

## Factors to assess depression in homebound older adults

Jennifer E. Thomas, PharmD, AAHIVP<sup>1</sup>; Robin J. Jacobs, PhD, MSW, MSBI<sup>2</sup>;  
 Joshua Caballero, PharmD, BCPP<sup>3</sup>; Raymond L. Ownby, MD, PhD, MBA<sup>4</sup>;  
 Elizabeth M. Lessmann, PharmD<sup>5</sup>; Kayla Mallare<sup>6</sup>; Mark Adler, MPH<sup>7</sup>

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### Abstract

**Introduction:** The number of homebound older adults is expected to increase as the elderly population grows. Many homebound older persons may be at high risk for depression, which has been associated with adverse health outcomes. The objective of this study was to identify selected factors that may predict depression in the homebound older population.

**Methods:** Data from 340 homebound adults, aged 65 and older who were enrolled in Broward Meals on Wheels and who participated in a telephone survey were analyzed. Participants were asked to report demographic information, health status, medication-taking behaviors, mental health, and life satisfaction. Multiple regression analysis was used to identify predictors of depressed mood in this sample of older adults.

**Results:** The majority of the sample (aged 65–95 years; mean, 77 years) were female (76.5%), white (77.1%), and living alone (52.6%). Multivariate modeling indicated that difficulty remembering the number of prescribed medications to be taken, feeling *groggy* after taking certain medications, poor self-reported health status, taking anxiety medications, and less satisfaction with life explained 34% (adjusted  $R^2$ ) of the variance in predicting depressed mood ( $F = 33.1$ ,  $df = 5$ ,  $P < .001$ ).

**Discussion:** Multiple factors related to medication use were identified that may contribute to higher levels of depressed mood in homebound older adults. These factors found in our study may be used to create a screening model to be used by pharmacists to identify homebound older adults who would benefit from further assessment for depression.

**Keywords:** depression, older adults, geriatrics, elderly, homebound

<sup>1</sup> Assistant Professor, School of Pharmacy, Husson University, Bangor, Maine; <sup>2</sup> Associate Professor, College of Osteopathic Medicine, Nova Southeastern University, Fort Lauderdale, Florida; <sup>3</sup> (Corresponding author) Associate Professor, College of Pharmacy, Nova Southeastern University, Fort Lauderdale, Florida, [jcaballe@nova.edu](mailto:jcaballe@nova.edu); <sup>4</sup> Professor, College of Osteopathic Medicine, Nova Southeastern University, Fort Lauderdale, Florida; <sup>5</sup> Pharmacy Resident, Baylor St Luke's Medical Center, Houston, Texas; <sup>6</sup> Pharmacy Student, College of Pharmacy, Nova Southeastern University, Fort Lauderdale, Florida; <sup>7</sup> Executive Director, Broward Meals on Wheels, Plantation, Florida

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### Introduction

Adults aged 65 and older made up 13% of the total US population in 2010, with more than 40 million people falling into this age range.<sup>1</sup> This number is expected to increase to more than 54 million people by the year 2020.<sup>2</sup> As the elderly population grows, the number of homebound older adults is also increasing at a concerning rate.<sup>3</sup> Poor health contributes to this phenomenon, and comorbid illnesses such as diabetes, hypertension, and psychiatric disorders are commonly found in this population.<sup>4,5</sup> Among psychiatric illnesses, depression has been found in statistically higher rates among homebound

older adults compared with the non-homebound population.<sup>3</sup>

Social isolation and loneliness are risk factors that increase the rates of depression,<sup>6,7</sup> and many homebound adults lack social support, which may increase their risk of developing depressive symptoms. Depression is associated with suicidal ideation in older adults. One study in homebound elders receiving meal delivery services found that 13% of participants reported active or passive suicidal thoughts.<sup>8</sup> Additionally, the risk increased significantly with the occurrence and increasing severity of depression.<sup>8</sup> Depression in older adults has also been associated with adverse health effects including higher rates of cognitive impairment or anxiety,<sup>9-13</sup> medication non-adherence,<sup>14</sup> and increased side effects (eg, sedation, falls).<sup>15</sup> Recognizing factors that may predict depression in older homebound adults may help us to more accurately identify and treat these patients.

We hypothesized that difficulty remembering the number of medications needed to be taken, taking prescription medications for anxiety, experiencing *grogginess* after taking certain medications, having lower life satisfaction, and self-reporting a lower health status would have a significant influence on depression in homebound persons aged 65 and older. Therefore, the purpose of this study was to evaluate factors among homebound older adults to improve our accuracy in predicting which factors might contribute to their depression.

## Methods

A cross-sectional research design was used to examine the relationships among cognitive (self-reported memory regarding medications), physical (eg, adverse effects, self-reported health status), and psychological factors (eg, anxiety, life satisfaction) and depressed mood in homebound older adults. Regression analyses were used to explore the relative contributions of the predictor variables (ie, cognitive, physical, and psychological factors) to the predicted variable depressed mood. Institutional Review Board approval was obtained from our institution.

## Data Collection

Data for this study (collected from July 2011 to February 2013) were collected from a telephone survey conducted in the English language by Broward Meals on Wheels with homebound older adults aged 65 and older who received their meal services. Broward Meals on Wheels is a private, nonprofit organization that provides services to homebound elders in Broward County, Florida. The survey lasted 25 to 30 minutes and participants were asked 48

questions regarding their demographics, health status, medication use, overall life satisfaction, and mood. For the purposes of our research, we focused on specific themes such as medication-taking behaviors, medication use to treat psychological issues (eg, anxiety), medication side effects (eg, sedation), life satisfaction, and health status that might be related to depression in our study population. Questions that did not have a high rate of response or that had a large number of participants choosing a certain answer were not analyzed.

## Survey Items

Demographic items included age, sex, race, ethnicity, primary language spoken, marital status, education, household monthly income, living situation, whether the participant had a primary caregiver, and if they were a caregiver to a child aged 18 or younger.

To test one aspect of cognition in the elderly (ie, memory) as a possible predictor of depressed mood in our study population, we used the item “Is it difficult to remember how many medications you are supposed to take? (*yes/no*).” To test the contribution of psychological variables as possible predictors, we included “Are you prescribed any pills for nervousness or anxiety? (*yes/no*)” and “Are you basically satisfied with your life? (*yes/no*).”

To explore whether physical issues might contribute to depressed mood, we included the items “Do you ever feel groggy after taking certain medications? (*yes/no*)” and “In general, how would you say your health is?” Possible Likert-type responses were 1 = *poor*, 2 = *fair*, 3 = *good*, 4 = *very good*, and 5 = *excellent*.

The predicted variable depressed mood was measured as a continuous variable by the item “During the past 4 weeks, have you felt downhearted, blue and/or depressed? Using a rating scale of 1–6, in which higher numbers reflect higher levels of depressed mood (ie, 1 = none of the time, 2 = a little of the time, 3 = some of the time, 4 = a good bit of the time, 5 = most of the time, 6 = all of the time).”

## Data Analysis Procedures

Data on 341 participants were de-identified prior to the team’s receipt of the data and were then analyzed using IBM SPSS Statistics Version 22 (IBM Corp, Armonk, NY). Questionnaires with more than one third (33%) of missing data were excluded from data analysis; only one case was dropped due to missing data, resulting in a sample size of 340.

Descriptive statistics were obtained in order to characterize the sample. To test the hypothesis, multiple regression

**TABLE:** Regression model summary for predicted variable depressed mood<sup>a</sup>

Predictor variables	B	SE	Beta	t	Sig
Is it difficult to remember how many medications you are supposed to take?	-.503	.211	-.113	-2.381	.018
Are you prescribed any pills for nervousness or anxiety?	-.423	.158	-.128	-2.671	.008
Do you ever feel groggy after taking certain medications?	-.703	.208	-.164	-3.373	.001
Are you basically satisfied with your life?	1.134	.191	.290	5.939	.000
In general, how would you say your health is?	-.361	.066	-.269	-5.452	.000

B = coefficient; SE = standard error; Sig = significance.

<sup>a</sup>The predicted variable depressed mood was identified as “having felt downhearted, blue and/or depressed during the past 4 weeks.”

analysis was performed to assess the relationship between depression and various potential predictors. The purpose for selecting this statistical procedure was to explore the relative contributions of predictor variables (memory regarding taking medications, anxiety, life satisfaction, grogginess after taking medications, and self-reported health status) to the predicted variable (depressed mood).

## Results

### Univariate Analysis

Out of 340 participants, most were female (n = 260; 76.5%), white (n = 262; 77.1%), and lived alone (n = 179; 52.6%). Participants' ages ranged from 65 to 95 years (mean, 77; SD, 8.2). About one third (n = 106; 31.2%) reported being married and 17.4% (n = 59) reported having a primary caregiver. The majority (n = 244; 71.8%) had a monthly household income of less than \$2,500.

### Multivariate Analysis

The Table demonstrates that multivariate modeling successfully explained 34% (adjusted  $R^2$ ) of the variance in depressed mood, which was significantly related to memory issues regarding the number of medications needed to be taken, receipt of prescription medications for anxiety, grogginess after taking certain medications, life satisfaction, and self-reported health status ( $F = 33.1$ ,  $df = 5$ ,  $P < .001$ ). Less ability to remember the number of medications needed to be taken, having been prescribed medications for anxiety, grogginess after taking certain medications, lower self-reported health status, and less life satisfaction were related to higher levels of self-reported depressed mood. Overall, 3 of the 5 factors identified were related to medication use practices.

## Discussion

The study identified 5 items, 3 of which were medication related, associated with depression in homebound elderly adults. *Difficulty remembering the number of medications to be taken* was associated with depression in our sample. A

number of factors may contribute to the observed relation between depressed mood and memory complaints. One factor may be the high pill burden many older adults have. The average person over the age of 65 fills more than 6 unique prescriptions each year, excluding refills.<sup>16</sup> The greater number of medications may increase the likelihood of experiencing adverse effects or drug/drug interactions, since confusion may occur (eg, administration schedules). Additionally, people taking multiple prescription medications are likely to also be diagnosed with chronic conditions, some of which have been associated with increased rates of depression.<sup>17</sup> Identifying these patients also provides an opportunity to assess the patient for any adverse effects and ensure the medication regimen is appropriate.

Another significant contributor to depression was *feeling groggy after taking certain medications*, a side effect that can lead to falls. It is important that health care providers assess patients for medication adverse effects, since studies show that up to 40% of elderly patients are prescribed inappropriate medications.<sup>18</sup> Data also demonstrate depression is associated with falls in older adults<sup>19</sup>; therefore, grogginess or drowsiness is a particularly concerning adverse effect in homebound older adults.

The *use of prescription medications for the treatment of anxiety or nervousness* was also found to be associated with depression. Anxiety disorders have been known to be associated with mood disorders, including depression, in more than a quarter of patients.<sup>13</sup> Therefore, it is not surprising that participants who reported experiencing feelings of depression also had a higher likelihood of having an anxiety disorder. Many of the medications that participants reported taking for treatment of anxiety are also used in the treatment of depressive disorders (eg, selective serotonin reuptake inhibitors). However, some participants could have been on subtherapeutic doses, as they continued to experience symptoms of depression. Studies show that approximately 70% of those with anxiety and depression reported not receiving appropriate treatment consistent with treatment guidelines.<sup>20,21</sup>

Therefore, it is important that health care providers monitor depressive and anxiety symptoms and adjust medications accordingly.

*Lower self-reported health status* was associated with higher rates of depression. Depression is associated with many chronic illnesses and is associated with poorer health outcomes in patients with chronic illness. The association between depression and overall health status is complex. Depressed patients are more likely than nondepressed patients to be nonadherent to medication therapy,<sup>14,22</sup> which can result in worse health outcomes. Two meta-analyses found depressed patients were more likely to be nonadherent to prescribed medical treatment when compared with nondepressed patients.<sup>14,22</sup> Some studies have found depression may also have a direct effect on the course of chronic illnesses (eg, congestive heart failure) leading to increased hospitalizations and mortality.<sup>23,24</sup> Therefore, being able to identify depression is important in older adults who suffer from many chronic conditions.

Our findings indicated that reports of *less life satisfaction* were associated with depression. Previous studies have also shown poorer levels of life satisfaction in patients with depressive disorders.<sup>25,26</sup> Therefore, it is not surprising to find homebound elders who are less satisfied with their lives are more likely to report feelings of depression.

A screening method that is currently used in primary care settings to identify patients requiring further assessment for depression is the Patient Health Questionnaire (PHQ)-2.<sup>27</sup> This 2-question questionnaire consists of the first 2 questions from the PHQ-9, which refer to depressed mood and anhedonia. These questions ask “Over the past 2 weeks, how often have you been bothered by any of the following problems: (1) little interest or pleasure in doing things, and (2) feeling down, depressed, or hopeless?” The PHQ-2 has been validated as a screening tool for depression in the general population<sup>28</sup> and in older adults.<sup>29</sup> However, studies are lacking in the homebound older adult population, who may have different risk factors when compared with the general elderly population. Therefore, more studies are needed in the homebound elderly population to determine the best method to screen for depression.

Our study, using a phone interview, identified 5 predictors that were associated with higher risk of depression in a homebound older adult population. These factors were (1) difficulty remembering the number of medications to be taken, (2) feeling groggy after taking certain medications, (3) taking prescription medications to treat anxiety or nervousness, (4) lower self-reported health status, (5) and lower life satisfaction. These predictors could be used to develop an alternative screening tool to identify patients

requiring further follow-up for depression in this patient population. Health care providers often do not have time to perform depression inventories for all patients. While, the PHQ-2 exists, a screening tool that includes an additional 3 to 4 basic questions, including some related to medications and side effects, completed over the phone by trained pharmacists or pharmacy students could be a time-efficient method to identify patients who should undergo further screening for medication-related problems. Additionally, follow-up questions may be used to further explore medication-related issues that will need to be addressed.

This study had several limitations. A cross-sectional, correlational survey design was used to collect data for this study. Therefore, generalizations cannot be made regarding changes or trends over time, directionality of influence, or cause-and-effect relationships. A convenience sample was used to collect data, which may have resulted in self-selection effects. Therefore, there may have been a sampling bias, which limits the ability to generalize findings. Another limitation was that while medications regarding depression and anxiety were recorded, complete medication regimens and medication doses were not documented. Therefore, it is not possible to assess for the possibility of drug-drug interactions or excessive medication doses that may have led to an increased risk of adverse effects. Additional confounding variables may also have affected the results. Another limitation is the homogeneity of the sample, which was predominately white and female. Also, health status and memory were self-reported, and thus subjective. Additional limitations include the method used to choose the variables that were assessed as predictors of depression, and the weakness of the multivariable analysis.

## Conclusion

Depression is associated with an increase in morbidity and mortality among older homebound adults. There is a need for a better method to identify depression in this population. Current surveys do not adequately assess medication use to determine depression. Certain factors related to depression in the homebound elderly may be identified through proper screening and are amenable to intervention. Findings from this study may be helpful in guiding the development and testing of a brief and effective screening tool that pharmacists may use to identify those persons who would benefit from further assessment for depression.

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