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

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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. 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. In the United States, there were four million homebound older adults who receive primary care at home in 2016. The homebound population is expected to rise as the aging population increases. 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. 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. 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. 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. 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, poor dentition, high prevalence of depression, and improper use of prescription medications. In addition, homebound older adults have complex and interrelated health problems, substantial functional impairments, and high disease burden and care that prevent them from leaving their homes. They also have higher morbidity rates, use health services at higher rates than their non-homebound counterparts, and are associated with markers of greater socioeconomic vulnerability. Although many older adults prefer to remain living in their homes when they are facing limitations due to illness and disability, the medical care of homebound patients in the United States is not well served by office-based primary care. As a result, homebound patients get fragmented care. Admittedly, there are variations in funding and administration systems in health care delivery across and within countries. Case
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 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.\(^34(p. 2)\) Despite these changes, few subspecialists or non-primary care providers were found to provide home visits.\(^35(p. 867)\)

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.\(^24(p. 2362)\) An understanding of the need for, use of, and access to these 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, 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
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.

**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,30,40,41 an original article that studied an optometrist-led eye care program for seniors in long-term care facilities and retirement homes was included.33 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.38(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.11(p. 2243) They have poor dental care,10,38 and poor diet11(pp. 717,718) and vision decline.37(p. 8,38(p. 1) Polypharmacy16 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 older 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.

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older adults preferred to use prayer, passive coping, and watching television over seeking professional psychiatric or psychological help.\textsuperscript{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.\textsuperscript{10}(p. 763),\textsuperscript{12}(p. 310),\textsuperscript{16}(p. 721),\textsuperscript{38}(p. 10),\textsuperscript{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.\textsuperscript{10}(p. 763),\textsuperscript{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, perceived unimportance of dental and vision care, and local logistical barriers to accessing care.\textsuperscript{37}(p. 10),\textsuperscript{38},\textsuperscript{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.\textsuperscript{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.\textsuperscript{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,\textsuperscript{9}(p. 1435) food,\textsuperscript{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.\textsuperscript{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.\textsuperscript{9,12,39} Forty-two percent of all homebound older adults have depression.\textsuperscript{14} In one study, almost 20% of the sample reported greater than seven of 15 depressive symptoms.\textsuperscript{21} Despite the high prevalence of depression...
<table>
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<tr>
<th>Author(s) year</th>
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<th>Journal</th>
<th>Focus of study</th>
<th>Population sample</th>
<th>Research design/methods</th>
<th>Intervention phenomenon</th>
<th>Outcome measures</th>
<th>Results</th>
<th>Limitation/critique</th>
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<tr>
<td>1. Manski et al (2004) USA</td>
<td>Dental insurance visits and expenditures among older adults</td>
<td>Am J of Public Health 2004;94(5):759-761</td>
<td>DENTAL/ORAL Examine aging population, decreased income, and dental care coverage and utilization</td>
<td>Aging population: 4,232 participants aged 55 years and older (27% older than 75 years old); Lower income adults, middle-income, and upper income adults and homebound disabled</td>
<td>Data from 1996 MEPS sponsored by AHRQ Multivariate analyses to measure effect of income and age assoc dental coverage</td>
<td>None</td>
<td>Utilization of dental service</td>
<td>Dental insurance coverage, wealth, and poverty play role in dental care utilization Lower &amp; 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</td>
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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 | 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; 125 eligible; 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)
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

**Research design/methods**  
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

**Intervention phenomenon**  
Three nonconsecutive days of 24-hr dietary recall  
Nutrient analysis using Nutrition Data System software

**Outcome measures**  
Associations of individual characteristics and HRFs with low nutrient intake  
**Individual characteristics:**  
1. age  
2. education  
3. income  
4. marital status  
5. living arrangement  
6. 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 defects; diminished sense of smell and taste; (5) physical limitation in meal preparation and consumption measured by nine questions measuring difficulty performing task 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) We stress 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 less height as indicator for original height for subjects unable to stand

**Results**  
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

**Limitation/critique**  
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  
Meal should be customized to the needs of the recipients (palatability, tastes, and preferences)

(continued)
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  

**Focus of study**  
Examine the relationships between under-eating and these factors: medical, functional, economic, oral health, social, religious, and psychological  

**Population sample**  
230 homebound older adults  

**Research design/methods**  
Descriptive statistics, chi-square analysis, one-way analysis 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, 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  

**Intervention phenomenon**  
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, psychological  

**Outcome measures**  
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  

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**Limitation/critique**  
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 led to underestimation 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)
5. Grue et al. (2010)

**Focus of study:**
Recent visual decline—a health hazard with consequences for social life: a study of home care clients in 12 countries

**Population sample:**
106,514 participants > 65 years receiving home care

**Research design/methods:**
Observational, prospective, quantitative study in multi-country

**Intervention phenomenon:**
Use of RAI-HC to determine prevalence of visual impairment and recent visual impairment.

**Outcome measures:**
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

**Results:**

- Recent visual decline common among female gender and living alone associated with RVD.
- Prevalence of visual decline (WIT 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 Implications:**
Aware of RVD and consequences and help patients receive proper assessments, treatment and rehabilitation.

**Future/Gaps:**
Battery of tests needed to detect visual impairments in other studies instead of reading text.

**Limitation/critique:**
No way to determine whether RVD was worse than previous.

**Table 2. (continued)**
DENTAL
USA
ORIGINAL RESEARCH
Patterns of therapeutic prescription medication category use among community-dwelling homebound older adults
doi:10.1002/pds.1066

**Author(s) year**

**Focus of study**

**Population sample**

326 homebound elders 60 years and older

**Country**

**Journal**

**Doi**

**Results**

**Limitation/critique**

**Intervention phenomenon**

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 to 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

**Outcome measures**

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 73% 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 not 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

**Research design/methods**

Multivariate logistic regression model for all IV with ordinal polychotomous DV for used of increasing number of therapeutic prescription med categories CI 95%

**Research design/methods**

**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 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

**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%

**Intervention phenomenon**

Medication—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 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

**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 not 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

**Implcation to Practice:** Providers of services to older persons need to be aware of difference in therapeutic med use within this population and how patterns of use may alter service needs

**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

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<tr>
<th>Author(s) year</th>
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<th>Population sample</th>
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<td>7. Choi et al (2007) USA ORIGINAL ARTICLE</td>
<td>DEPRESSION To examine whether homebound older adults are likely to self-report more depressive symptoms than ambulatory peers. To examine whether social support, religiosity, and physical exercise mitigate relationships among homebound status, health and psychosocial risk factors and depressive symptoms.</td>
<td>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.</td>
<td>Cross-sectional study. 156 of 1,399 (11.3%) MOW clients met inclusion criteria. Inclusion: cognitively intact, physically able to engage in face-to-face interview for 1.5 hours. 81 of 156 interviewed. 26 unable to contact, 23 to weak for interview. 3 hearing or speech problem.</td>
<td>Depressive symptoms measured by 15-item GDS. Coping resources measured by 18-item Lubben Social Network Scale (LSNS). Lazarus and Folkman’s stress-coping model to examine relationship among life stressors, coping resources and depressive symptoms.</td>
<td>Depressive symptoms using GDS. Sociodemographic using age, race/ethnicity (AA, Hispanic); non-Hispanic white; gender; level of education; financial situation. Health-related stressors9 medical condition: arthritis, HTN, DM, diseases of heart &amp; lung; cancer; stroke, kidney; liver disease. ADLs: toilet, dressing, hair, in/out of bed. IADLs: telephone, meal prep, shopping, house work, taking meds, managing money. Other Life Stressors: Checklist of stressful life events: children leaving home, illness, robbery, 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</td>
<td>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, religiosity, 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 associated 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.</td>
<td>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.</td>
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(continued)
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.

Limitation: Self-reported ED visit data not validated against the subject's medical record. Oral health care is considered less important than other medical care edentulism, carries, poor oral hygiene, periodontal disease and soft tissue lesion among homebound or nursing home elderly subjects.

Reasons for ED visit rate not validated against the discharge diagnoses. Utilization in homebound is limited because of low medical condition. Implications: Need for better education on self-management of chronic conditions. Further research: Identify factors contributing to pain management, and PST important in reducing ED visit rates. Effective pain management symptoms.

Table 2. (continued)

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<tr>
<th>Author(s)</th>
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<th>Country</th>
<th>Journal</th>
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<tr>
<td>Choi et al (2012)</td>
<td>8</td>
<td>USA</td>
<td>J Gen Intern Med. 2012;27:577-584</td>
<td>10.1007/s11606-011-2147-7</td>
<td>To examine relationship between depressive symptom severity and emergency department use among low-income, depressed homebound older adults aged 50 years and older.</td>
<td>668 homebound elderly (211 male, 450 females, 7 no answer)</td>
<td>Cross-sectional study, surveys, Spearman's rank correlation coefficient</td>
<td>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.</td>
<td>Baseline data collected at 3 points: baseline, 12 weeks, and 24 weeks. ED visits The number of and reasons for ED visits at all assessment points: at baseline, 12 weeks and 24 weeks. At baseline, they were asked to report ED visits during the preceding 6 months.</td>
<td>59% AA and 84.4% Hispanic had annual income of &lt;$25,000. 75% had Medicare coverage.</td>
<td>Self-reported ED visit data not validated against the subject’s medical record. ED visit rate much higher than that reported in other studies.</td>
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<td>Morishita et al (2001)</td>
<td>9</td>
<td>Japan</td>
<td>J Oral Rehabil. 2001;28(8):717-720</td>
<td></td>
<td>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).</td>
<td>688 homebound elderly (211 male, 450 females, 7 no answer)</td>
<td>Longitudinal study to examine relationship between depressive symptoms and the frequency of ED visits. Case managers at MOW program referred participants.</td>
<td>Baseline data collected at 3 assessment points: baseline, 12 weeks and 24 weeks. At baseline, they were asked to report ED visits during the preceding 6 months.</td>
<td>ED visits The number of and reasons for ED visits at all assessment points: at baseline, 12 weeks and 24 weeks. ED visits since baseline, at 24 weeks. At baseline, they were asked to report ED visits during the preceding 6 months.</td>
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<td>Labreche et al. (2011)</td>
<td>Canada</td>
<td>ORIGINAL RESEARCH</td>
<td>10.</td>
<td>Describes the optometrist-led eye care program for residents in institutional settings</td>
<td>91 residents; Mean (SD) age = 87.0 years; 72 women; 19 women (Homebound)</td>
<td>No informed consent as care considered “usual care.”</td>
<td>Comprehensive initial eye exam</td>
<td>F/U care</td>
<td>Residents of LTC had more than one ocular condition/disease presented greater clinical challenges than those from retirement homes</td>
<td>Cognitive impairment, confusion, lack of response provided challenges to provision of care</td>
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<td>Difficulty to complete the examination</td>
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<td>Involvement of family members necessary</td>
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<td>Homebound adults need vision service</td>
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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; OASSS = Outcome and Assessment Information Set; USDA = United States Department of Agriculture; DV = dependent variable; EER = Estimated Energy Requirement; IV = independent 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. Furthermore, it was noted that low-income older homebound individuals with severe depression had increased number of emergency department visits.

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 in homebound older adults is associated with under-eating, and increased burden of disease and care. Increased disease symptoms are associated with hospitalization and polypharmacy. There is also an association with vision decline and social isolation. Finally, social isolation is associated with worsening depressive symptoms and under-eating. 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, it is important for achieving equity of care through interventions that address social and health determinants.

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.” For example, epidemiological researchers often identify homebound individuals by self-report without regard to the assessed functional or cognitive capacity of the individual. In the United States, Medicare defines homebound for the purpose of receiving home health benefit. 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.

Furthermore, in countries like Israel and Japan, homebound is defined from a screening survey question querying how many times a person leaves the home. 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. 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. 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.

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.

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