Depression is highly prevalent in nursing homes, affecting approximately 30% to 40% of residents (Kerber, Dyck, Culp, & Buckwalter, 2005; Teresi, Abrams, Holmes, Ramirez, & Eimicke, 2001). The projected growth of the nursing home population from 1.6 million in 2004 to 3.1 million by 2030 will only serve to magnify the problem (Johnson, 2005). Despite the high prevalence of depression identified in research studies, depression remains underrecognized in many U.S. nursing homes (Beyer, 2007; Brown, Lapane, & Luisi, 2002; Davidson, Kortitsas, O’Connor, & Clarke, 2006). Failure to detect depression in older adults may stem from inadequate training in geriatric mental health among providers, the complexity of patients’ clinical presentations, and a tendency for patients to deny or somatize psychological symptoms (Alexopoulos et al., 2002; Kales & Valenstein, 2002). In addition, older adults may not experience classic sadness or depressed mood (Gallo & Rabins, 1999). Presenting symptoms may include insomnia, fatigue, lack of interest in personal care, psychomotor agitation or retardation, weight loss, somatic complaints, loss of feeling of pleasure, hopelessness, helplessness, irritability, and memory complaints (Gallo & Rabins, 1999; Husain et al., 2005; Thakur & Blazer, 2008). A final barrier to the detection of depression in nursing homes is the relative lack of mental health clinicians; a six-state study found mental health clinicians present in only 41.7% of the 2,128 facilities surveyed (Lapane & Hughes, 2004).

Prompt recognition and treatment of depression is imperative to limit the sequelae associated with depression in long-term care. Aside from effects on quality of life, depression has been linked to cognitive and functional decline, as well as increased rates of falls, medical comorbidity, health service utilization, hospitalization, nursing home placement, suicide, and overall mor-

**Indicators of a NEW DEPRESSION DIAGNOSIS in Nursing Home Residents**

**ABSTRACT**

Depression affects approximately 30% to 40% of nursing home residents but frequently goes unrecognized. Using the Missouri Minimum Data Set, we aimed to determine whether changes in clinical status, other than mood changes, were associated with new depression diagnosis in residents 65 and older without a recorded depression diagnosis. Of 127,587 potential participants, 14,371 met inclusion criteria and were not depressed at baseline (Time 0). At the next quarterly assessment (Time 1), 1,342 (9.3%) had acquired a new diagnosis of depression. Residents with new depression were significantly younger and less cognitively impaired. Nearly 30% had a decline in activities of daily living (ADL) performance. The multivariate model predicting depression showed that increased verbal aggression, urinary incontinence, increased pain, weight loss, change in care needs, cognitive decline, and ADL decline significantly increased the likelihood of new depression diagnosis. The pattern of decline identified here may provide additional clues to the presence of underlying depression.
Detecting depressive symptoms early in their course may provide a window of opportunity to try psychosocial interventions before advancing to pharmacotherapy, a treatment that is often fraught with side effects and poor response in older adults (Alexopoulos, 2003; Alexopoulos et al., 2008).

BACKGROUND

Generally regarded as the gold standard for the diagnosis of depression, formal psychiatric assessments based on Diagnostic and Statistical Manual of Mental Disorders, fourth edition, text revision (DSM-IV-TR; American Psychiatric Association, 2000) criteria may be impractical for widespread use in nursing home practice due to the cost, time, and skill level required to administer (Burrows Morris, Simon, Hirides, & Phillips, 2000; Davidson et al., 2006). In contrast, screening instruments, such as the Geriatric Depression Scale (GDS) (Yesavage et al., 1982-1983), typically rely on self-report of symptoms, the validity of which is questionable in individuals with compromised cognitive functioning (McGivney, Mulvihill, & Taylor, 1994). The Cornell Scale for Depression in Dementia (CSDD) (Alexopoulos, Abrams, Young, & Shamolian, 1988) has been validated for use in individuals with dementia, but because it relies on the semi-structured interview of an informed caregiver, its validity in the nursing home setting may be threatened. For these reasons, other means of detecting depression are needed to address the problem of underdiagnosis.

The Minimum Data Set (MDS), a standardized reporting form enacted by the Omnibus Budget Reconciliation Act of 1987, provides a comprehensive assessment of residents’ functional, medical, psychosocial, and cognitive status and is completed in full on admission and annually, with full or partial updates at least quarterly or after significant change in clinical status (Centers for Medicare & Medicaid Services [CMS], 2008; Morris et al., 1990). Originally intended to improve care planning processes, the MDS is now also used by researchers to study a variety of clinical problems encountered in nursing homes. Because all facilities requesting Medicare and Medicaid funding must complete the MDS, using MDS indicators to identify features of depression in older residents would not place additional burden on staff. The MDS has demonstrated reliability in several domains (cognition, activities of daily living [ADL], communication, continence, and diagnosis), although the mood and behavior items have not been as reliable (Frederiksen, Tariot, & De Jonghe, 1996; Hawes et al., 1995; Lawton et al., 1998). The MDS has undergone several revi-
sions; currently, MDS version 2.0 is in use in the United States.

MDS clinical data that have been linked to diagnosed depression in nursing home residents include cognitive impairment, functional disability, pain, uriinary incontinence, physical and verbal aggression, weight loss, and more time spent in bed and less time in activities (Blaum, Fries, & Fiatarone, 1995; Gruber-Baldini et al., 2005; Harralson et al., 2002; Jumadilova, Zyczynski, Paul, & Narayanan, 2005; Leonard, Tinetti, Allore, & Drickamer, 2006; Simmons et al., 2004). Demographic factors including age, gender, marital status, education, and ethnicity have also been significantly associated with a greater prevalence of identified depression (Jones, Marcantonio, & Rabinowitz, 2003; Levin et al., 2007). Although identification of these factors is important to understand the relationships among risk factors, health status, and depression, the majority of studies on MDS data has been cross-sectional, and thus did not examine whether a change in clinical status occurred parallel to the development of depression.

Assuming that some observable change in resident status prompts providers to diagnose depression, knowing which changes commonly occur may help nurses and other health care providers detect depression sooner rather than later. Therefore, for the purpose of developing a list of observable indicators of new depression that would be useful to nurses practicing in long-term care, we examined the MDS to identify changes in specific resident characteristics during any quarter of nursing home residence (excluding the quarter immediately following admission) that were associated with a new diagnosis of depression. The research question for this study was: To what extent are the following variables significantly associated with a new diagnosis of depression in established nursing home residents: age, gender, ethnicity, marital status, education, change in cog-

### Table 1

<table>
<thead>
<tr>
<th>Variable</th>
<th>MDS Item</th>
<th>Coding for Current Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression diagnosis at</td>
<td>I1ee, O4c</td>
<td>No depression = 0&lt;br&gt;Checkmark in I1ee = 1&lt;br&gt;Number in O4c = 1</td>
</tr>
<tr>
<td>Time 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>AA3</td>
<td>Age in years</td>
</tr>
<tr>
<td>Gender</td>
<td>AA2</td>
<td>Male = 0&lt;br&gt;Female = 1</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>AA4</td>
<td>American Indian or Alaska Native&lt;br&gt;Asian/Pacific Islander&lt;br&gt;Black or African American&lt;br&gt;Hispanic&lt;br&gt;White or Caucasian</td>
</tr>
<tr>
<td>Marital status</td>
<td>A5</td>
<td>Never married&lt;br&gt;Married&lt;br&gt;Widowed&lt;br&gt;Separated/divorced</td>
</tr>
<tr>
<td>Level of education</td>
<td>AB7</td>
<td>Less than high school&lt;br&gt;High school graduate and above</td>
</tr>
<tr>
<td>Activities of daily living</td>
<td>G1a, G1b, G1e, G1g, G1h, G1i, G1j</td>
<td>Independent = 0&lt;br&gt;Supervision = 1&lt;br&gt;Limited assistance = 2&lt;br&gt;Extensive assistance = 3&lt;br&gt;Total dependence = 4</td>
</tr>
<tr>
<td>Activity involvement</td>
<td>N2</td>
<td>Most (more than two thirds of the time) = 3 &lt;br&gt;Some (one third to two thirds of the time) = 2 &lt;br&gt;Little (less than one third of the time) = 1 &lt;br&gt;None = 0</td>
</tr>
<tr>
<td>Aggression, physical</td>
<td>E4c</td>
<td>Behavior of this type not exhibited in past 7 days = 0&lt;br&gt;Behavior of this type occurred 1 to 3 days in past 7 days = 1&lt;br&gt;Behavior of this type occurred 4 to 6 days in past 7 days, but less than daily = 1&lt;br&gt;Behavior of this type occurred daily = 1</td>
</tr>
<tr>
<td>Aggression, verbal</td>
<td>E4b</td>
<td>Behavior of this type not exhibited in past 7 days = 0&lt;br&gt;Behavior of this type occurred 1 to 3 days in past 7 days = 1&lt;br&gt;Behavior of this type occurred 4 to 6 days in past 7 days, but less than daily = 1&lt;br&gt;Behavior of this type occurred daily = 1</td>
</tr>
<tr>
<td>Bladder continence</td>
<td>H1b</td>
<td>No incontinence = 0&lt;br&gt;Incontinence episodes once per week or less = 1&lt;br&gt;Incontinent two or more times per week but not daily = 2&lt;br&gt;Tends to be incontinent daily but some control present = 3&lt;br&gt;Incontinent most of the time = 4</td>
</tr>
<tr>
<td>Care needs</td>
<td>Q2</td>
<td>No change = 0&lt;br&gt;Improved, receives less support = 0&lt;br&gt;Deteriorated, receives more support = 1</td>
</tr>
</tbody>
</table>
nitive functioning, change in ADL functioning, change in urinary incontinence, increased physical and verbal aggression, weight loss, increased pain, less time spent in activities, and less time awake?

**METHOD**

This was a secondary analysis using the Missouri MDS (Data Use Agreement #8728). Approval for these secondary analyses was obtained from the Missouri Department of Health and Human Services and the University Institutional Review Board.

**Data Source**

The dataset for the proposed study was derived from Missouri MDS data collected between January 1, 2003 and March 31, 2005. CMS mandates that an MDS assessment takes place on admission, quarterly, and annually. The comprehensive (8-page) version is used at admission, annually, and when there has been a significant change in the resident’s status. The short (3-page) version is completed every 3 months, beginning 3 months after admission. The MDS includes information on cognitive patterns, communication, mood and behavior, physical functioning, psychosocial well-being, various symptoms, active clinical diagnoses, and treatments.

**Study Population**

For the period January 1, 2003 to March 31, 2005, the MDS database consisted of assessments for 127,587 Missouri nursing home residents. To identify older long-stay residents who acquired a depression diagnosis following admission to the nursing home, we excluded residents:

- In a hospital-based skilled nursing facility.
- Without two assessments spaced approximately 90 days apart (excluding admission and discharge assessments).
- With an existing diagnosis of depression.

- Already taking an antidepressant medication at the time of the first included assessment.
- Younger than 65 at the time of the first included assessment.
- Who were comatose.
- With severe cognitive impairment.

Due to the exclusions listed above, the sample population was reduced to 14,371 residents.

**Depression Diagnosis**

For the purpose of identifying (a) residents with no prior diagnosis of depression for the initial sample and (b) the subset of participants acquiring a depression diagnosis on their follow-up MDS assessment, depression was defined by a positive depression diagnosis in Item I1ee or use of antidepressant medication in Item O4c. The positive predictive value for the MDS diagnosis of depression, when compared against the same diagnosis on hospital claims, was 0.60 (95% confidence interval [CI] = 0.569 to 0.629) (Gambassi et al., 1998). Due to historically poor performance of the MDS mood indicators, these items were not used to define depression (Anderson, Buckwalter, Buchanan, Maas, & Imhof, 2003; Hendrix, Sakauye, Karabatsos, & Daigle, 2003).

**Predictor Variables**

Table 1 displays a list of all study variables with the respective MDS items and coding for the current study. Demographic characteristics included age, gender, race/ethnicity, marital status, and level of education. Other individual MDS items considered as potential predictors of new depression were the following:

- Activity involvement.
- Physical aggression (i.e., others were hit, shoved, scratched, sexually abused).
- Verbal aggression (i.e., others were threatened, screamed at, cursed at).
- Bladder incontinence.
- Change in care needs.
- Time awake.
- Weight loss.

---

**TABLE 1 (CONTINUED)**

**STUDY VARIABLES AND CORRESPONDING MINIMUM DATA SET (MDS) ITEMS**

<table>
<thead>
<tr>
<th>Variable</th>
<th>MDS Item</th>
<th>Coding for Current Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognition (MDS Cognition Scale)</td>
<td>B2a, B2b, B3a, B3c, B3b, B3d, B4, C4, G1g</td>
<td>Cognitively intact/mild impairment = 0, 1 Mild-moderate impairment = 2, 3, 4 Moderate-severe impairment = 5, 6, 7, 8 Severe-very severe impairment = 9, 10</td>
</tr>
<tr>
<td>Pain (MDS Pain Scale)</td>
<td>J2a, J2b</td>
<td>No pain: J2a = 0 Mild pain: J2a = 1 Moderate pain: J2a = 2 and J2b = 1 or 2 Excruciating pain: J2a = 2 and J2b = 3</td>
</tr>
<tr>
<td>Time awake</td>
<td>N1</td>
<td>Awake all day = 3 Awake two portions (morning, afternoon, evening) of the day = 2 Awake one portion of the day = 1 Not awake during the day = 0</td>
</tr>
<tr>
<td>Weight loss (i.e., 5% or more in past 30 days or 10% or more in past 180 days)</td>
<td>K3a</td>
<td>No = 0 Yes = 1</td>
</tr>
</tbody>
</table>
For all the aforementioned MDS items, the weighted kappa score was 0.65 or greater, except for change in care needs and time awake, which do not have published values (Mor et al., 2003; Morris et al., 2003). MDS indicators of depression, anxiety, and sad mood (Item E1) were excluded from the list of potential predictors because our aim was to identify indicators of depression above and beyond the traditional signs and symptoms of depression.

MDS summary scales used in this study included the Activities of Daily Living Long Form (MDS ADL-Long Form) (Morris, Fries, & Morris, 1999), Cognition Scale (MDS-COGS) (Hartmaier, Sloane, Guess, & Koch, 1994), and Pain Scale (Fries, Simon, Morris, Flodstrom, & Bookstein, 2001). The MDS ADL-Long Form represents a sum of seven ADL items rated on a scale of 0 to 4, with higher scores indicating greater dependence. The reported alpha (Kuder-Richardson Formula 20) internal consistency was 0.94 (Morris et al., 1999). The MDS-COGS is a cognitive index based on eight MDS items encompassing cognitive functioning, communication ability, and self-care ability. The MDS-COGS is scored from 0 to 10, with higher scores associated with worse cognitive performance. When compared with the well-established MDS Cognitive Performance Scale (Morris et al., 1994), the MDS-COGS demonstrated higher correlations with the Mini-Mental State Examination (Folstein, Folstein, & McHugh, 1975) ($r = –0.75$ versus $r = –0.71$) and higher internal consistency (Cronbach’s alpha coefficient = 0.85 versus 0.70) (Cohen-Mansfield, Taylor, McConnell, & Horton, 1999; Gruber-Baldini, Zimerman, Mortimore, & Magaziner, 2000). The MDS Pain Scale was derived from ratings for frequency and intensity of the MDS item pain symptoms, using a tree-based splitting approach. The MDS Pain Scale explained 56% of the variance in pain rated on a visual analog scale (Fries et al., 2001).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Time 0 (Baseline)</th>
<th>Time 1 (New Depression: $n = 1,342$)</th>
<th>Time 1 (No New Depression: $n = 13,029$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>85.2 (8.1)</td>
<td>84.4 (8.0)</td>
<td>85.2 (8.1)</td>
</tr>
<tr>
<td>MDS Cognition Scale</td>
<td>4.5 (1.7)</td>
<td>4.3 (1.6)</td>
<td>4.5 (1.7)</td>
</tr>
<tr>
<td>MDS ADL-Long Form Scale</td>
<td>12.2 (8.9)</td>
<td>11.8 (8.3)</td>
<td>12.2 (8.9)</td>
</tr>
<tr>
<td>Female gender</td>
<td>10,659 (74.2)</td>
<td>75</td>
<td>74.1</td>
</tr>
<tr>
<td>Marital status ($n = 14,328$)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never married</td>
<td>1,505 (10.5)</td>
<td>8.36</td>
<td>10.7</td>
</tr>
<tr>
<td>Married</td>
<td>2,656 (18.5)</td>
<td>21.6</td>
<td>18.2</td>
</tr>
<tr>
<td>Divorced/separated</td>
<td>1,072 (7.5)</td>
<td>7.4</td>
<td>7.4</td>
</tr>
<tr>
<td>Widowed</td>
<td>9,095 (63.5)</td>
<td>62.7</td>
<td>63.6</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>1,654 (11.5)</td>
<td>89.6</td>
<td>87.5</td>
</tr>
<tr>
<td>White</td>
<td>12,606 (87.7)</td>
<td>11.7</td>
<td>9.5</td>
</tr>
<tr>
<td>Other$^a$</td>
<td>111 (0.8)</td>
<td>0.82</td>
<td>0.77</td>
</tr>
<tr>
<td>Level of education ($n = 13,899$)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than high school</td>
<td>5,900 (42.4)</td>
<td>40.9</td>
<td>42.6</td>
</tr>
<tr>
<td>High school/technical training</td>
<td>5671 (40.8)</td>
<td>41.3</td>
<td>40.8</td>
</tr>
<tr>
<td>More than high school</td>
<td>2328 (16.7)</td>
<td>18.1</td>
<td>16.1</td>
</tr>
</tbody>
</table>

Note. ADL = activities of daily living; MDS = Minimum Data Set.

$^a$ Includes American Indian/Alaska Native, Asian, Pacific Islander, and Hispanic race/ethnicities.
Statistical Analysis

Descriptive statistics (frequencies, means, and standard deviations) were calculated to describe the subset of the Missouri nursing home population used in this analysis. The chi-square test was used to examine associations between categorical predictors and incidence of new depression. The Wilcoxon rank-sum test was used to examine differences in depressed and nondepressed groups with respect to interval and ordinal scale variables. Variables that were clearly not related (those with \( p > 0.1 \)) to the development of depression were excluded from further analysis. Remaining variables were entered in a multiple logistic regression analysis with standard errors calculated using generalized estimating equations (Liang & Zeger, 1986). Independent variables that were not significant at the \( p < 0.05 \) level were excluded and the regression model refit. The logistic regression results are presented in terms of odds ratios (OR) with 95% CIs. All analyses were preformed with SAS/STAT® version 9.2 software.

RESULTS

The study sample at Time 0 (baseline) consisted of the 14,371 residents who did not have a prior diagnosis of depression. The study sample at Time 1 (measured at the next quarterly assessment, approximately 90 days after baseline) was divided into two groups: the group of residents who had acquired a new diagnosis of depression (\( n = 1,342; 9.3\% \) of the sample at Time 0) and the group who had not (\( n = 13,029; 90.7\% \) of the sample at Time 0). Sample characteristics at Time 0, Time 1, and the significance of the differences between the groups are displayed in Table 2. As expected, most residents at Time 0 were women, widowed, and White, with a mean age of 85.2 years. At Time 1, the newly diagnosed residents were significantly younger and less cognitively impaired than those residents who were not diagnosed as depressed.

The percentage of both depressed and nondepressed residents exhibiting change in the variables that were found to be significantly associated with a new diagnosis of depression are depicted in the Figure. The variable in which the largest portion of residents with a new diagnosis of depression experienced a decline was ADL functioning. Nearly 30% of newly diagnosed residents declined in ADL functioning, compared with approximately 20% of those not diagnosed with depression. The variable on which the two groups differed most was change in care needs. Whereas a change in care needs affected just 6% of nondepressed residents, this change affected 13.6% of depressed residents, more than double the rate for the nondepressed group.

Although statistically significant at the \( p \leq 0.10 \) level in the univariate analysis, the variables of race, activity involvement, and time awake were not statistically significant in the first logistic regression model and thus were excluded from the final model. Statistically significant indicators of a new depression diagnosis are presented in Table 3. Residents who were never married were less likely to become depressed than widowed residents (OR = 0.75, 95% CI = 0.60 to 0.94). Older age, measured in 3-year increments, was associated with less risk of developing depression (OR = 0.95, 95% CI = 0.93 to 0.97). The greatest odds of a new depression diagnosis occurred in the group of residents who demonstrated increased verbal aggression (OR = 1.69, 95% CI = 1.31 to 2.19). In other words, compared with residents who did not show an increase in verbal aggression during the previous 90 days, residents who did show an increase were 69% more likely to be diagnosed with depression. Following closely behind increased verbal aggression as noteworthy indicators

![Figure. Percentage of study participants at Time 1 exhibiting change in variables associated with a new depression diagnosis. Note: ADL = activities of daily living.](image-url)
of new depression were the variables of weight loss (OR = 1.66, 95% CI = 1.40 to 1.98) and change in care needs (OR = 1.66, 95% CI = 1.35 to 2.03). Although the odds of acquiring a depression diagnosis increases or decreases in the presence of certain characteristics (e.g., verbal aggression, weight loss), those odds are independent of the prevalence of any particular characteristic. The dissociation between ORs and prevalence is demonstrated in the higher frequency of ADL decline (29%) compared with the lower OR of 1.22 (95% CI = 1.05 to 1.41). Likewise, increased verbal aggression was the strongest of all indicators yet was present in just 5% of newly depressed residents.

**DISCUSSION**

The findings presented in this report are relevant for nurses and other health care professionals involved in the care of nursing home residents. First, symptoms not normally associated with depression (e.g., verbal aggression, change in care needs, increased pain, more incontinence) may, in fact, signal depression. Second, the results confirm that new cases of depression continue to be diagnosed in established nursing home residents, highlighting the importance of continual surveillance for depressive symptoms. Finally, contrary to stereotypical expectations, female gender did not increase the risk of depression, at least for the older age group of this sample.

Our primary finding—that a new diagnosis of depression is associated with a change in (generally worsening of) certain resident characteristics—is consistent with earlier cross-sectional work demonstrating an association between depression and pain, weight loss, aggressive behavior, cognitive impairment, and functional disability. To our knowledge, however, no prior study has investigated the extent to which a change in these factors occurred during the same time period an individual was diagnosed with depression. However, these results do not necessarily support causality. It could be that unrecognized depression had actually preceded the decline in the resident characteristics that we identified as concomitant indicators. Some prior research suggests that depression increases the risk for ADL and cognitive decline (Carbonare et al., 2009; Hays, Steffens, Flint, Bosworth, & George, 2001; Parmelee, Lawton, & Katz, 1998; Paterniti, Verdier-Taillefer, Dufour, & Alpérovitch, 2002), yet other research suggests the reverse is true (Alexopoulos et al., 2002; Callahan et al., 1998; Weinberger, Raue, Meyers, & Bruce, 2009). Although it is not within the scope of this study to decipher the direction of the relationship between depression and the symptom changes we identified, we are able to add to the clinician’s armamentarium of tools for the recognition of depression in nursing home residents.

The second finding of importance relates to the incidence of new depressive symptoms in this population of Missouri nursing home residents. Our results closely match studies in which depression was confirmed by medical diagnosis or by a Structured Clinical Interview (Martin et al., 2008; Weinberger et al., 2009). However, in a study using the GDS to identify new depressive symptoms, an incidence of only 4.7% was found (Smallbrugge et al., 2006). It may be that relying exclusively on screening tools to detect depression may overlook residents whose depression manifests with a different constellation of symptoms.

Finally, contrary to many studies, our study did not find female gender to be a risk factor for depression (Vink, Aartsen, & Schoevers, 2008). One explanation could be that many women already had a diagnosis of depression at the time of nursing home admission; therefore, a new diagnosis would be no more common in women than men at this later stage in life. Alternatively, the life circumstances surrounding nursing home residence may situate both genders in a liminal state between adulthood and death (Shields, 1988).

---

**Table 3**

<table>
<thead>
<tr>
<th>Variable and Corresponding MDS Item</th>
<th>Odds Ratio (95% Confidence Interval)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (3-year increment)</td>
<td>0.95 (0.93 to 0.97)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Widowed (as reference)</td>
<td></td>
<td>0.014</td>
</tr>
<tr>
<td>Never married</td>
<td>0.75 (0.60 to 0.94)</td>
<td>0.012</td>
</tr>
<tr>
<td>Married</td>
<td>1.08 (0.94 to 1.24)</td>
<td>0.293</td>
</tr>
<tr>
<td>Divorced/separated</td>
<td>0.89 (0.71 to 1.12)</td>
<td>0.327</td>
</tr>
<tr>
<td>Increased verbal aggression (E4b)</td>
<td>1.69 (1.31 to 2.19)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Weight loss (K3a)</td>
<td>1.66 (1.40 to 1.98)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Change in care needs: deteriorated (Q2)</td>
<td>1.66 (1.35 to 2.03)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Increased pain (MDS Pain Scale)</td>
<td>1.41 (1.19 to 1.68)</td>
<td>0.0001</td>
</tr>
<tr>
<td>More incontinence (H1b)</td>
<td>1.35 (1.14 to 1.61)</td>
<td>0.001</td>
</tr>
<tr>
<td>Cognitive decline (MDS Cognition Scale)</td>
<td>1.30 (1.10 to 1.53)</td>
<td>0.002</td>
</tr>
<tr>
<td>ADL decline (MDS ADL-Long Form)</td>
<td>1.22 (1.05 to 1.41)</td>
<td>0.008</td>
</tr>
</tbody>
</table>

*Note. ADL = activities of daily living; MDS = Minimum Data Set.  
*Of the original sample at Time 0 (N = 14,371), 56 participants were excluded in the regression analysis due to missing data.*
As noted earlier, the psychometric performance of MDS mood items has not been stellar. Neither the 16 mood items nor the 7-item MDS Depression Rating Scale (Burrows et al., 2000) has corresponded well with validated measures of depressive symptoms, such as the GDS or the CSDD (Anderson et al., 2003; Hendrix et al., 2003; Meeks, 2004). As a result, notable changes related to the assessment of mood symptoms are included in the upcoming revision, MDS 3.0, scheduled to be implemented on October 1, 2010 (CMS, 2009). Replacing the MDS 2.0 mood items is the Patient Health Questionnaire-9 (PHQ-9), a self-report depression instrument based directly on the nine diagnostic criteria for major depressive disorder: depressed mood, loss of interest or pleasure in usual activities, poor appetite or overeating, sleep disturbance, feeling of worthlessness or failure, fatigue, impaired concentration, psychomotor retardation or agitation, and recurrent thoughts of death (Koenke, Spitzer, & Williams, 2001). The PHQ-9 has established validity and reliability in community-dwelling older adults (Klapow et al., 2002) and has undergone extensive national testing under the direction of the CMS (RAND Health Corporation, 2008). For use in the MDS 3.0, the PHQ-9 has been adapted to interview or observation format (PHQ-9 Observation Version). Because the PHQ-9 relies on resident input via interview and maps to DSM-IV-TR criteria for diagnosing depression, this particular MDS revision is expected to improve detection of depressive symptoms in nursing home residents. Future research may show that either or both versions of the PHQ-9 included in the MDS 3.0 improve detection of depressive symptoms and correlate well with a new medical diagnosis of depression. However, for residents who lack or deny typical mood symptoms, the pattern of decline identified in the current study may provide additional clues to the presence of underlying depression.

**LIMITATIONS**

This study has some limitations worth noting. Data quality may be affected by the accuracy with which data were collected and recorded, as well as by the clinical insight and judgment of any informant involved in the MDS assessment process. Delegating authority for completion of the MDS assessment to nurses removed from patient care may result in MDS data that do not represent residents’ true status (Hendrix et al., 2003). In addition, it was assumed that any resident who acquired the medical diagnosis of depression was correctly diagnosed, as it was assumed that any resident without a depression diagnosis did not have depression. We were not able to distinguish facilities with access to geropsychiatric health care professionals from those without, so we could not estimate what effect the availability of these specialists had on the incidence of new diagnoses.

**IMPLICATIONS FOR NURSES**

Recognition of depressive symptoms in long-term care residents has been problematic for nursing and medical staff alike (Brühl, Luijendijk, & Muller, 2007). Teresi et al. (2001) found that nursing home nurses, nurse aides, and social workers recognized depressive symptoms in only 37% to 45% of residents with psychiatrist-diagnosed depression. Compiling results from several studies, Brühl et al. (2007) determined that nurses and nursing assistants recognize true depression in approximately 55% of depressed patients and overrecognize depression in approximately 40% of nondepressed patients. In particular, staff overrecognized depression in patients with more severe pain.

The difficulty that nurses and other health professionals have in recognizing true depression is understandable given that depressive symptoms commonly overlap with symptoms of medical illness. Depression may actually amplify pain and discomfort related to medical conditions (Gaynes, Burns, Tweed, & Erickson, 2002; Kerber et al., 2005). As a result, residents may require treatment for physical complaints as well as depression to achieve optimal mental health. Nurses can play a prominent role in improving mental health care
for nursing home residents. By virtue of their familiarity with residents, nurses are well positioned to recognize and report mood symptoms in conjunction with the symptoms of decline identified in this study. Moreover, nurses can be instrumental in facilitating referrals for psychiatric and/or neuropsychological evaluation as well as monitoring response to treatment. Although beyond the scope of this article, further recommendations for the mental health care of older adults can be found in Flood and Buckwalter’s (2009) recent publication.

Educational programs for care staff and physicians have had success at improving depression detection and treatment and have been well received (Davidson et al., 2006; Eisses et al., 2005). Llewellyn-Jones et al. (1999) found that a shared care intervention involving multidisciplinary consultation, clinical training for practitioners and caregivers, and health education for residents resulted in improved depression outcomes for the intervention group compared with the standard-care control group. Nursing staff interested in additional training have multiple resources from which to choose. For a nominal fee, the University of Iowa’s Iowa Geriatric Education Center offers Depression Training to Promote Nurses as Advocates for Older Adults (http://www.healthcare.uiowa.edu/igec/e-learning/depression-training/), and the University of Iowa College of Nursing offers Evidence-Based Practice Guidelines for the detection of depression (http://www.nursing.uiowa.edu/products_services/evidence_based.htm). The National Guideline Clearinghouse (http://www.guideline.gov) provides guidelines for detecting depression in cognitively intact older adults and in older adults with dementia that can be printed or downloaded free of charge. Finally, the Hartford Institute for Geriatric Nursing website lists resources for continuing education on the topic of depression (http://consultgerinn.org/topics/depression/topic_resources/continuing_education_opportunities).

CONCLUSION

Given that MDS assessment data are available to nurses practicing in the majority of U.S. nursing homes, findings from this study have broad applicability. Knowledge of non-mood symptoms of depression that are unique to nursing home residents can inform depression assessment in clinical practice, the first step toward improving mental health care for this population. By detecting and treating depression early, related symptoms such as verbal aggression, weight loss, increased care needs, pain, incontinence, and cognitive and functional decline may be ameliorated.

REFERENCES


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