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Comparison of depressive symptoms between homebound older adults and ambulatory older adults

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Abstract

Due to the social isolation imposed by chronic illness and functional limitations, homebound older adults are more vulnerable to depression than their mobility-unimpaired peers. In this study, we compared 81 low-income homebound older adults, aged 60 and older, with their 130 ambulatory peers who attended senior centers, with respect to their depressive symptoms, depression risk and protective factors, and self-reported coping strategies. Even controlling for sociodemographics, health problems, and other life stressors, being homebound, as opposed to participating in senior centers, was significantly associated with higher depressive symptoms. However, when the coping resources—social support and engagement in frequent physical exercise, in particular—were added to the regression model, the homebound state was no longer a significant factor, showing that the coping resources buffered the effect of the homebound state on depressive symptoms. In terms of self-reported coping strategies, even among the depressed respondents, only a small proportion sought professional help, and that was largely limited to consulting their regular physician and social workers, who may not have had professional training in mental health interventions.

Introduction

Extant research findings show a high prevalence of depressive symptoms among older adults, accompanying their chronic medical problems, functional impairments, and other vulnerabilities to diverse physiological and psychosocial stressors in later life (Bruce 2001; Cole & Dendukuri, 2003; Geerlings, Beekman, Deeg, & van Tilburg, 2000; Schoevers et al., 2000; U.S. Department of Health and Human Services [DHHS], 1999, 2001). Research has also been done on disparities or similarities in prevalence of late-life depression, risk factors, and coping strategies as well as in access to mental health services among different groups of older adults such as racial/ethnic minorities (Blazer, Landerman, Hays, Simonsick, & Saunders, 1998; DHHS, 2001, George, 1994; Husaini, 1997; Jang, Borenstein, Chiriboga, & Mortimer, 2005; Mills, 2000, 2001; Mills & Edwards, 2002).

Despite an increasing interest in disparities in late-life mental health status and access to mental health services among different groups of older adults, only limited research attention has been paid to homebound older adults' mental health problems. Due to the

social isolation imposed by chronic illness and functional limitations, homebound older adults may be more vulnerable to depression than their mobility-unimpaired peers. Nevertheless, their homebound state makes their mental health needs largely unrecognized and undiagnosed, and it is a barrier to their receiving appropriate mental health treatment. Despite projections that overall disability rates in later life will continue to decline (He, Sengupta, Veikoff, & DeBarros, 2005), the rapid growth of the oldest-old population is likely to increase the number of homebound older adults who require in-home support services for their IADL and ADL (instrumental activities of daily living and activities of daily living) tasks as well as mental health interventions. If the mental health needs of these isolated older adults is not properly addressed, other healthcare and social services are likely to have limited effects on their quality of life.

In this study, we present comparisons between a group of low-income homebound older adults, aged 60 and older, and their ambulatory peers, with respect to their depressive symptoms, their risk of being depressed, factors that may protect them against depression, and self-reported coping strategies. We define *homebound older adults* as those who, due to medical conditions and/or mobility-affecting impairments, are not able to freely leave their home and require help in doing so. *Ambulatory older adults* are those who can independently move into and out of their homes and, specifically in this study, those who participate in senior center activities.

Literature review and theoretical framework

Illness- and disability-induced confinement in one's home limits engagement in social interactions and activities and may also reduce contacts with relatives, friends, and neighbors. The feelings of isolation from the outside world and loneliness are likely to contribute to increased depressive symptoms (see Adams, Sanders, & Auth, 2004; Alpass & Neville, 2003; Blazer, 2002). An earlier study, based on data from the Epidemiologic Catchment Area project in New Haven, showed that depression, dysthymia, anxiety, and cognitive impairment were at least twice as prevalent in older adults (aged 65 and older) who were homebound (confined to a bed/ chair or home) as in those who were not homebound (Bruce & McNamara, 1992). When health status was controlled for, however, only dysthymia was significantly more prevalent among the homebound group. Another study showed that 13.5% of 539 visiting nurse agency clients were diagnosed with major depression according to DSM-IV criteria and that 71% of the depressed were experiencing their first episode of depression (Bruce et al., 2002). The study reported that the rate of major depression was twice as high among homecare patients as among those receiving ambulatory care. Predictors of the homecare clients' depression included medical morbidity, IADL impairments, and reported pain, but not cognitive function and sociodemographic factors. Other studies of older adults showed that mobility limitations, along with other disabilities, were significant predictors of depressive symptoms (Beekman, Deeg, Braam, Smit, & van Tilburg, 1997; Prince, Harwood, Blizard, Thomas, & Mann, 1997; also see Blazer, 2003 for review of the impact of medical comorbidity, functional impairment, and cognitive impairment on outcome of depression). Depression, in turn, adversely affects the outcome of the comorbid problems and is an independent risk factor for many medical illnesses and disability (Blazer, 2003, p. M252).

In conducting the present study, we were guided by Lazarus and Folkman's stress-coping model and examined the relationship among life stressors or depression risk factors, coping resources, and depressive symptoms (Lazarus, 1999; Lazarus & Folkman, 1984). Many physical illnesses and functional impairments in later life are chronic conditions that are depression risk factors (Bruce, 2001; Cole & Dendukuri, 2003). Loss and grief, financial constraints, and feelings of loneliness from social isolation can also cause onset of depression or exacerbate depressive symptoms (Blazer et al., 1998; Chiriboga, Black, Aranda, & Markides, 2002; Devanand, Kim, Paykina, & Sackeim, 2002; George, 1994; Mazure, Maciejewski, Jacobs, & Bruce, 2002). To counter negative effects of these stressors in later life, each person engages in coping, defined by Lazarus and Folkman (1984, p.141) as "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person." But the ways people actually cope "heavily depends on the resources that are available to them and the constraints that inhibit use of these resources in the context of the specific encounter" (p. 158). In this study, we focus on three types of coping resources: social support, religiousness, and engagement in physical exercise. Although these coping resources have been found to mitigate the depressogenic effect of stressors in later life, homebound older adults, because of their homebound status, are likely to have many constraints in accessing and utilizing these resources.

Availability and strength of social support is an important coping resource that can help buffer the negative effects of chronic illnesses and functional disabilities and other stressors in life, while interpersonal conflict and decreased social support is another depression risk for older adults (Arean & Reynolds, 2005; Jang, Haley, Small, & Mortimer, 2002; Taylor & Lynch, 2004; Travis, Lyness, Shields, King, & Cox, 2004). According to Bruce (2001), however, further research is needed to examine social support as a protective factor against depression in later life, given the divergent findings that depend on how social support was defined and which aspect of social support was examined. Especially in cross-sectional studies, the social support-depression relationship is difficult to analyze because depression may negatively affect the size and quality of social support. For homebound older adults, as their social support network is likely to decline from reduced contact with the outside world, family support may play an especially important depression-mitigating role, while lack of family support or family conflict may be an amplified source of stress.

In addition to social support, religiousness and spirituality can buffer depression associated with poor physical health (Bosworth, Park, McQuoid, Hays, & Steffens, 2003; Koenig, George, & Titus, 2004; Wink, Dillon, & Larsen, 2005). The findings of these previous studies showed that religiousness and spirituality predicted greater social support, but they were also independently associated with depression outcome in longitudinal studies. Different kinds of religious practices (public and private) may also be differently related to depression outcome (Bosworth et al., 2003). Again, for homebound older adults, their homebound state is likely to be a barrier to their engaging in public religious practices such as attending services. Whether or not they are more likely than their ambulatory peers to engage in private religious practices such as praying remains a question; however, not being able to attend services regularly can be a constraint on religious coping for homebound older adults.

A growing number of studies also found a depression-buffering effect of physical exercise among frail older adults (Holland et al. 2005; Regan, Katona, Walker, & Livingston, 2005; Singh, Clements, & Singh, 2001). Due to both physiological and psychosocial benefits (especially in group settings), exercise can play a positive role in protecting older adults from harmful consequences of stressors and in promoting mental health (see Gallant & Connell, 2003; Salmon, 2001; Scully, Kremer, Meacle, Graham, & Dudgeon, 1998; Timonen, Rantanen, Timonen, & Sulkava, 2002). Compared to their ambulatory peers, however, many more homebound older adults may not be able to engage in physical exercise for health reasons, especially if the exercise routines require vigorous movements or if they are carried out in group settings.

In the present study, we first examine the question of whether homebound older adults are likely to self-report more depressive symptoms than their ambulatory peers when sociodemographics, including financial worries, physical and functional health problems, and other stressful life events, are controlled for as depression risk factors. And then we examine the question of whether social support, religiousness, and physical exercise mitigate relationships among homebound status, health and psychosocial risk factors, and depressive symptoms.

Methods

Sample

We selected our sample of homebound elders, aged between 60 and 96, from recipients of home-delivered meals from the Meals on Wheels (MOW) program and their ambulatory age peers from participants in four senior centers and/or congregate nutrition programs in low-income neighborhoods of a large Texas city (population, 650,000). To select the MOW clients, we asked each MOW case manager ($n = 8$) to refer, from his/her caseload, 15–20 clients who were cognitively intact and physically able to engage in a face-to-face interview process that would take an average of 1 to 1.5 hours. From this invitation, we received 156 referrals, representing 11.3% of the 1,399 MOW clients who were age 60 and older at the beginning of the study in July 2005. Because of the high prevalence of cognitive impairment and frailty among the MOW clients, case managers informed us that these referred cases were all their possible clients who met our inclusion criteria. Of the 156 referrals, 81 were interviewed, with a 52% response rate. The reasons for nonparticipation included our lack of success in contacting them ($n = 26$; disconnected telephone lines, clients not answering despite multiple calls, and clients not responding to messages left on answering machines); clients not feeling well or being too weak to do the interview ($n = 23$; recent stroke, recent or pending hospitalization, recent spousal death); clients having no interest in participating in the study ($n = 10$); clients with hearing or speech problems ($n = 3$); and other (clients with visiting family, having no working air conditioner, having lots going on in the family). All 81 interviews were conducted in the participants' homes.

To recruit senior center participants, we asked staff at each center to distribute our fliers about the study and to make announcements (with research team members) to the participants during congregate dining hours. Those interested in participating in the study were asked to either put their name and contact phone number on a sign-up sheet or return

their written interest form in a preaddressed and stamped envelope to the lead author. A total of 130 senior center participants, aged between 60 and 89, were interviewed, representing approximately 40% of all active participants in four centers. Five interested senior center participants did not pass the cognitive screening, which was done using the 10-item Short Portable Mental Status Questionnaire (SPMSQ; Pfeiffer, 1975), and were not interviewed. About 80% of the interviews were done in private rooms in senior centers, and the rest were done in the participants' homes following their preference. All the interviews were conducted by masters- and doctoral-level social workers who were trained specifically for the project. Twelve interviews were conducted in Spanish by a bilingual/bicultural interviewer using the Spanish version of the interview schedule.

Measures

Depressive symptoms as an outcome measure.—Respondents' depressive symptoms were measured by the 15-item Geriatric Depression Scale (GDS; Sheikh & Yesavage, 1986). Each GDS item was rated as either "yes (=1)" or "no (=0)" by the respondents, and the total scores, ranging from 0 to 15, were calculated. A score of 5 and higher is regarded as symptomatic of depression; however, in multivariate analysis, we used the GDS score as a continuous variable. Cronbach's alphas for the GDS scores were satisfactory at 0.720 for the senior center group and 0.804 for the homebound group.

Sociodemographic characteristics.—The following sociodemographic variables were used as controls: Age (in years); race/ethnicity (African American, Hispanic, or non-Hispanic white = reference category); gender; level of education (ordinal values treated as continuous); and financial situation (1 = really can't make ends meet; 2 = just about manage to get by; 3 = have enough to get along, and even have a little extra; and 4 = money is not a problem; can buy pretty much anything [I/we] want: treated as a continuous variable).

Health-related stressors.—These include the number of chronic medical conditions, the number of ADL/IADL impairments, and the past history of mental health treatment. Chronic medical conditions were measured with a checklist containing the following nine conditions: Arthritis; high blood pressure or hypertension; diabetes; heart diseases (including coronary heart disease, congestive heart failure, angina); emphysema/chronic bronchitis/ other lung problems; cancer/malignant tumor (excluding minor skin cancer); stroke; kidney disease; and liver disease. Respondents were asked, first, if they had ever been told by a doctor or other healthcare professional that they had had the condition, and second, if they had, whether the condition continued to be a problem. For each participant, we counted the total number of conditions that continued to be problems. The total number could range from 0 to 9.

The ADL categories included using the bath or shower; using the toilet; getting dressed or putting on outdoor clothing; combing or brushing hair; getting into and out of bed; and feeding. The IADL categories included using the telephone; preparing and cooking meals; grocery shopping; doing house-work (cleaning, fixing things in and on the house); taking medications; and managing money. The combined ADL and IADL scores ranged from 0 to 12. With respect to the past history of mental health treatment, we asked each respondent if

he or she had “ever been treated by a healthcare professional for depression, anxiety, or other mental health problem in your life.” The response was coded as 1 for “yes” and 0 for “no.”

Other life stressors.—These were measured by a checklist of stressful life events that had occurred in the preceding 2 years and a checklist of current serious problems. The past stressful life events included these: children leaving home; a serious illness or injury; having been robbed or burglarized; the addition of a new family member (baby, immigrant, in-law); death of spouse; death of a child; death of any other family member or friend; spouse’s or other family member’s serious illness or injury; change in residence; and other family difficulty. Respondents were asked whether they had experienced each event and, if they had, whether it had been stressful. Only stressful events were summed into a total score, which could range from 0 to 10 for each respondent.

The checklist of current serious problems included the following: not having enough money to live on; loneliness or not having enough friends; having to depend too much on other people; having to take care of sick spouse or other relative; having too many problems or conflicts in the family. Of these, we chose only loneliness and dependence on other people for the multivariate analysis, because money worries were highly significantly correlated with the financial situation variable (-0.603 , $p < 0.001$) and “having to take care of sick spouse or other relatives” was a problem for only a small number ($n = 16$; 7.6%) of the sample. The method of asking directly for the frequency or intensity of loneliness has been found to have face validity (Pinquart & Sorensen, 2001). Moreover, we found that members of our sample who responded that loneliness was a serious problem had a significantly lower level of social support from family, neighbors, and friends than the rest of the sample who responded that it was not a serious problem ($p < 0.05$). We also assume that the perceived feeling of burden of dependence on other people has face validity.

Coping resources.—The level of social support was measured by the 18-item Lubben Social Network Scale (LSNS; Lubben & Gironde, 2000, 2003). The LSNS is designed to measure the size of older adults’ social support networks—family/relatives, neighbors, and friends—and their actual and perceived levels of social support from these networks. (Examples of LSNS questions include these: “How often do you see or hear from the relative with whom you have the most contact?” “How many relatives do you feel at ease with that you can talk about private matters?” “How often is one of your relatives available for you to talk to when you have an important decision to make?”) Each item is measured on a 6-point scale ranging from 0 to 5, with a higher score indicating a higher level of actual or perceived social support. The maximum possible score for each subscale is 30. In our study, Cronbach’s alphas for the homebound group were 0.783 for the family subscale, 0.764 for the neighbors subscale, and 0.770 for the friends subscale. Cronbach’s alphas for the senior center group were 0.747 for family, 0.808 for neighbors, and 0.821 for friends. Although previous studies (Taylor & Lynch, 2004; Travis, Lyness, Shields, King, Cox, 2004) found that different dimensions of social support, such as perceived versus received support and frequency of interaction, mediated the depression-functional disability association in different ways, we decided to use the combined scores for actual and perceived social

support for each subscale, given the highly significant correlations between actual support and perceived support (0.554 for the family subscale, 0.579 for the neighbors subscale, and 0.659 for the friends subscale, $p < 0.001$ for all three subscales).

Religiousness was measured by two variables: frequency of attendance at religious services (0 = never; 1 = less than once a year; 2 = once a year; 3 = several times a year; 4 = once a month; 5 = several times a month; 6 = once a week; and 7 = more than once a week: treated as a continuous variable) and whether or not the respondent “prays frequently” to “get out of the mood when feeling sad, depressed, or down in the dumps.”

Physical exercise was measured by the following checklist: moderate/vigorous exercise—as defined by the respondent—at least three times a week; moderate/vigorous exercise once or twice a week; do not exercise for health-related reasons; do not exercise for non-health-related reasons. For the multivariate analysis, we combined the last two categories into one, “do not exercise.”

Self-reported coping strategies.—Each respondent was asked a question, “When you feel sad, depressed, or down in the dumps, what do you usually do to help you get out of the mood?” Then he or she was provided a list of 20 coping methods, including “talk to spouse/family member,” “pray frequently,” and “talk to a social worker.” The respondents were encouraged to describe any other coping methods that they used. Each coping method was rated as either “yes (=1)” or “no (=0)” by the respondents.

Data analysis

Bivariate analyses were done to compare home-bound older adults and senior center participants in terms of their characteristics: Sociodemographics including household income, health problems and other life stressors, coping resources, and depressive symptoms. With respect to self-reported coping strategies, descriptive bivariate analysis was done to compare the homebound group with the senior center group and also the depressed group and the nondepressed group. In order to examine risk and protective factors of depressive symptoms as an outcome variable, we employed 2-step OLS regression models. In the first step, in addition to the respondent’s status (homebound older adult vs. senior center participant) as a predictor, sociodemographic controls and health-related stressors as well as other life stressors were entered. In the second step, coping resources were added to the model. Since the GDS scores for the senior center participants had an over-dispersion problem, we also ran negative binomial regression analysis (using *Stata 9*). However, since the results of this analysis were almost identical to the OLS regression results, we chose to report the OLS regression results with R^2 statistics rather than the negative binomial regression results with pseudo R^2 statistics. We also tested the effects of the interaction terms between the respondent status and significant stressors as well as the interaction terms between the respondent status and significant coping resources. Due to the insignificance of these interaction terms, only the main effects of the risk factors and coping resources are presented.

Results

Respondents' characteristics

Data in Table I show that the homebound group, with an average age of 76.2, was significantly older than the senior center group who were, on average, 71.9 years old. As many as 42% of the homebound respondents were aged 80 and older, while only 16.9% of the senior center attendees were aged 80 and older. Because all four senior centers were located in low-income neighborhoods with a high concentration of racial/ethnic minorities, a large proportion of the participants were African Americans or Hispanics (a majority of them Mexican Americans). The senior center sample, with 40.8% African Americans and 38.5% Hispanics, mirrored the racial/ethnic composition of these centers' regular participants. The home-bound group had a significantly higher proportion of non-Hispanic whites than the senior center group (59.3% vs. 20.8%). Nearly 30% of the senior center group were married, as compared to 8.6% of the homebound group. About 45% of the senior center group and 33% of the homebound group had not completed high school, and the median annual household incomes of both groups were between \$10,001 and \$12,500. Altogether, 66.8% of the total sample had annual household incomes below \$15,000, and 82.5% had annual household incomes below \$25,000. The subjects' low economic status is also shown in their evaluation of their own financial situation: 50% of the senior center group and 68% of the homebound group reported that they could not make ends meet or were barely getting by.

Further analyses showed Hispanic respondents had significantly lower levels of education than African Americans and non-Hispanic whites. Other than this difference, no racial/ethnic difference was found in any sociodemographic characteristics including household income, health problems and other life stressors, coping resources, and depressive symptoms. The absence of racial/ethnic differences is most likely due to the fact that an absolute majority of the sample members from all three racial/ethnic groups were low income, and therefore, the usual class difference among racial/ethnic groups did not exist in the study sample.

As expected, the homebound group was significantly worse off than the senior center group in their health status, with more chronic health problems and functional impairments. However, the two groups did not differ significantly in previous experience of professional mental health treatment. They also did not differ in the number of stressful life events they had experienced. However, a significantly higher proportion of the homebound group indicated that not having enough money to live on, being lonely or not having enough friends, and having to depend too much on other people were serious problems. The proportion of the homebound group who said that family problems or conflicts were serious did not differ significantly from that of the senior center group. Of social support, support from family and friends was significantly lower among the homebound group than among the senior center group, while support from neighbors did not differ. The homebound state was also likely to have affected many older adults' ability to attend religious services regularly. (Several homebound older adults mentioned that they could not go to church because they did not have anyone to take them there.) Less than one third of the homebound

group, as compared to almost 87% of the senior center group, attended services several times a month or more. The homebound group was also significantly less likely to engage in exercise routines, with 27.2% indicating that they did not exercise for health reasons. Of those who were not exercising for reasons other than health (7.7% of the senior center group and 24.7% of the homebound group), a large proportion (60% of the senior center group and 64% of the homebound group) expressed an interest in trying exercise.

It is not surprising that the homebound group, with significantly worse health and lower social support than the senior center group, had a mean GDS score that was significantly higher than that of the senior center group (4.60 [$SD = 3.26$] vs. 1.96 [$SD = 2.25$], $p < 0.001$). When the GDS caseness criterion of a score of 5 or higher was used, 42% of the homebound group, as compared to 13.1% of the senior center group, showed depressive symptoms. All except two of the homebound older adults and senior center participants who showed depressive symptoms (24.2% of the study sample) had mild to moderate levels of symptoms, with GDS scores between 5 and 11.

Multivariate OLS regression results

As shown in Table II, the homebound state was significantly positively associated with the GDS score in step 1. Of the sociodemographic variables, only financial situation was a significant factor, with better financial situations associated with lower GDS scores. In addition, the numbers of medical problems and ADL/IADL impairments, previous history of mental health treatment, loneliness as a serious problem, and too much dependence on others as a serious problem were positively associated with the GDS score.

In step 2, where coping resources were entered in the model, the homebound state was no longer a significant factor. However, financial situation and health problems, which were found to be significant risk factors in step 1, remained significant. Comparison of the step 1 and step 2 OLS standardized regression coefficients showed that the addition of coping resources in the prediction model appears to have mitigated the depressogenic effect of financial stress and ADL/IADL impairments. With respect to other life stressors, loneliness as a serious problem remained significant and the number of stressful life events became significant. The higher number of stressful life events, the higher the GDS score. On the other hand, too much dependence on others as a serious problem was not a significant factor. The standardized coefficients also show that the effect of loneliness as a serious problem increased. Further analysis of the mediation effect of coping resources, using the differences in coefficients tests developed by Freedman and Schatzkin (1992), showed that the coefficient changes between step 1 and step 2, for the variables financial situation, number of ADL/IADL impairments, and the serious problem of loneliness, were statistically significant ($p < 0.001$), while the change for the number of medical conditions variable was not (also see MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002, for difference in coefficients tests).

In addition to the mediating effect, coping resources—social support and physical exercise, specifically—appear to have independent direct effects on depressive symptoms. A higher level of family support was significantly negatively associated with the GDS score, while a higher level of neighbor support was significantly positively associated with the GDS score.

Engagement in moderate or vigorous physical exercise at least three times weekly was negatively associated with the GDS score. Frequency of religious service attendance and praying were not significant factors. However, further analysis (not reported in the table) showed that, in the absence of the social support variables, the frequency of service attendance (but not praying) was significantly negatively associated with the outcome variable ($p < 0.05$). The more frequent the service attendance, the lower the GDS score. Thus, it appears that the effect of religiousness on depressive symptoms is due mostly to a greater level of social support among those who attend services frequently.

Self-reported coping strategies

As shown in Table III, when senior center participants and homebound older adults were “feeling sad, depressed, or down in the dumps,” they most frequently coped by praying frequently. Television watching or listening to music was the second most frequently mentioned strategy. (Unfortunately, we did not collect data on the TV or radio programs that they were frequently watching or listening; however, several homebound respondents volunteered information that they watched religious programs on TV because they could not go to church.) Talking to family members and friends were the third and fourth most frequently mentioned coping strategies, although a significantly lower proportion of the homebound group than the senior center group used these strategies. Almost one third of the sample mentioned waiting and hoping the problem would go away as a coping strategy. About 18% of the senior center group mentioned talking to clergy as their way of coping, while fewer than 4% of the homebound group did so, obviously because a significantly lower proportion of them attended religious services due to their homebound state and consequently had fewer contacts with clergy. It also appears that homebound older adults did not get visited by their clergy.

Overall, data show that among both groups, passive coping (such as TV watching except in the case of religious programs; listening to music; waiting for the problem to go away; going for walks; having crying spells; brooding and continued worrying) was much more prevalent than seeking professional help. Only 12% of the senior center group and 14% of the homebound group consulted physicians regularly and less than 5% of both groups talked to a psychiatrist/psychologist. A significantly higher proportion of the homebound group than the senior center group (12% vs. 3%) talked to social workers (probably because members of the home-bound group were more likely to come into contact with social workers from social service agencies, including the MOW case managers); however, 12% is still a very small percentage.

Comparison between those who did not show depressive symptoms and those who showed depressive symptoms (i.e., had GDS scores of 5 or higher) shows that a greater proportion of the depressed group listed crying spells, brooding and continued worrying, withdrawing from others, sleeping a lot, and drinking as their coping strategies. Members of the depressed group were also more likely than those of the nondepressed group to list positive thinking (11.8%), consulting a physician regularly (23.5%), getting and taking prescription medications (19.6%), and talking to social workers (13.7%) as their coping strategies. It must be noted, however, that only one person from the depressed group was taking an

antidepressant medication at the time of interview. (The GDS scores for the other four persons who were taking antidepressant medications were below that cutoff point.) Thus, in reality, even among the depressed respondents, only a small proportion sought professional mental health help from their regular physicians and social workers, who may not have had special training in mental health treatment, and an even smaller proportion may have taken some medications.

Discussion

The purpose of this study was to examine the questions of whether homebound older adults were more likely than their ambulatory peers who attended senior centers to show depressive symptoms and whether self-reported coping strategies were different between the two groups. The findings show that as many as 42% of the homebound group, compared to 13% of senior center participants, scored 5 or higher on the 15-item GDS. In terms of coping strategies, as expected, praying and passive personal coping such as TV watching and waiting for the problem to go away were much more prevalent than professional help-seeking for both groups. Because the cross-sectional data are from a geographically limited and relatively small sample, the results need to be interpreted with caution. Nevertheless, the findings of the high prevalence of depressive symptoms among homebound older adults show the importance of screening depressive symptoms and providing necessary services for this isolated group of older adults.

Even controlling for sociodemographics, health problems, and other life stressors, being home-bound, as opposed to participating in senior centers, was significantly associated with higher depressive symptoms. Senior centers, with their variety of services including nutritional, social, recreational, educational, and health-related programs, have been found to contribute to lowering the harmful effect of stresses in later life among their participants, especially among minorities (Farone, Fitzpatrick, & Tran, 2005; Turner, 2004). Participants listed opportunities for social interaction and companionship as important reasons for their participation (Krout, 1998), and an absolute majority of African and Hispanic participants reported that the senior center was their only source of daytime interaction with others (Turner, 2004). Many of our study respondents also commented during their interview that coming to senior centers, even just for meals, helped improve their socialization and mood. In contrast to senior center participants, who can interact with their peers and staff members during group activity and congregate meal times, home-bound older adults are more likely to be socially isolated and eat alone. Thus, it is not surprising that they are more likely to show depressive symptoms than the senior center participants, even controlling for other depression risk factors.

As expected and in parallel to previous study findings, financial situations, physical and functional health statuses, and previous histories of mental health treatment were also significant correlates of depressive symptoms among the study sample. The standardized regression coefficients show that perceived loneliness was an especially strong correlate of depressive symptoms in this group. Given the significant association between socioeconomic status and loneliness among older adults, the mostly low-education and low-income status of the study sample may have amplified the association between loneliness

and depressive symptoms (see Piquart & Sorensen, 2001; Saviko, Routasalo, Tilvis, Strandberg, & Pirkala, 2005). The comments that many respondents, especially those in the homebound group, made at the time of their interview (and written down by the interviewers) showed that financial pressure and worries were indeed important barriers to their having desired level of socialization. Next to health problems and disability, lack of money was frequently listed as the reason for not being able to go out much and do things (e.g., “takes money to do things,” “haven’t got the money; car doesn’t work,” “financial problems; can barely pay bills,” “don’t socialize because financial pressure is weighing on me,” and “prices goes up for everything”).

An insecure financial situation, physical and functional health problems, and loneliness remained significant correlates of depressive symptoms when social support, religiousness, and physical exercise as coping resources were added to the multivariate regression model. As mentioned, the coping resources appear to mitigate the effect of financial situation and functional impairment, but intensify the effect of loneliness on depressive symptoms. Obviously, the depressogenic effects of financial worries and functional impairment cannot be all eliminated by coping resources. However, when the coping resources were added to the model, the homebound state was no longer a significant factor, showing that the coping resources buffered the effect of the homebound state on depressive symptoms. The perceived burden of dependence on others also became nonsignificant (from being marginally significant), while the number of stressful life events became significant. As delineated in the stress-coping model, life events/situations, appraisal, and coping are inevitably intertwined. Even though homebound state by itself may be a depression risk factor, it is no longer a risk factor when coping resources and coping are accounted for. On the other hand, the impact of stressful life events on depressive symptoms may be pronounced only when they are examined in the context of individuals’ coping resources. Stressful life events may be depressogenic, especially when actual and perceived social support is lacking, because the distress is not buffered by social support. At the same time, strong social support may also exacerbate the stressful effect of a certain life event (see Krause, 1995). For example, a child’s leaving home can be a stressful event that may lead to depression if that child had been the older parents’ sole source of emotional and instrumental help, while it can be associated with their sense of relief and freedom if that child had been a dependent who demanded a lot of assistance from them. The intensified effect of the feeling of loneliness may also be attributable to the similar dynamics of social support.

In addition to the mediating effect of social support, however, the findings show that it is independently correlated with depressive symptoms. As expected, higher levels of family support are associated with lower GDS scores. However, higher levels of support from neighbors are associated with higher GDS scores. It is possible that older adults may be not comfortable with actual or perceived social support from neighbors, especially if they are not able to reciprocate such support because of disability or financial constraints. Social support from friends was not significantly associated with depressive symptoms. Thus, the findings show that different sources of social support are differently associated with depressive symptoms.

Unlike the findings of previous studies that showed an independent association between religiousness and depression outcome (Bosworth et al., 2003; Koenig et al., 2004; Wink et al., 2005), neither frequency of attendance at religious services or praying as coping strategy was significantly directly associated with depressive symptoms when entered with the social support variables. At the time of their interview, many respondents commented that their faith in God was helping them get through tough times and sadness. However, even praying in times of “feeling sad, depressed, and down in the dumps,” which is more likely to reflect “faith in God” than is frequency of attendance at religious services (given that many homebound older adults could not attend services even if they wanted to), was not found to be independently correlated with depressive symptoms.

Parallel to the findings of previous studies, engagement in moderate or vigorous exercise at least three times a week, but not moderate or vigorous exercise once or twice a week, was found to be directly significantly correlated with lower depressive symptoms for all respondents. Although nearly a quarter of homebound older adults reported that they did not exercise for health reasons, those who did apparently had lower depressive symptoms. (The interaction term between the respondent status and exercise was not significant.) Because this was a cross-sectional study, the causal direction between exercise and depressive symptoms could not be established. Rather than exercise having had a direct effect on preventing or reducing depressive symptoms, depressed people may have been less likely to engage in exercise because of their depression. Nevertheless, we cannot ignore the significant direct association between exercise and self-reported depressive symptoms. Previous studies that showed that different types, levels, or settings of exercise have different effects on depressive symptoms (see Holland et al., 2005; Pennix et al., 2002; Regan et al., 2005; Timonen et al., 2002). This study’s findings show that the frequency of exercise is also a significant factor. To have an effect on depressive symptoms, exercise needs to be done at least three times a week.

In conclusion, the depression rate (24.2% of all the study sample members and 42% of the home-bound group) is very high. Moreover, even among the depressed respondents, only a small proportion sought professional help, and that was largely limited to consulting their regular physician and social workers, who may not have had proper training in mental health interventions. The mobility limitations of homebound older adults may have restricted their access to other types of treatment even if they had wanted to try them. Although almost all of the depressed showed mild to moderate levels of symptoms, previous studies showed that mild to moderate depressive symptoms can be as detrimental to the quality of life as severe depressive symptoms (Beekman, et al. 1997; Cuijpers, de Graff, & van Dorsselaer, 2004; Lewinsohn, Solomon, Seeley, & Zeiss, 2000).

Based on our findings, we recommend implementation of the following economically feasible community-based depression prevention and treatment programs: (1) Peer volunteer-monitor program: Senior center participants who are healthy and active need to be trained as friendly visitors for their homebound neighbors to provide companionship, monitor physical and mental conditions, and function as liaisons between homebound neighbors and social service and health care organizations in the community. The peer volunteer-monitor can also encourage homebound older adults to engage in exercise routines

and introduce them to in-home exercise programs that are specifically designed for frail older adults. (2) Social service organizations can institute organized outreach programs through which neighborhood church members and other volunteers offer regular social interactions with isolated, homebound older adults. (3) Elder service organizations such as local Meals on Wheels programs, home health service agencies, and visiting nurses associations can distribute exercise videos specially designed for frail homebound older adults. (4) Senior centers can provide weekly or monthly transportation services for homebound older adults to enable them to attend social and treatment groups at senior centers such as bereavement groups, support groups, and current event discussion groups. (5) In-home professional mental health services should be made more available and accessible for homebound older adults. Short-term cognitive behavioral therapies as well as guided cognitive bibliotherapies that have been proven effective for late-life depression are economic ways to provide treatment for depression in both ambulatory and homebound older adults (Blazer, 2003; McDougall, Blixen, & Suen, 1997; Scogin, Jamison, & Davis, 1990; Scogin & McElreath, 1994). (6) Strengthening family social support, if possible, also appears to be an important intervention strategy.

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Table I.

Characteristics of Sample.

	Senior center participants (<i>n</i> = 130)	Homebound respondents (<i>n</i> = 81)
Age (in 2005) ***	71.92 (7.20)	76.21 (9.19)
60–69 (%)	40.8	27.2
70–79 (%)	42.3	30.9
80 and older (%)	16.9	42.0
Percentage female	83.8	76.5
Race/ethnicity (%) ***		
African American	40.8	27.2
Hispanic	38.5	13.6
Non-Hispanic white	20.8	59.3
Marital status (%) **		
Married	29.2	8.6
Widowed	43.1	54.3
Divorced/separated	23.8	33.3
Never married	3.8	3.7
No. of children [†]	3.82 (2.56)	3.15 (2.68)
Level of education (%) *		
Less than high school	30.0	28.4
Some high school	15.4	4.9
High school graduate or equivalent	23.8	19.8
Some college	21.5	25.9
2- or 4-year college degree	6.9	11.1
Some or completed graduate school	2.3	9.9
Median annual household income range (\$)	10,001–12,500	10,001–12,500
Financial situation (%) **		
Cannot make ends meet	5.4	14.8
Just about manage to get by	44.6	53.1

	Senior center participants (<i>n</i> = 130)	Homebound respondents (<i>n</i> = 81)
Have enough to get along, and even have a little extra	34.6	27.2
Money is not a problem; can buy pretty much anything (that I/we want)	15.4	4.9
No. of diagnosed chronic medical conditions ★★★	2.41 (1.32)	3.26 (1.66)
No. of diagnosed chronic medical conditions that are still problems ★★★	1.96 (1.28)	2.60 (1.55)
No. of ADL impairments ★★★	0.10 (0.37)	0.56 (1.08)
No. of IADL impairments ★★★	0.42 (0.85)	1.72 (1.12)
Percentage ever having been treated by healthcare professional for depression, anxiety, or other mental health problems in lifetime	27.7	33.3
No. of life events in the preceding 2 years	2.38 (1.45)	2.89 (1.48)
No. of life events that were stressful	1.52 (1.27)	1.86 (1.46)
Current serious problems (%)		
Not having enough money to live on ★★★	27.7	53.1
Loneliness or not having enough friends ★★	10.0	24.7
Having to depend too much on other people ★★★	9.2	40.7
Having too many problems or conflicts in the family	16.2	21.0
Social Support Network Scale-Family ★★	18.20 (5.90)	15.60 (6.09)
Social Support Network Scale-Neighbors	11.35 (6.03)	9.99 (5.87)
Social Support Network Scale-Friends ★★★	14.37 (6.54)	10.23 (5.92)
Religiosity (%)		
Service attendance ★★★		
Never	5.4	40.7
Less than once a year	1.5	8.6
Once a year	0.8	2.5
Several times a year	2.3	13.6
Once a month	3.1	3.7
Several times a month	9.2	9.9
Once a week	50.8	17.3
More than once a week	26.9	3.7

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	Senior center participants (<i>n</i> = 130)	Homebound respondents (<i>n</i> = 81)
Pray frequently	73.8	61.7
Exercise		
Moderate/vigorous exercise at least 3 times a week	63.1	37.0
Moderate/vigorous exercise 1–2 times a week	25.4	11.1
Do not do for health reasons	3.8	27.2
Do not exercise (for reasons other than health)	7.7	24.7
Geriatric Depression Scale (GDS) score	1.96 (2.25)	4.60 (3.26)
0–4 (%)	87.9	58.0
5–15 (%)	13.1	42.0

(): Standard deviation of the mean.

*** $p < 0.001$

** $p < 0.01$

* $p < 0.05$

[†] $p < 0.10$: Denote significant difference between senior center and homebound participants.

Table II.

Risk and Protective Factors for Depression: OLS Regression Results.

VARIABLE	Step 1		Step 2	
	B (SE)	Beta	B (SE)	Beta
RESPONDENT STATUS				
Homebound respondents (Senior center participants)	1.071 (0.445)★	0.176	0.293 (0.489)	0.048
DEMOGRAPHICS				
Age	-0.026 (0.023)	-0.075	-0.010 (0.022)	-0.029
Race/ethnicity				
African American	-0.364 (0.405)	-0.059	-0.187 (0.441)	-0.030
Hispanic (Non-Hispanic white)	0.233 (0.481)	0.036	0.448 (0.473)	0.069
Female	-0.142 (0.417)	-0.019	-0.234 (0.401)	-0.031
Married	-0.001 (0.415)	-0.001	0.115 (0.394)	0.016
Level of education	0.041 (0.118)	0.021	0.004 (0.116)	0.002
Financial situation (1-4)	-0.592 (0.217)★★	-0.162	-0.462 (0.207)★	-0.126
HEALTH AND LIFE STRESSORS				
Number of medical conditions	0.298 (0.118)★	0.142	0.277 (0.114)★	0.132
Number of ADL/IADL impairments	0.364 (0.124)★★	0.193	0.268 (0.118)★	0.143
Have ever received mental health treatment	0.785 (0.373)★	0.121	0.590 (0.351) [†]	0.091
Number of stressful life events (in preceding 2 years)	0.197 (0.125)	0.090	0.264 (0.121)★	0.120
Serious problem of loneliness	1.633 (0.470)★★★	0.200	1.983 (0.451)★★★	0.243
Too much dependence on others	0.835 (0.446) [†]	0.115	0.597 (0.428)	0.082
SOCIAL SUPPORT, RELIGIOUSNESS, AND EXERCISE				
Social Support Network Scale-Family			-0.083 (0.029)★★	-0.169
Social Support Network Scale-Neighbors			0.054 (0.026)★	0.108
Social Support Network Scale-Friends			-0.006 (0.027)	-0.014
Frequency of attendance in religious services			-0.135 (0.082)	-0.118
Pray frequently when sad, blue, depressed			0.344 (0.375)	0.053

VARIABLE	Step 1		Step 2	
	<i>B</i> (<i>SE</i>)	Beta	<i>B</i> (<i>SE</i>)	Beta
Physical exercise				
At least 3 times weekly			-1.594 (0.410) ***	-0.269
1–2 times weekly (Do not exercise)			-0.669 (0.472)	-0.090
Constant	3.976 (1.850) *		5.118 (1.820) **	
<i>R</i> ²	0.457		0.545	
Adjusted <i>R</i> ²	0.419		0.495	

Note: $N = 211$. The change in R^2 from the step 1 model to the step 2 model was statistically significant at $p < 0.001$.

*** $p < 0.001$

** $p < 0.01$

* $p < 0.05$

† $p < 0.10$

Self-Reported Coping Strategies When, ‘Feeling Sad, Depressed, or Down in the Dumps’.

Table III.

	Senior center participants	Homebound respondents	Nondepressed respondents	Depressed respondents
Pray frequently	73.8 [‡]	61.7	71.3	62.7
Watch TV/listen to music	60.8	63.0	58.8	70.6
Talk to spouse/family members	57.7 [★]	39.5	53.8	41.2
Talk to friends/co-workers	51.5 [‡]	37.0	46.9	43.1
Wait and hope the problem goes away	28.5	32.1	28.8	33.3
Go on a long walk	36.2 ^{★★★}	9.9	28.1	19.6
Have crying spells	25.4 [‡]	13.6	16.3 ^{★★★}	35.3
Brood and continue worrying	9.2 ^{★★}	24.7	6.9 ^{★★★}	41.2
Eat more than usual	19.2	13.6	16.3	19.3
Withdraw from others	10.0 [‡]	18.5	8.8 ^{★★★}	27.5
Sleep a lot	8.5	14.8	7.5 ^{★★★}	21.6
Get going	10.8 [★]	2.5	8.8	3.9
Go shopping	9.2	3.7	8.1	3.9
Think positively	2.4 [★]	8.9	2.5 [★]	11.8
Read a book	7.7	8.6	8.8	5.9
Do exercise	3.8	2.5	4.4	0
Work crossword puzzles	3.9	5.1	5.6	0
Sew/Quilt	4.7	3.8	5.0	2.0
Play with great (grand) children/neighbors	3.1	2.5	3.1	2.0
Drink beer, wine, or liquor more than usual	2.3	2.5	1.3 [‡]	5.9
Talk to clergy	17.7 ^{★★}	3.7	14.4	5.9
Read the Bible	5.4	2.5	3.8	5.9
Consult regular physician	12.3	13.6	9.4 ^{★★}	23.5
Get prescription from doctor and take medicine	10.0	12.3	8.1 [★]	19.6

	Senior center participants	Homebound respondents	Nondepressed respondents	Depressed respondents
Talk to a social worker	3.1 ★★	12.3	4.4 ★	13.7
Talk to a psychiatrist/psychologist	4.6	4.9	3.8	7.8
Buy over-the-counter drugs to soothe the nerves	2.3	1.2	1.9	2.0
Visit faith healer, medicine man, other folk healer	0.8	0	0.6	0

Notes: Other coping strategies mentioned by a few respondents: call the crisis hotline; clean house; go for a drive; go fishing; mow/plant; draw; raise pets; and play with the computer.

★★ $p < 0.001$

★ $p < 0.01$

★ $p < 0.05$

[†] $p < 0.10$:

Denote statistically significant difference between senior center and homebound participants and between those who were not depressed (GDS < 4) and those who were depressed (GDS = > 5).