Brief Report

The Association Between Quality of Care and Quality of Life in Long-Stay Nursing Home Residents With Preserved Cognition

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A B S T R A C T

Objectives: To assess the overall quality of life of long-stay nursing home residents with preserved cognition, to examine whether the Centers for Medicare and Medicaid Service's Nursing Home Compare 5-star quality rating system reflects the overall quality of life of such residents, and to examine whether residents’ demographics and clinical characteristics affect their quality of life.

Design/measurements: Quality of life was measured using the Participant Outcomes and Status Measures—Nursing Facility survey, which has 10 sections and 63 items. Total scores range from 20 (lowest possible quality of life) to 100 (highest).

Setting/participants: Long-stay nursing home residents with preserved cognition (n = 316) were interviewed.

Results: The average quality-of-life score was 71.4 (SD: 7.6; range: 45.1–93.0). Multilevel regression models revealed that quality of life was associated with physical impairment (parameter estimate = −0.728; P = .04 and depression (parameter estimate = −3.015; P = .01) but not Nursing Home Compare’s overall star rating (parameter estimate = 0.683; P = .12) and not pain (parameter estimate = −0.705; P = .47).

Conclusion: The 5-star quality rating system did not reflect the quality of life of long-stay nursing home residents with preserved cognition. Notably, pain was not associated with quality of life, but physical impairment and depression were.

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structural dimensions of care; therefore, these dimensions require professional evaluation.\textsuperscript{2–4}

The quality of life (QoL) of nursing home residents is being increasingly reflected on. Lawton\textsuperscript{12} theorized that an incremental improvement in environmental quality should lead to a corresponding incremental improvement in the perceived QoL of nursing home residents. In addition, he proposed that residents’ perceptions of their own QoL can be considered a primary outcome of the clinical care, housing, and other services provided by the nursing home in which they live.\textsuperscript{2,3} Noéller and Harel\textsuperscript{7} argued that good quality of care (QC) is a necessary, but not sufficient, condition for good QoL. However, QoL is largely ignored in current nursing home quality indicators, which are based on Donabedian’s Structures-Processes-Outcomes (SPO) approach.\textsuperscript{8} This approach is grounded in the idea that good structure should facilitate good process, and good process should facilitate good outcomes.

Another concern is that few psychometrically validated instruments measure the QoL of nursing home residents in a manner consistent with the issue in this population.\textsuperscript{9,10} Because QoL assessment is based on a person’s own experiences, values, and perceptions, that individual’s responses, rather than the perceptions of family members or caregivers, are considered the gold standard. In the past, QoL instruments have been administered without consideration of nursing home residents’ level of cognition.\textsuperscript{9,10} When used in this way, approximately 40% of the participants do not complete half of the instrument, primarily because of impaired cognition.\textsuperscript{9,10} Measuring overall QoL via self-report may not be possible, because of cognitive impairment, as found by research conducted among nursing home residents in the Netherlands.\textsuperscript{11}

Thus, there is a need for more comprehensive understanding of the QoL of nursing home residents and the factors influencing it. In the United States, the Minimum Data Set (MDS), a mandatory assessment performed on individual nursing home residents, does not include sufficient information on QoL; MDS 2.0 is composed of staff observations and reflections rather than resident reports. In addition, the 5-star quality-rating system used in the United States assesses facilities on the basis of overall, health inspections, staffing, and quality measures, rather than residents’ QoL.\textsuperscript{12} These ratings are provided by the Nursing Home Compare (NHC) Web site by the Centers for Medicare and Medicaid Services (CMS), which provides information on all Medicare/Medicaid-certified nursing homes in the United States.\textsuperscript{12}

From the literature, we see that relationship between QoL and QC in the nursing home setting has not been well established.\textsuperscript{13,14} In an attempt to fill this gap, the present study examines whether QC indicators represent the QoL of residents. We attempted to determine whether the NHC’s rating system reflects residents’ overall QoL. We hypothesized that residents in nursing homes with lower ratings are at greater risk of receiving poor QC and that these individuals would report lower QoL.

We also hypothesized that demographic and clinical characteristics affect the QoL of nursing home residents. Because of the exploratory nature of this study, several demographics (eg, depression, falls) were chosen to ascertain whether they influenced QoL. POSM-NF was created to reflect the QoL of nursing home residents who can express their opinions without restriction due to cognitive impairment.

**Psychometrics**

POSM-NF is an interviewer-administered instrument consisting of 10 sections and 63 items. POSM-NF scores can be calculated for individual items, sections, or as a summary. Each item was scored on a 5-point Likert scale that ranged from “strongly disagree” to “strongly agree.” Section scores averaged all items completed. If more than half of the items in a section were completed, their average was imputed as the score for missing items. If less than half of all items in a section were completed, the entire section was considered missing. The sections in the survey appeared to be consistent, as measured by the Cronbach alpha. Aside from section E (dignity/respect) and Section I (comfort), which had alphas of 0.48 and 0.37, respectively, the remaining 8 sections had Cronbach alphas from 0.63 to 0.84. A detailed description of the contents of POSM-NF is presented in Table 1. The actual POSM-NF survey can be found in the Appendix.

**Matching POSM-NF and MDS 2.0 data**

POSM-NF responses from 251 residents (79.4%) were matched to MDS data using individual identifying data that included name, date of birth, and facility identification number. A flow diagram of the process used to gather POSM-NF and to matching it to MDS data is presented in Figure 1. The matched POSM-NF and MDS data included 3 facility characteristics (NHC’s overall star rating, facility size, and profit status), 3 demographic characteristics (age, gender, and ethnicity), and 6 clinical characteristics (Activities of Daily Living [ADL] Hierarchy Index, presence of pain, bladder incontinence, history of falls, depression, and Cognitive Performance Scale [CPS] score).

**Total POSM-NF score: outcome variable**

Summary scores were calculated as follows: all section scores were summed and the total was multiplied by 2 to obtain a summary score, which ranged from 20 to 100, with 20 indicating the lowest possible QoL and 100 indicating the highest.

**Survey Procedure**

The institutional review board of Michigan Institute for Clinical and Health Research approved this study. Thirty-two (86.5%) of 37 nursing homes in the Detroit area participated in the collection of POSM-NF data. Seventeen interviewers were hired by the DAAA to administer the POSM-NF survey. All of them took part in a day-long training session. Only residents who were willing and able to sign an informed consent form were interviewed. All participants were

### Methods

**POSM-NF Data**

**Structure**

In 2008, the Detroit Area Agency on Aging (DAAA) and the University of Michigan, Institute of Gerontology, designed and deployed a QoL survey, known as the Participant Outcomes and Status Measures—Nursing Facility (POSM-NF) instrument (see the Appendix).

<table>
<thead>
<tr>
<th>Table 1</th>
<th>POSM-NF Survey Structure and Psychometric Properties</th>
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<tbody>
<tr>
<td>Sections (10)</td>
<td>Section Contents</td>
</tr>
<tr>
<td>A</td>
<td>Availability of paid care and supports</td>
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<td>B</td>
<td>Relationship with support workers</td>
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<td>C</td>
<td>Activities and community integration</td>
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<td>D</td>
<td>Personal relationships</td>
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<td>Dignity and respect</td>
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<td>H</td>
<td>Security</td>
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<tr>
<td>I</td>
<td>Comfort</td>
</tr>
<tr>
<td>J</td>
<td>Environment and meals</td>
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</tbody>
</table>

POSM-NF, Participant Outcomes and Status Measures—Nursing Facility.
interviewed in a quiet, private place and were assured that their responses would be kept confidential. The survey period was from January to March 2009. "Eligible" residents were those with a score of 3 or lower on the MDS CPS; this cutoff was chosen to identify individuals who were reasonably capable of understanding and answering the questions posed in the survey. Randomization was achieved by acquiring the date of birth of all residents who met the CPS criterion; residents whose date of birth ended in a 0, 1, 4, or 5 were identified and approached for participation in the survey, until 10% of the eligible residents in the facility had been contacted. On average, the survey took approximately 23 minutes to complete (range: 10–45 minutes). In total, 316 nursing home residents in a facility for 91 days or more were approached to participate in the survey. Five residents were not able to complete the interview, and 48 declined to participate, resulting in a total of 263 (83.2%) completed interviews.

Demographic characteristics
Age was divided into 3 categories: young (49 years or younger), middle aged (50–64 years), and old (65 years or older). Ethnicity was divided into African American and others.

Clinical characteristics
The ADL Hierarchy Index summarizes multiple measures of functionality in the MDS 2.0. It has been typically used after each stage of the disablement process. The ADL Hierarchy index ranged from 0 (no impairment) to 6 (total dependence). Bladder incontinence was determined in the last 14 days. Pain was documented in last 7 days at any place. Depression was self-reported in the last 7 days. A fall was defined as an observed fall accident(s) in the last 180 days. CPS scored ranged from 0 (intact) to 3 (moderate impairment).

Statistical Analysis
All reported P values were 2-tailed, and results with P less than .05 were considered statistically significant. Differences in characteristics between participating facilities and all Detroit nursing homes were examined. One-way analysis of variance and chi-square tests were performed for residents’ POSM-NF total scores by characteristics of facilities and residents. We used multivariate analysis by using total POSM-NF score as the outcome variable. To avoid correlation within clusters (eg, nursing home facility) and
overestimation of significance, this study used multilevel, mixed-effect regression models. Our multilevel regression models included both resident-level and facility-level data. Parameter estimates and P values for each level of covariate were calculated. Both forward and backward stepwise selections methods were used to ensure that the method used for selection of covariates had no impact on the final multilevel regression model. All statistics were performed using SAS statistical software version 9.3 (SAS Institute Inc., Cary, NC).

Results

Facility Characteristics

Two-star facilities were the most common (37.5%, 12/32). Small nursing homes predominated (14/32, 43.0%) as did for-profit facilities (87.5%, 28/32) in study participating nursing homes. All facility characteristics between participating and all metropolitan Detroit area nursing homes were not statistically different. The characteristics of facilities in our study versus all metropolitan Detroit nursing homes predominated (14/32, 43.0%) as did for-profit (87.5%, 28/32) facilities.

Resident’s Demographic and Clinical Characteristics

Residents’ ages ranged from 27 to 100 years. More than half (55.9%) were 65 or older. Of the participants, 57.3% were women and 86.0% were African American; more than half (55.9%, 142/251) were 65 or older. Of the participants, 57.3% were women and 86.0% were African American; more than half (56.3%, 142/251) were 65 or older. Of the participants, 57.3% were women and 86.0% were African American; more than half (56.3%, 142/251) were 65 or older.

Total POSM-NF Scores and Multilevel Regressions of Total POSM-NF Scores

The average total POSM-NF score was 71.4 (SD 7.6; range 45.1–93.0, not presented in tables). The results of multilevel regression models examining the association between total POSM-NF scores and covariates are presented in Table 4. Younger adults were less likely to have a higher total POSM-NF score compared to older adults. Residents were more likely to have a higher total POSM-NF score if they were male compared to female residents. The association between POSM-NF scores and the characteristics of residents was statistically significant in terms of their differences except depression (P = .025). Characteristics of residents are presented in Table 3.
more likely to report lower QoL than older adults; however, it was not statistically significant ($P = .08$). A greater ADL Hierarchy Index was associated with a lower total POSM score (parameter estimate: $-0.728, P = .04$). Therefore, residents with impaired physical independence were more likely to report lower QoL. Among residents who reported depression, had lower total POSM score as well (parameter estimate: $-0.305, P = .78$). The association between NHC’s overall star rating and QoL was not significant (parameter estimate: $0.683; P = .12$). The association between pain and QoL was not statistically significant ($P = .12$). A greater ADL Hierarchy Index showed a significant association with QoL in that impaired physical functioning showed a significant association with lower QoL ($P = .01$). ADL impairment and depression significantly influenced QoL in this population, but pain did not. The major strength of this work is that although previous studies have attempted to link the QoL of nursing home residents to QC indicators, this is the first study to (1) delineate the overall QoL of nursing home residents with preserved cognition and (2) examine whether facility and resident characteristics are linked to residents’ overall QoL. Moreover, the interview response and complete data rates were relatively high, supporting the validity of our findings.

It is noteworthy that pain was not associated with QoL. This finding is in contrast with a recent study that showed an association between pain and well-being measures among nursing home residents.\textsuperscript{10} Another study indicated that shorter nursing home stay was associated with higher pain levels.\textsuperscript{17} A possible reason for the conflicting results is that in the present study, the fact that our sample was drawn from long-stayers might lead to underreporting for pain. Unlike short stayers, who receive predominantly high-acute care (eg, extensive rehabilitation therapy), long stayers receive mostly restorative or simpler nursing care, which might be less likely to set off concomitant therapy-related pain.\textsuperscript{18}

A recent review, as well as a previous study on nursing home residents, found that depression was the key factor that posed an increased risk of poor QoL.\textsuperscript{19,20} In the present study, we found that physical functioning showed a significant association with QoL in that greater physical impairment appeared to lead to greater unhappiness. This finding suggests that long-stayer residents report their QoL on the basis of their physical functioning rather than surrounding structural or environmental factors of nursing home facilities they reside in. Given the large number of residents with intact or borderline intact cognition in our study, our participants may have been more sensitive to environmental changes than those with more impaired cognition would be. Our findings indicate that nursing staff should provide more attentive care to the residents who have lower scores on the ADL index. There’s a possibility that residents with worse ADL function would already receive more nursing care, so they might need some other type of care.

A key contribution of our study is that, to the best of our knowledge, it is the first evaluation of linkage between the overall QoL and QC indicators in nursing home residents with preserved cognition. Our results show that a higher star rating for a nursing home is not associated with better QoL among its residents. NHC’s overall 5-star quality rating system did not reflect individual residents’ overall QoL. Because the present NHC star rating system focuses on structural or environmental factors of nursing home facilities they reside in. The average total POSM-NF score in our study was 71.4 of 100. This is similar to the American Customer Satisfaction Index (ACSI) overall satisfaction scores over the past 18 years, (range: 68.0–78.0).\textsuperscript{21}

Despite its contributions, this study has several limitations. First, the sample was predominantly African American and drawn from a

### Table 4

<table>
<thead>
<tr>
<th>Covariates</th>
<th>Parameter Estimate</th>
<th>$P$ Value</th>
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<tbody>
<tr>
<td>Facility characteristics</td>
<td></td>
<td></td>
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<tr>
<td>Facility characteristics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NHC’s overall star rating (1–5)</td>
<td>0.683</td>
<td>.12</td>
</tr>
<tr>
<td>Facility size (no. of certified beds)</td>
<td>0.857</td>
<td>.46</td>
</tr>
<tr>
<td>Small (0–119)</td>
<td>0.804</td>
<td>.53</td>
</tr>
<tr>
<td>Medium (120–149)</td>
<td>Referent</td>
<td>—</td>
</tr>
<tr>
<td>Large (150 or more)</td>
<td>Nonprofit</td>
<td>–0.517</td>
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<tr>
<td>Profit status</td>
<td>Referent</td>
<td>—</td>
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<tr>
<td>Resident level</td>
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<tr>
<td>Demographics</td>
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<td>Age category, y</td>
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<tr>
<td>Young (49 or younger)</td>
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<tr>
<td>Middle (50–64)</td>
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<td>.78</td>
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<tr>
<td>Old (65 or older)</td>
<td>Referent</td>
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<tr>
<td>Gender</td>
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<td></td>
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<td>Clinical characteristics</td>
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<tr>
<td>ADL Hierarchy Index (0–6)</td>
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<td>.04</td>
</tr>
<tr>
<td>Pain</td>
<td>–0.705</td>
<td>.47</td>
</tr>
<tr>
<td>Bladder incontinence</td>
<td>0.459</td>
<td>.67</td>
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<tr>
<td>Fall</td>
<td>0.366</td>
<td>.76</td>
</tr>
<tr>
<td>Depression</td>
<td>–3.015</td>
<td>.01</td>
</tr>
<tr>
<td>Cognitive Performance Scale (0–3)</td>
<td>0.344</td>
<td>.51</td>
</tr>
</tbody>
</table>

ADL, activities of daily living; NHC, Nursing Home Compare; POSM-NF, Participant Outcomes and Status Measures—Nursing Facility.
metropolitan area. Thus, generalizing our results to other countries or other ethnic/demographic groups must be done with caution. Second, the cross-sectional design prevents us from making inferences of causality, and the reliance on self-reported cross-sectional survey data may have caused under- or overestimation of the actual association of QoL and QC. Third, the POSM-NF does not assess spiritual well-being, which may be particularly important for nursing home residents, especially at end of life.23 Moreover, the data were collected 4 years ago, meaning the results in this study may not reflect the current situation. However, we suggest that continuous evaluation should be conducted to investigate the relationship between QoL and QC measures by the DAAA. Given these limitations, our study should be considered exploratory and our results preliminary.

Nevertheless, we believe our findings will be useful to long term care health policy makers, giving them ideas for several policy initiatives. For instance, the use of resident satisfaction scores represents one means of including the “voice” of nursing home users in quality indicators.21 Further research and policy initiatives aimed at linking QC to QoL in nursing home residents should be initiated to facilitate the inclusion of resident voices into individual resident care plans. This could lead to more customized care, and eventually higher resident satisfaction. To motivate long term care facilities to improve both QC and QoL, federal or local government agencies could consider providing incentives for those facilities that receive accreditation. For instance, the use of resident satisfaction scores represents one means of including the resident voice into individual resident care plans. This could lead to more customized care, and eventually higher resident satisfaction. To motivate long term care facilities to improve both QC and QoL, federal or local government agencies could consider providing incentives for those facilities that receive accreditation from the Joint Commission: Accreditation, Health Care, Certification (JCAHO), because fewer than 5% of long term care facilities are accredited, whereas 95% of hospitals are.21

Conclusion

The 5-star quality rating system did not reflect the quality of life of long-stay nursing home residents with preserved cognition. Notably, pain was not associated with quality of life, but physical impairment and depression were.

Supplementary Data

Supplementary data related to this article can be found at http://dx.doi.org/10.1016/j.jamda.2013.10.012.

References