, and access to the dental, nutrition, optical, pharmacy, and psychological services for the homebound older adults. The themes are (1) complex and interrelated health problems require more health care services; (2) perceived unimportance of nonprimary health care services; (3) barriers to use of and access to nonprimary health care services; (4) the impact of socioeconomic and demographical factors on access to services; and (5) the impact of psychological factors (depression and social isolation) on the use of and access to health care services.

Complex and Interrelated Health Problems Need More Health Care Services

Homebound older adults have complex and interrelated health problems.[17(p. 2243)] They have poor dental care[10,38] and poor diet[11(pp. 717,718)] and vision decline.[37(p. 8),39(p. 1)] Polypharmacy[16] is also prevalent among homebound older adults as diabetes, heart disease, and lung disease, the three leading cause of death in the United States,[42] are prevalent among homebound older adults and require multiple drug combination (polypharmacy) for optimal management.[16(p. 721)] Homebound older adults use very high numbers of different therapeutic categories of medications, which affected health outcomes.[16(p. 722)] In like manner, one study found that not only polypharmacy, but also depression, increased emergency room calls, and hospitalization which were prevalent among homebound older adults who had recent vision decline (RVD).[39(p. 7)]

Perceived Unimportance of Nonprimary Health Care Services

Some homebound older adults do not perceive the need for some of the five nonprimary health care services in this review. For example, residents of the long-term care facility with poor vision declined the optometrist's referral to ophthalmologists because they did not perceive the importance for follow-up care.[37(p. 10)] Similarly, some homebound older adults did not utilize dental health services because of the low perceived need for dental treatment when compared with their need for other primary care services such as medical care.[11(p. 719)] Having money and dental insurance increased utilization of dental care services.[10(p. 760)] This perceived unimportance of health care services was noted too in homebound older adults with depression. For example, many depressed homebound

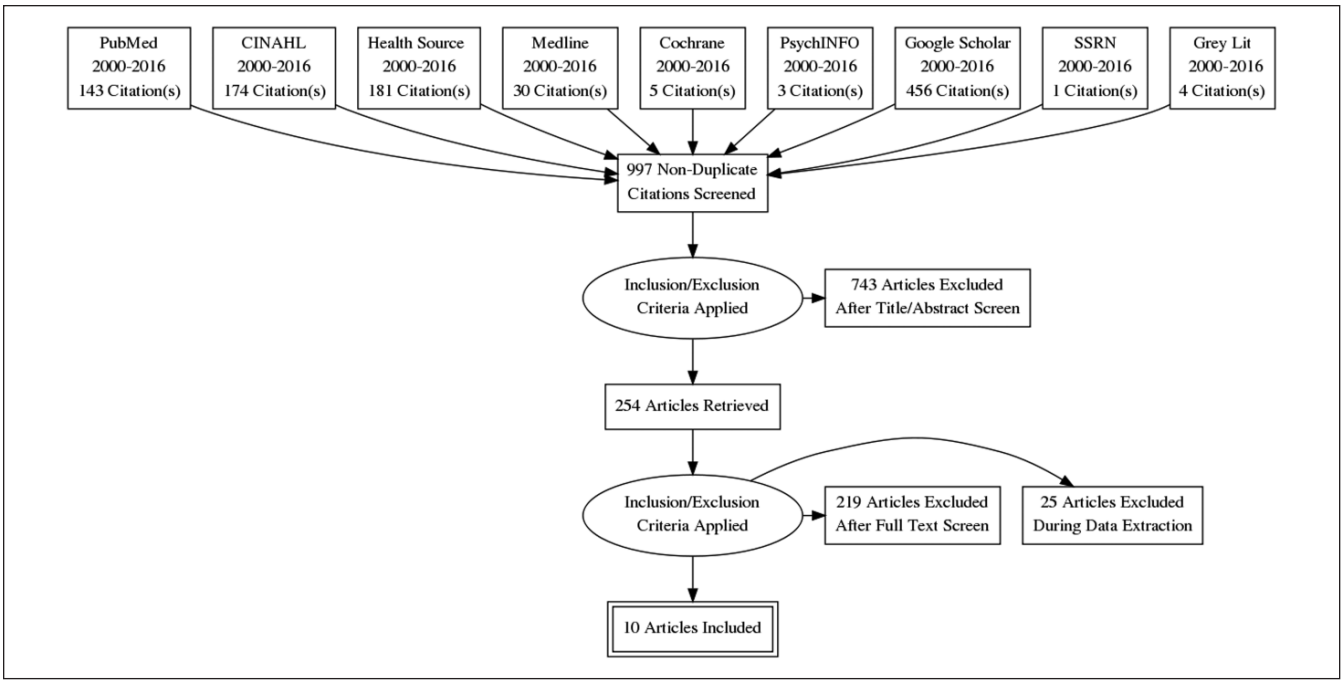

Figure 1. PRISMA Flow Diagram for Search and Selection Process *Note*. SSRN = Social Science Research Network.

older adults preferred to use prayer, passive coping, and watching television over seeking professional psychiatric or psychological help.[12(p. 318)]

Barriers to Use of and Access to Nonprimary Health Care Services

The review identified two types of barriers to use of and access to the nonprimary health care services: (1) the service is not available in the home or (2) the individual does not use the service. Seven out of the 10 studies reported that physical limitation, poverty, lack of finances, lack of insurance, and medical condition were barriers to using and accessing health care services.[10(p. 763),12(p. 310),16(p. 721),38(p. 10),40(p. 7)] For example, in the United States, 80% of the medical care is covered by Medicare. However, the homebound older adults with lack of finances often have difficulty in paying the remainder 20% of the medical bill.[10(p. 763),12(p. 319)] Barriers to the homebound older adults receiving dental and vision care included the inability to communicate due to cognitive impairment, embarrassment, fear of falling,[37(p. 10)] perceived unimportance of dental and vision care, and local logistical barriers to accessing care.[37(p. 10),38,39(p. 7)]

The Impact of Socioeconomic and Demographical Factors on Access to Services

The impact of socioeconomic and other demographical factors on the use nonprimary health care services was apparent in the review. Income, work, receiving food stamps or meals-on-wheels, living arrangement, and marital status influenced the use of nutritional, optical, and dental services.[8,9,39] For example, although home-delivered meals were regularly provided to homebound adults, it was reported that regardless of health-related factors, women had significantly lower intakes of protein, vitamins, and minerals and that blacks consumed significantly more protein, less calcium, folate, and magnesium. In the same study, lower intake of some nutrients was also associated with less education and lowest level of income.[9] Despite the enrollment of homebound older adults in Medicare and/or Medicaid or other employer insurance, many homebound older adults lack finances to obtain dental care,[9(p. 1435)] food,[8(p. 224)] and vision care, which are often not covered by insurance. Age, race, education, gender, and living arrangements were also noted to influence the use of nutritional services.[9]

The Impact of Psychological Factors (Depression and Social Isolation) on the Use and Access to Health Care Services

Several studies demonstrated that homebound older adults are vulnerable to depression, loneliness, and social isolation due to recent visual decline, inadequate nutrition, and depression.[9,12,39] Forty-two percent of all homebound older adults have depression.[14] In one study, almost 20% of the sample reported greater than seven of 15 depressive symptoms.[21] Despite the high prevalence of depression

Table 2. Summary of Characteristics of Studies Reviewed.

Author(s) year Country Journal Doi	Focus of study	Population sample	Research design/methods	Intervention phenomenon	Outcome measures	Results	Limitation/critique
1. Manski et al (2004) USA Dental insurance visits and expenditures among older adults *Am J of Public Health.* 2004;94(5):759-761 No doi	DENTAL/ORAL Examine aging population, decreased income, and dental care coverage and utilization	Aging population 4,272 participants aged 55 years and older (27% older than 75 years old) Lower income adults, middle-income, and upper income adults and homebound disabled	Data from 1996 MEPS sponsored by AHRQ Multivariate analyses to measure effect of income and age assoc dental coverage	None	Utilization of dental service	Dental insurance coverage, wealth, and poverty play role in dental care utilization Lower & middle-income adults w/o coverage less likely to access dental services than their upper income peers Homebound less likely to use dental services Mandatory fluoridation in 1940s-1950s in the United States leads to decline in edentulous adults (baby boomers) Dentate status over time may play less important role b/c elders not losing teeth prematurely Lower SES do not benefit from cohort shift Future research: evaluate the health service needs, demands, and financing of oral health services for older adults	Dentate status over time may play less important role b/c elders not losing teeth prematurely Homebound less likely to use dental services Dentate status over time may play less important role b/c elders not losing teeth prematurely
2. Gluzman et al (2013) USA Oral health status and needs of homebound elderly in an urban home-based primary care service *Spec Care Dentist.* 2013;33(5):218-226 doi:10.1111/j.1754-4505.2012.00316.x	DENTAL/ORAL To assess (1) dental, periodontal, soft tissue status, and denture status of MSVD patients; (2) distribute subjects' self-reported oral health problems; and (3) dental utilization, needs, and interest in home-based services	50 years and older Mean age: 81 years 334 eligible 125 participated 80% female Homebound	Descriptive Random sample of medically compromised homebound in NYC receiving services from MSVD program in their homes Surveys and questionnaires (oral health profile and geriatric oral health assessment) Descriptive statistics using PASW (SPSS) used for data analysis	Oral health exam	1. oral health problems 2. use of needs and interest in home-based services	76% (95) dentate 24% (30) edentulous Mean of three decayed teeth 40% of dentate needed filling, 45% needed extractions. 64 denture wearers No serious soft tissue damage found 96% never visited by dentist since becoming homebound 93% interested in home-based dental care	Limited number of oral health status and unmet needs done on homebound population Sample size small Fewer studies on homebound receiving palliative care

(continued)

Table 2. (continued)

Author(s) year Country Journal Doi	Focus of study	Population sample	Research design/methods	Intervention phenomenon	Outcome measures	Results	Limitation/critique
3. Sharkey et al (2002) USA Inadequate nutrient intakes among homebound elderly and their correlation with individual characteristics and health-related factors *Am J Clin Nutr*. 2002;76:1435-1445 No doi	NUTRITION Purpose to: 1. determine the extent of inadequate dietary intake of key nutrients among homebound elderly using new DRI 2. examine the associations of individual characteristics and HRFs with low nutrient intake	NAFS is a project between the School of Public Health at UNC and Older Americans Act Nutrition Program (home-delivered meals component) 348 homebound elderly Aged >60 years 18 excluded b/c no telephone 430 eligible 348 recruited 79 declined to participate Three hospitalized	Cross-sectional exam of data collected during baseline assessment of a prospective study of nutrition and function (NAFS) among randomly recruited sample of cognitively eligible recipients of home-delivered meals who completed three 24-hr dietary recall Inclusion: current home-delivered meals, aged >60 years; telephone-administered MMSE score >17/22 points; able to participate w/o proxy. Exclusion criteria: individuals without telephone Nutrient analysis using Nutrition Data System software Multiple regression models identified associations Data analyzed with STATA statistical software Nutrition Data System for Research software	Three nonconsecutive days of 24-hr dietary recall Nutrient analysis using Nutrition Data System software	Associations of individual characteristics and HRFs with low nutrient intake Individual characteristics: 1. age 2. race 3. education 4. income 5. marital status 6. living arrangement 7. receiving food stamps HRFs: 1. Physical characteristics: (1) burden of disease measured using method by Payette et al; (2) meds; (3) oral health status measured by Nutrition Screening Initiatives' Level II Screen and Oral Health Checklist; (4) chemosensory deficits: diminished sense of smell and taste; (5) physical limitation in meal preparation and consumption measured by nine questions measuring difficulty performing tasks associated with meal preparation and consumption; smoking status measured by "yes" or "no" 2. Psychosocial characteristics Five psychosocial measures: (1) depressive symptoms measured with 15-item GDS; (2) life stresses measured by sum of 10 life events; (3) subjective health (poor health) measured by 5-point Likert scale; (4) function by 5-point Likert scale; and (5) vision by 5-point Likert scale 3. Meal patterns Breakfast consumption measured by frequency of breakfast on 3-point scale 4. Current nutritional health status Measured by BMI with knee height as indicator for original height for subjects unable to stand	1. Almost 20% of sample reported >7 of 15 depressive symptoms; 25% experience life stress events the previous year and 37% had major financial difficulty, 45% had given up a hobby or activity; 40% had a new illness. 2. Frequency of breakfast consumption increased with age; 3. BMI in white lower than in blacks; 4. Magnesium, Vitamin E, and Zinc were inadequate in majority of subjects. 95.6% failed to consume adequate Calcium 5. HRF: diminished sense of taste, physical limitations in meal preparation and consumption, and breakfast consumption were significantly correlated with nutrient intakes 6. Lowest level of income and education directly associated with lower intakes of nutrients 7. Women had lower intakes of nutrients 8. Blacks consumed significantly more protein.	Cross-sectional design allowed examination of HRF and nutrient intake. However, unable to make causal inferences All participants had meals on wheels. However, when exclusion criteria (persons with no telephone) are omitted, it is possible that study sample differed from other participants Study relied on self-reporting rather than objective measures of oral health status Need: home-delivered meals should target at-risk groups with interventions to increase nutrient intake Breakfast should be made available Meals should be customized to the needs of the recipients (palatability, tastes, and preferences)

(continued)

Table 2. (continued)

Author(s) year Country Journal Doi	Focus of study	Population sample	Research design/methods	Intervention phenomenon	Outcome measures	Results	Limitation/critique
4. Locher et al (2008) USA A multidimensional approach to understanding under-eating in homebound older adults: the importance of social factors *The Gerontologist.* 2008;48(2):223-234 No doi	NUTRITION Examine the relationships between under-eating and these factors: medical, functional, economic, oral health, social, religious, and psychological	230 homebound older adults Age Interviews Questionnaires	Descriptive statistics, chi-square analysis, one-way analyses of variance, binary logistic regression Underweight: questionnaires Height & weight (3) 24-hr recall; 1 face-to-face, and 2 on phone Med: Charlson Comorbidity Index Questionnaire Function: mobility, vision, hearing re meal prep/eating by 3 OASIS questions Econ: USDA abbreviated Six-Item Subset of the US Household Food Security Oral: oral health-related quality of life measure & count of teeth Social factors: marital status, living arrangement, and Medical Outcomes Study Social Support Survey Religious: multidimensional measurement of religiousness/spirituality for use in health research Psychological: Cognition: MMSE; Depression: Scale by Mirowsky and Ross	None	DV: under-eating = not consuming enough calories to maintain current body weight EER: daily caloric intake IV: factors related to under-eating: medical, functional, economic, oral health, social religious, psychological	70% of participants were under-eating High-risk participants: men Those receiving infrequent care or very frequent care by caregiver, hospitalized, higher BMI Under-eating associated with younger age, male gender, AA, low-level education, hospitalized, low score on support scale, female caregiver, daughter, religious practices, higher BMI, functionality, and well-being of caregiver Participants receiving more care under-eat (Under-eating for health reasons?) Predictor of greater caloric intake: presence of others during meal (companionship); help with meal preparation Solutions: virtual family dining (telephone, web-cam) Interventions designed to increase caloric intake post-discharge from hospital, case management, post-discharge planning Other researchers: Older homebound women at nutritional risk, increased with social isolation, limited finances, and no transportation (Sharkey et al[9]). Policy change: Medicare emphasis is on acute care leaves homebound w/o adequate services (IOM 2011/Nutrit & health of nation's elderly) Education: Medicare Health Support—self-care education and family & caregiver education.	Small sample size Reliance on self-reporting for dietary intake and height and weight for others not other objective measures Self-reporting for obese participants may have lead to overestimates of under-eating No measures of body composition or fluid status used Implication for Practice Caregivers sit with at-risk population Future Research/Gap Programs: specifically designed for homebound that accounts for gender, ethnicity

(continued)

Table 2. (continued)

Author(s) year Country Journal Doi	Focus of study	Population sample	Research design/methods	Intervention phenomenon	Outcome measures	Results	Limitation/critique
5. Grue et al (2010) Norway Recent visual decline—a health hazard with consequences for social life: a study of home care clients in 12 countries *Curr Gerontol Geriatr Res.* 2010;2010: 503817 doi:10.1155/2010/503817	VISION Purpose is to investigate older adults at home to determine the prevalence of recent vs. SVI and whether recent worsening of vision or RVD was associated with changes in social activity; limits of going out due to fear of falling; and IADL loss	106,514 participants >65 years receiving home care Canada—101,618 Finland—1,103 10 European countries—3,793 (Denmark, Norway, Finland, Sweden, Germany, Italy, France, the Netherlands, Czech Republic, United Kingdom) Excluded—participants with severe dementia; living institution-like setting, below age 65 years	Observational, prospective Quantitative study in multi-country Excluded—participants with severe dementia; living institution-like setting, below age 65 years Measurement used: Ontario RAI-HC database RAI-HC validated and tested for reliability. Consists of 20 domains and 300 clinical items including sociodemographic, physical, mental function, medical, environmental, and services Informed consent Ethics approval	Use of RAI-HC to 1. determine prevalence of visual impairment and recent visual impairment 2. association between RVD and (a) social life, (b) limits of going outdoors due to fear of falling, (c) IADL	1. Prevalence of visual impairment and recent visual impairment 2. Association between RVD and (a) social life, (b) limits of going outdoors due to fear of falling, (c) instrumental activities of daily living	Recent visual decline common among Female gender and living alone associated with RVD compare to client w/o visual impairment or SVI Prevalence of visual decline (W/I 90 days) high; between 5.9% and 49.3% RVD have more severe consequences than SVI Cataract and glaucoma were more common when RVD present RVD has significant impact on the social life and function of older adults Older persons with RVD have more functional problems and are less socially active than those with SVI RVD was independently associated with change in social activities (difficulty orienting to environment, embarrassment, fear of falling) Indicators of poor health more common in polypharmacy, depression, ER calls, recent hospitalization more common with RVD RVD subjects received more informal help and home making help but not more formal personal services (VN and home caregivers) than SVI Visual impairment (RVD and SVI) independently associated with loss of IADL Nursing Implication Aware of RVD and consequences and help patients receive proper assessments, treatment and rehabilitation Provide information to Informal caregivers Future/Gaps Battery of tests needed to detect visual impairments in other studies instead of reading test Future studies on whether proper assessments, treatment, and rehabilitation will reduce impact on social activity, fear of falling, and loss of IADL	No way to determine whether RVD was worst than previous Questionable validity as researchers used proxy information

(continued)

Table 2. (continued)

Author(s) year Country Journal Doi	Focus of study	Population sample	Research design/methods	Intervention phenomenon	Outcome measures	Results	Limitation/critique
DENTAL							
6. Sharkey et al (2005) USA ORIGINAL RESEARCH Patterns of therapeutic prescription medication category use among community-dwelling homebound older adults *Pharmacoepidemiol Drug Saf.* 2005;14(10):715-723 doi:10.1002/pds.1066	PHARMACY 1. To document the distribution of sociodemographic characteristics and medical conditions across levels of therapeutic prescription medication category use among homebound older adults and 2. Identify the factors associated with increasing use of multiple therapeutic categories	326 homebound elders 60 years and older homebound adults Score >16 on MMSE, ability to answer questions w/o proxy	Multiple-year project between the School of Public Health at UNC and Older Americans Act Nutrition Programs home-delivered meal service 4 counties in NC Score >16 on MMSE, ability of answer questions w/o proxy 345 participants Informed consent IRB approval Data from baseline in-home assessment conducted from 326 elders who completed med review of baseline in-homes interview 19 participants excluded 16 did not regularly use >1 prescription 3 unable to provide meds for visual inspection	Med use—actual med containers for prescription meds taken. Container visually inspected. Categorized by therapeutic & subclass per American Hospital Form Service, 2002. Low/mod, high, very high. Sociodemographic race, gender, marital status, living arrangement, education, income Categorized as no med coverage, Medicaid, med insurance, VA pharmacy benefits Medical condition—if MD told them they had either of 10 medical conditions Statistical Analysis—using STATA statistical software Multivariate logistic regression model for all IV with ordinal polychotomous DV for used of increasing number of therapeutic prescription med categories CI 95%	Categorized by therapeutic & subclass per American Hospital Form Service, 2002. Low/mod, high, very high Categorized as no med coverage, Medicaid, med insurance, VA pharmacy benefits 10 medical conditions: arthritis, cancer, CHF, diabetes, heart disease, HTN, kidney disease, lung disease, osteoporosis or stroke	Mean number of diff prescription meds taken daily was 6.4 ± 4.2 (median 6, range 1-29, mean 3.7 ± 1.9 Age & specific medical condition and comorbidity were associated with increasing therapeutic category use Inverse relationship with age: 60-74 and 75-84 were 3 and 2.3 times more likely than those 85 years and older to use prescription meds from greater number of different therapeutic categories Prevalence of use of prescribed respiratory med decline with increasing age Patterns of med use varied among age and gender: Calcium Channel Blockers/Alpha-Adrenergic Antagonists most frequently used for men. Diuretic for women. 79% of the sample use anti-psychotic or anti-depression meds Women mostly used diuretic and thyroid meds Widespread use of high numbers of different therapeutic categories found among homebound older adults: 72% used prescription meds from at least 3 different therapeutic categories More than 31% used from at least 5 different therapeutic categories Sociodemographic characteristics and specific medical conditions associated with utilization of prescription med from increasing number of therapeutic categories: Inverse relationship between age and multiple therapeutic medication categories Diabetes, heart disease, and lung disease were the three conditions with highest disease burden and greatest requirements for combo drug use. Med insurance is associated with increased med use.	Did not document level of personal assistance from others with med management Cross-sectional design prevents causal or temporal inferences Observations may note representative of homebound populations in other regions of the United States. Unable to describe the number of prescribers, pharmacies used, dose levels, which meds were a short course, adherence or adverse events Data on nonprescription med not included Implication to Practice: Providers of services to older persons need to be aware of difference in therapeutic med use within this population and how patters of use may alter service needs The use of multiple therapeutic prescription *med categories* to describe patterns of med use merit inclusion in future studies Future Research: Longitudinal studies among homebound elders to determine the predictors of increased med use; how med used and med coverage influence each other; how change in coverage affects patterns of med use; How med patterns affect burden of disease and QOL How multiple categories of medications are associate with health and QOL outcomes

(continued)

Table 2. (continued)

Author(s) year Country Journal Doi	Focus of study	Population sample	Research design/methods	Intervention phenomenon	Outcome measures	Results	Limitation/critique
7. Choi et al (2007) USA ORIGINAL ARTICLE Comparison of depressive symptoms between homebound older adults and ambulatory older adults *Aging Ment Health*. 2007;11(3):310-322 doi:10.1080/1360786060084461 4	DEPRESSION To examine whether homebound older adults are likely to self-report more depressive symptoms than ambulatory peers To examine whether social support, religiousness, and physical exercise mitigate relationships among homebound status, health and psychosocial risk factors and depressive symptoms	81 homebound elders; aged 60 to 96 years from home-delivered meals from MOW program 130 senior center participants; aged 60 to 89 years 12 Spanish Average age of homebound person was 76.2 and 71.9 years for senior center group 42% of homebound aged 80 years and older and 16.9% of senior center	Cross-sectional study 156 of 1,399 (11.3%) MOW clients met inclusion criteria Inclusion: cognitively intact, physical able to engage in face-to-face interview for 1-1.5 hr 81 of 156 interviewed 26 unable to contact 23 to weak for interview 10 no interest 3 hearing or speech problem Depressive symptoms measured by 15-item GDS Coping resources measured by 18-item Lubben Social Network Scale (LSNS) Lazarus and Foldman's stress-coping model to examine relationship among life stressors, coping resources and depressive symptoms Data analysis using: bivariate and multivariate analyses, OLS regression models, negative binomial regression analysis (suing STATA 9),	Face to face interviews Questionnaires Depressive symptoms measured by 15-item GDS Coping resources measured by 18-item LSNS Lazarus and Foldman's stress-coping model to examine relationship among life stressors, coping resources and depressive symptoms	Depressive symptoms using GDS Sociodemographic using age; race/ethnicity (AA, Hispanic); non-Hispanic white; gender; level of education; financial situation; Health-related stressors 9 medical condition: arthritis; HTN; DM; diseases of heart & lung; cancer; stroke; kidney; liver disease. ADLs: toilet, dressing, hair, in/out of bed IADLs: telephone, meals prep, shopping, house work, taking meds, managing money Other Life Stressors: Checklist of stressful life events: children leaving home, illness, robbed, new family member, death of spouse/family/friend Checklist of serious problems: not enough money, caring for sick, conflicts in family, loneliness, dependence on others Coping resources: level of social support using LSNS. Religiousness Physical exercise Self-reported coping strategies	42% of the homebound group and 13% of senior center participants scored 5 or higher on GDS Praying and passive coping; TV was more prevalent than professional help-seeking for both groups High prevalence of depression among homebound older adults: 24.2% of all study sample and 42% of homebound group Senior centers group has lower harmful effect of stresses in later life (b/c they have access to nutritional, social recreational, educational, and health-related programs) Homebound adult more likely to be socially isolated than those at senior citizen Loneliness correlates with depressive symptoms Health problems, disability, lack of money listed at the reason for not being able to go out much and do things Financial situation, physical and functional health problems, and loneliness are significant correlates of depressive symptoms (when social support, religiousness, and physical exercise added to multivariate regression model) Coping resources buffered the effect of the homebound state on depressive symptoms. Neither frequency of attendance at religious services or praying as coping strategy was significantly directly associate with depressive symptoms Praying not found to be independently correlated with depressive symptoms Engagement in moderate or vigorous exercise at least 3 to 4 times per week was found to be directly significantly correlated with lower depressive symptoms for all respondents	My opinion: The researchers did not explicitly list limitations of the study Researchers are a social worker and nurse. No implications for nursing practice Yes implications and suggestions for social work practice and programmatic change Cross-sectional studies so no causal direction between exercise and depressive symptoms established

(continued)

Table 2. (continued)

Author(s) year Country Journal Doi	Focus of study	Population sample	Research design/methods	Intervention phenomenon	Outcome measures	Results	Limitation/critique
8. Choi et al (2012) USA Relationship between depressive symptom severity and emergency department use among low-income, depressed homebound older adults aged 50 years and older *BMC Psychiatry*. 2012;12:233 doi:10.1186/1471-244X-12-233	DEPRESSION To examine whether 1. depressive symptom severity was associated with the frequency of ED visits at two different points of time among low-income, depressed homebound older adults aged 50 years and older 2. changes in depressive symptoms severity over time were associated with the changes in the frequency of ED visits and return visits. Hypotheses: 1. Higher depressive symptoms at baseline would be associated with higher frequency of ED visits during the 6 months prior to baseline 2. higher depressive at 24 weeks f/u would be associated with higher frequency of ED visits during the 24 weeks after baseline 3. reduced depressive symptoms 24 weeks after baseline would be significantly associated with a lower frequency of ED visits during that period (controlling for baseline number of ED visits and predisposing, enabling and other needs factors)	124 out of 186 referrals met inclusion criteria 121 agreed to participate Subjects are residents of Central Texas who participated in a RCT of short-term psychotherapy for low-income homebound older adults with moderately severe or severe depressive symptoms at baseline. Ages 50 years and older Inclusion: score of 10 or higher on PHQ-9 or showed signs of depression' HAMD score of 15 or greater Exclusion: high risk suicide; dementia; bipolar disorder; 12-month or lifetime psychotic symptoms or disorder; presence of co-occurring alcohol and/or other addictive substance abuse; current involvement in psychotherapy	Longitudinal study to examine relationship between depressive symptoms and the frequency of ED visits Case managers at MOW program referred participants. Informed consent IRB approval Participants were administered 24-item HAMD and the *DSM-IV-TR* diagnostic interviews for depression Randomly assigned to three groups; telehealth-delivered PST; in per PST ad telephone support calls 14 dropped out during intervention phase 11 dropped out during the f/u period 15 did not complete their 12-week f/u assessment 25 did not complete their 24 week f/u assessment Attrition was due to deteriorating health, nursing home placement, death	Baseline data collected at 3 assessment points at baseline, 12-week and 24-week f/us. At baseline, they were asked to report ED visits during the preceding 6 months At 12-week f/u, they reported the visits since baseline At 24-week f/u, they reported ED visit since 12-week f/u. The sum of ED visits between baseline and 24-week f/u	ED visits The number of and reasons for ED visits at all assessment points; at baseline: preceding 6 months; at 12-week: ED visits since baseline; at 24-week f/u: ED visits since the 12-week f/u. All ED visits were added. Predisposing factors: gender; age (50-50, 60-60, 70+) Enabling factors: Medicaid coverage (yes = 1, no = 0); family support using LSNS-E Need factor: Depressive symptoms Measured with 24-item HAMD with 3 additional items assessing feeling of hopelessness, helplessness, and worthlessness Other need factors: The no. of diagnosed chronic medical conditions Measure by questions at baseline: diagnosed by health care professional with arthritis, HTN, DM, heart disease, stroke, lung disease, cancer, and kidney disease. Is condition still a problem	59% AA and 84.4% Hispanic had annual income of <$25,000 Average 3 medical condition All had PCP 91.7% enrolled in Medicare and/or Medicaid and 5% VA or employer insurance 67% of subjects used ED at least once during the approx 12-month study 61% of ED visitors made at least one f/u visit during the 12-month visit Self-reported reason for ED visit was pain relief, poor self-care Finding support Hypotheses 1 and 2: ED visit frequency was significantly associated with higher depressive symptoms at both baseline and at 24-week f/u Subjects with comorbid multiple medical conditions and depression felt urgency to seek emergency medical care for symptoms that might be managed in a PCP office Finding support Hypothesis 3: the relationship between ED visit frequency at f/u and HAMD score changes sine baseline 50-59 age group had significantly more ED visits at both baseline and f/u than the 70+ age group ED use increased by younger group b/c of lack of Medicare coverage 100% 70+ had Medicare and 73% of 50-59 and 71% of 60-69 age group Medical conditions and level of disability was not significant correlation of ED visit Hispanics used the ED at baseline but not at f/u Hispanics self-care knowledge and skills was lower than that of other participants at baseline Hispanics with DM education used ED less than those without DM education	Limitation: Self-reported ED visit data not validated against the subject's medical record ED visit rate much higher than those reported in other studies Reasons for ED visit rate not validated against the discharge diagnoses The 24-item HAMD cutoff score of 15 was not validated Sample size was too small to generalize the findings to other group of homebound adults Implications: Need for better education on self-management of chronic conditions PCP and EDs may use ED visits as cue for depression screening Depression treatment including symptom management and PST important in reducing ED visit rates Effective pain management Clinicians should educate homebound older adults on relationship between pain management and depressive symptoms Further research: Identify factors contributing to higher ED use by those who are below 70 years
9. Morishita et al (2001) Japan Oral health care status of homebound elderly in Japan *J Oral Rehabil*. 2001;28(8):717-720 No doi	DENTAL/ORAL Assess and clarify the needs of oral health care for homebound elderly Determine relationship between general conditions of the subjects and oral health status Determine the independence of daily oral hygiene on oral health care (oral hygiene, eating, drinking, dental treatment	668 homebound elderly (211 male; 450 females, 7 no answer) Response rate 73.6% Age: 65 years and older	Cross-sectional study; Surveys; Spearman's rank correlation coefficient	Questionnaire completed by 668 homebound elderly or their caregivers	Answers provided information with respect to general condition of the subjects as assessed by ADL; independence of daily oral hygiene and meal; use of dentures; diet and; use of dental treatment	Daily oral health care not adequate: caregivers old (mean 61 years) and heavy burden of care. Oral health care is considered less important than other medical care General condition of subjects had direct correlation to quality of oral hygiene and better diet High rate of edentulism, caries, periodontal disease among homebound Utilization in homebound is limited because of low perceived need for dental treatment; fear; and lack of transportation Homebound desired domiciliary dental service Future Research: to study effective measures of domiciliary dental service and community service for the homebound	Oral health care included daily oral hygiene support, eating, drinking support, and support to receive dental treatment General condition of the subjects was related to the quality of oral health care such as tooth-brushing and diet. 4.5% replied that they did not need any dental treatment Many studies show high rate of edentulism, carries, poor oral hygiene, periodontal disease and soft tissue lesion among homebound or nursing home elderly subjects Real demand for dental treatment of the homebound might be higher than reported in the study

(continued)

Table 2. (continued)

Author(s) year Country Journal Doi	Focus of study	Population sample	Research design/methods	Intervention phenomenon	Outcome measures	Results	Limitation/critique
10. Labreche et al (2011) Canada ORIGINAL RESEARCH An optometrist-led eye care program for older residents of retirement homes and long-term care facilities *Can Geriatr J*. 2011;14(1):8-11 No doi	Describes the optometrist-led eye care program for residents in institutional settings	91 residents Mean (SD) age 87.0 years 72 women; 19 women (Homebound) Could not easily leave the facility or found easier to assess at home Setting: 4 LTC and 2 retirement homes and 2 combined facilities		Comprehensive initial eye exam F/U care	Observational No informed consent as care considered "usual care." Study received clearance from, Office on Research Ethics at University of Waterloo (IRB in the United States) Portable equipment used	Residents of LTC: had more than one ocular condition/disease presented greater clinical challenges than those from retirement homes Cataract leading ocular condition/disease (59.3%) Aged-related macular degeneration (41.8%); Glaucoma (27.5%) Mean number of eye conditions/disease was 1.8 Challenges/barriers: Communication	Cognitive impairment, confusion, comprehension, lack of response provided challenges to provision of care Difficulty to complete the examination Involvement of family members necessary Homebound adults need vision service

Note. MEPS = Medical Expenditure Panel Survey; AHRQ = Agency for Health Research and Quality; SES = socioeconomic status; MSVD =Mount Sinai Visiting Doctors ; NYC = New York City; DRI =Dietary Reference Intake ; NAFS = Nutrition and Function Study; UNC = University of North Carolina at Chapel Hill; MMSE = Mini-Mental State Exam; HRF = health-related factor; GDS = Geriatric Depression Scale; BMI = body mass index; OASIS = Outcome and Assessment Information Set ; USDA = United States Department of Agriculture; DV =dependent variable ; EER = Estimated Energy Requirement ; IV =independet variable ; AA = African American ; SVI = stable vision impairment; RVD = recent vision decline; IADLs = instrumental activities of daily living; RAI-HC =Resident Assessment Instruments for home care ; ER = emergency room; VN = visiting nurse ; NC = North Carolina; IRB = institutional review board; VA = veterans affairs; CI = confidence interval; CHF = congestive heart failure; HTN = hypertension; QOL = quality of life; MOW = Meals on Wheels; ADLs = activities of daily living; LSNS = Lubben Social Network Scale; LSNS-E = Lubben Social Network Scale–Expanded; OLS = ordinary least square; DM =diabetes mellitus ; ED = emergency department; f/u = follow-up; RCT = randomized controlled trial; PHQ = Patient Health Questionnaire; HAMD = Hamilton Rating Scale for Depression; *DSM-IV-TR* = *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.); PST = problem-solving therapy; PCP = primary care physician; LTC = long-term care.

among homebound older adults, many prefer to pray and watch television to deal with depression over seeking professional psychiatric or psychological help.[12] Furthermore, it was noted that low-income older homebound individuals with severe depression had increased number of emergency department visits.[14]

Discussion

This integrative review of the literature was conducted to identify, analyze, and synthesize the existing literature to determine the need for, use of, and access to the five nonprimary health care services by homebound older adults. The nonprimary health care services were dental, nutrition, vision, pharmacy, and psychological services. The services were chosen because of the association between them. Although there is an abundance of literature on homebound older adults, there is a dearth of research articles on the homebound older adults' need, use, and access to these five specific nonprimary health care services. This review shows that poor dentition[10,11,38] in homebound older adults is associated with under-eating,[9] and increased burden of disease and care.[10,11] Increased disease symptoms are associated with hospitalization and polypharmacy.[18] There is also an association with vision decline and social isolation[37,39] Finally, social isolation is associated with worsening depressive symptoms[12] and under-eating.[9] An association is noted between and among the five nonprimary care health services. Indeed, a vicious cycle is noted. To achieve optimal health and well-being for homebound older adults, one must interrupt the cycle by improving access to nonprimary health care services in the home for this vulnerable population. Although evidence of effective intervention to improve access to nonprimary health care services is limited,[43] it is important for achieving equity of care through interventions that address social and health determinants.[43(p. 19)]

Limitations

This integrative review has several limitations. One huge challenge in conducting this review on homebound older adults was the lack of a precise definition of "homebound."[40(p. 445)] For example, epidemiological researchers often identify homebound individuals by self-report without regard to the assessed functional or cognitive capacity of the individual.[20] In the United States, Medicare defines homebound for the purpose of receiving home health benefit.[44] In the definition, the physician must certify that the individual is

> confined to his/her home because of illnesses, need the aid of supportive devices such as crutches, canes, wheelchairs, and walkers; use special transportation; or the assistance of another person to leave their place of residence; or have a condition such that leaving his or her home is medically contraindicated.[44]

Furthermore, in countries like Israel and Japan, homebound is defined from a screening survey question querying how many times a person leaves the home.[29(p. 14)] The lack of consensus on the definition of homebound makes integrative reviews challenging, as homebound population may include individuals at different levels of being homebound.[20(p. 2)] A concept analysis of homebound could not be found. A concept analysis is needed to guide future research on the homebound.

In addition, although there is an abundance of research studies on home-based primary care for the homebound older adults, research studies addressing the homebound older adults' need for, use of, and access to home-based dental care, optical care, nutrition, pharmacy, and psychological services were limited.[20,40,41] There was a dearth of research studies on home-based vision care. For this reason, a study on an optometrist-led eye care program that compared residents in long-term care and retirement homes was included.[37] In summary, although there is an awareness of the global increase in the aging population, who may unavoidably become homebound, there is lack of studies that relates specifically to the homebound older adults' need for, use of, and access to home-based dental, nutrition, optical, pharmacy, and psychological services.

Conclusion

The review, barring the limitations mentioned above, demonstrates that homebound older adults need but do not routinely have access to a dental, optical, and psychological health care services. Although many homebound older adults in the review had access to home delivery of meals, the literature reviewed made no mention of home visits by a nutritionist for educational purposes. Likewise, homebound older adults use home delivery of medications. However, despite polypharmacy and its effect on clinical outcomes, no literature illustrating patient education in the home by pharmacists was found. More studies are needed of this growing vulnerable population. The five themes uncovered in this integrative review suggest further inequity and barriers to health care services. Future research involving the nonprimary health care providers of the five health care services reviewed for homebound adults is needed. The effectiveness of providing these services in the home needs further research. Both the clinical outcomes and the costs of providing nonprimary health care access to homebound older adults need further investigation. The results of these investigations will inform policy makers regarding the provision of nonprimary health care services in the home from a financial, medical, and interprofessional health care perspective.

Acknowledgments

The author thanks the following faculty at the Ph.D. in Nursing Science program at The Graduate Center, City University of New York for their encouragement, support, and guidance: Dr. Jennifer Dine, my professor in Writing for Publication course, Dr. Eileen

Gigliotti, my advisor, , and Dr. Elizabeth Capezuti, my mentor, advisor and dissertation chair.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

ORCID iD


Cynthia Sterling-Fox https://orcid.org/0000-0003-0306-5988

References

1. Population Aging. Date unknown. http://longevity-science.org/Population_Aging.htm. Accessed September 23, 2018.
2. Low L-F, Yap M, Brodaty H. A systematic review of different models of home and community care services for older persons. *BMC Health Serv Res*. 2011;11:93-93. doi:10.1186/1472-6963-11-93.
3. Leff B, Carlson CM, Saliba D, Ritchie C. The invisible homebound: setting quality-of-care standards for home-based primary and palliative care. *Health Aff Proj Hope*. 2015;34(1):21-29. doi:10.1377/hlthaff.2014.1008.
4. *A Profile of Older Americans: 2016*. Date unknown. https://www.giaging.org/documents/A_Profile_of_Older_Americans__2016.pdf. Accessed September 9, 2017.
5. Bureau UC. *An Aging Nation: The Older Population in the United States*. https://www.census.gov/library/publications/2014/demo/p25-1140.html. Published May, 2014. Accessed September 23, 2018.
6. Musich S, Wang SS, Hawkins K, Yeh CS. Homebound older adults: Prevalence, characteristics, health care utilization and quality of care. *Geriatric Nursing*. 2015;36(6):445-450. doi:10.1016/j.gerinurse.2015.06.013.
7. Centers for Medicare & Medicaid Services. *Medicare Utilization Section*. https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/CMSProgramStatistics/2016/2016_Utilization.html. Published June 14, 2018. Accessed September 23, 2018.
8. Locher JL, Ritchie CS, Robinson CO, Roth DL, Smith West D, Burgio KL. A multidimensional approach to understanding under-eating in homebound older adults: the importance of social factors. *Gerontologist*. 2008;48(2):223-234. doi:10.1093/geront/48.2.223.
9. Sharkey JR, Branch LG, Zohoori N, Giuliani C, Busby-Whitehead J, Haines PS. Inadequate nutrient intakes among homebound elderly and their correlation with individual characteristics and health-related factors. *Am J Clin Nutr*. 2002;76(6):1435-1445. http://ajcn.nutrition.org/content/76/6/1435. Published December 1, 2002. Accessed September 15, 2017.
10. Manski RJ, Goodman HS, Reid BC, Macek MD. Dental insurance visits and expenditures among older adults. *Am J Public Health*. 2004;94(5):759-764. *Date unknown*. http://search.ebscohost.com/login.aspx?direct=true&db=hch&AN=12988701&site=ehost-live. Accessed October 20, 2018.
11. Morishita M, Takaesu Y, Miyatake K, Shinsho F, Fujioka M. Oral health care status of homebound elderly in Japan. *J Oral Rehabil*. 2001;28(8):717-720. doi:10.1046/j.1365-2842.2001.00713.x.
12. Choi NG, McDougall GJ. Comparison of depressive symptoms between homebound older adults and ambulatory older adults. *Aging Ment Health*. 2007;11(3):310-322. *Date unknown*. http://search.ebscohost.com/login.aspx?direct=true&db=mdc&AN=17558582&site=ehost-live. Accessed October 20, 2018.
13. Choi NG, Morrow-Howell N. Low-income older adults' acceptance of depression treatments: examination of within-group differences. *Aging Ment Health*. 2007;11(4):423-433. Date unknown. http://search.ebscohost.com/login.aspx?direct=true&db=ccm&AN=106011458&site=ehost-live. Accessed October 20, 2018.
14. Choi NG, Marti CN, Bruce ML, Kunik ME. Relationship between depressive symptom severity and emergency department use among low-income, depressed homebound older adults aged 50 years and older. *BMC Psychiatry*. 2012;12:233-233. doi:10.1186/1471-244X-12-233.
15. Chan D, Hao Y, Wu S.Polypharmacy among disabled Taiwanese elderly: a longitudinal observational study. *Drugs Aging*. 2009;26(4):345-354. *Date unknown*. http://search.ebscohost.com/login.aspx?direct=true&db=ccm&AN=105359722&site=ehost-live. Accessed October 20, 2018.
16. Sharkey JR, Browne B, Ory MG, Wang S. Patterns of therapeutic prescription medication category use among community-dwelling homebound older adults. *Pharmacoepidemiol Drug Saf*. 2005;14(10):715-723. doi:10.1002/pds.1066.
17. Stall N, Nowaczynski M, Sinha SK. Systematic review of outcomes from home-based primary care programs for homebound older adults. *J Am Geriatr Soc*. 2014;62(12):2243-2251. doi:10.1111/jgs.13088.
18. Wajnberg A, Ornstein K, Zhang M, Smith KL, Soriano T. Symptom burden in chronically ill homebound individuals. *J Am Geriatr Soc*. 2013;61(1):126-131. doi:10.1111/jgs.12038.
19. Ornstein KA, Leff B, Covinsky K, et al. The epidemiology of the homebound in the United States. *JAMA Intern Med*. 2015;175(7):1180-1186. doi:10.1001/jamainternmed.2015.1849.
20. Qiu WQ, Dean M, Liu T, et al. Physical and mental health of the homebound elderly: an overlooked population. *J Am Geriatr Soc*. 2010;58(12):2423-2428. doi:10.1111/j.1532-5415.2010.03161.x.
21. Reder S, Hedrick S, Guihan M, Miller S. Barriers to home and community-based service referrals: the physician's role. *Gerontol Geriatr Educ*. 2009;30:21-33. doi:10.1080/02701960802690241.
22. Landers SH. Home care: a key to the future of family Medicine? *Ann Fam Med*. 2006;4(4):366-368. doi:10.1370/afm.550.
23. Fine M. Community-based services and the fragmentation of provision: a case study of home and community care services in a suburban community. *Aust J Soc Issues*. 1995;30(2):143-161. doi:10.1002/j.1839-4655.1995.tb01032.x.
24. Clarfield AM, Bergman H, Kane R. Fragmentation of care for frail older people—an international problem. Experience from three countries: Israel, Canada, and the United States. *J Am Geriatr Soc*. 2001;49(12):1714-1721. doi:10.1046/j.1532-5415.2001.49285.x.
25. Peterson LE, Landers SH, Bazemore A. Trends in physician house calls to Medicare beneficiaries. *J Am Board Fam Med*. 2012;25(6):862-868. doi:10.3122/jabfm.2012.06.120046.

26. Medicare. *Home Health Services*. Date unknown. https://www.medicare.gov/coverage/home-health-services. Accessed September 23, 2018.
27. Bouman A, van Rossum E, Nelemans P, Kempen GI, Knipschild P. Effects of intensive home visiting programs for older people with poor health status: a systematic review. *BMC Health Serv Res*. 2008;8:74. doi:10.1186/1472-6963-8-74.
28. *House Calls*. Date unknown. https://www.aafp.org/afp/2011/0415/p925.pdf. Accessed September 24, 2018.
29. *An Aging Nation: The Older Population in the United States*. Date unknown. https://www.census.gov/prod/2014pubs/p25-1140.pdf. Accessed August 24, 2017.
30. Rangel C. *H.R.3590—111th Congress (2009-2010): Patient Protection and Affordable Care Act* https://www.congress.gov/bill/111th-congress/house-bill/3590. Published March 23, 2010. Accessed September 24, 2018.
31. *Independence at Home Act of 2017 (S. 464)*. GovTrack.us. Date unknown. https://www.govtrack.us/congress/bills/115/s464. Accessed September 24, 2018.
32. *Independence at Home Demonstration.* Center for Medicare & Medicaid Innovation. Date unknown. https://innovation.cms.gov/initiatives/independence-at-home/. Accessed September 24, 2018.
33. *Independence at Home Demonstration Fact Sheet*. https://innovation.cms.gov/Files/fact-sheet/iah-fs.pdf. Published July 2016. Accessed September 24, 2018.
34. Cohen-Mansfield J, Shmotkin D, Hazan H. The effect of homebound status on older persons. *J Am Geriatr Soc*. 2010;58(12):2358-2362. doi:10.1111/j.1532-5415.2010.03172.x.
35. Whittemore R, Knafl K. The integrative review: updated methodology. *Journal of Advanced Nursing*. 2005;52(5):546-553. doi:10.1111/j.1365-2648.2005.03621.x.
36. Bowling A. *Research Methods in Health: Investigating Health and Health Services*. 3rd ed. Maidenhead: Open University Press; 2009. https://trove.nla.gov.au/version/45460828. Accessed September 30, 2018.
37. Labreche T, Stolee P, McLeod J. An optometrist-led eye care program for older residents of retirement homes and long-term care facilities. *Can Geriatr J*. 2011;14(1):8-11. http://cgjonline.ca/index.php/cgj/article/view/3. Accessed June 16, 2017.
38. Gluzman R, Meeker H, Agarwal P, et al. Oral health status and needs of homebound elderly in an urban home-based primary care service. *Spec Care Dentist*. 2013;33(5):218-226. doi:10.1111/j.1754-4505.2012.00316.x.
39. Grue EV, Finne-Soveri H, Stolee P, et al. Recent visual decline—a health hazard with consequences for social life: a study of home care clients in 12 countries. *Curr Gerontol Geriatr Res*. 2010;2010: 503817. doi:10.1155/2010/503817.
40. Musich S, Wang SS, Hawkins K, Yeh CS. Homebound older adults: prevalence, characteristics, health care utilization and quality of care. *Geriatr Nur (Lond)*. 2015;36(6):445-450. doi:10.1016/j.gerinurse.2015.06.013.
41. *Depression in Homebound Older Adults: Recent Advances in Screening and Psychosocial Interventions*. Date unknown. https://www-ncbi-nlm-nih-gov.mec.ezproxy.cuny.edu/pmc/articles/PMC3582679/. Accessed September 30, 2018.
42. Cohen-Mansfield J, Shmotkin D, Hazan H. Homebound older persons: prevalence, characteristics, and longitudinal predictors. *Arch Gerontol Geriatr*. 2012;54:55-60. http://ac.els-cdn.com/S0167494311000422/1-s2.0-S0167494311000422-main.pdf?_tid=f43efef8-5230-11e7-b933-00000aacb362&acdnat=1497575767_0e6a4976dba58d284da024eb6a77a75a. Accessed June 16, 2017.
43. Richard L, Furler J, Densley K, et al. Equity of access to primary healthcare for vulnerable populations: the IMPACT international online survey of innovations. *Int J Equity Health*. 2016;15. doi:10.1186/s12939-016-0351-7.
44. *New CMS Proposed Homebound Policy Would Leave Medicare Beneficiaries Without Coverage*. Center for Medicare Advocacy. Date unknown. http://www.medicareadvocacy.org/new-cms-proposed-homebound-policy-will-leave-medicare-beneficiaries-without-coverage/. Accessed September 23, 2017.