

Factors Associated With Nursing Assistant Quality-of-Life Ratings for Residents With Dementia in Long-Term Care Facilities

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Purpose: We identify resident, nursing assistant, and facility factors associated with nursing assistant quality-of-life ratings for residents with dementia in long-term care. **Design and Methods:** We used a cross-sectional survey of 143 nursing assistants providing care to 335 residents in 38 residential care/assisted living (RC/AL) facilities and nursing homes in four states. We assessed resident quality of life by using the Quality of Life–Alzheimer’s Disease Scale (QOL-AD). **Results:** Scores on the quality-of-life scale were most strongly associated with resident clinical conditions, including severity of cognitive and functional impairments, depression, and behavioral symptoms of dementia. There was also an independent positive association between nursing assistants’ ratings of resident quality of life and their own attitudes regarding dementia-person-centered care as well as training. However, the results of hierarchical linear modeling suggest that some sources of nursing assistant variability in quality-of-life ratings

remain unidentified. **Implications:** Quality-of-life ratings by nursing assistants may be influenced by their attitudes about dementia and their confidence in addressing residents’ fundamental care needs.

Key Words: Assisted living, Nursing home, Training, Attitudes, Care provider

Ensuring a good quality of life for residents in long-term care represents both an important goal and a difficult challenge (Kane, R. A., 2001). Many factors contribute to a resident’s quality of life, including the organizational culture within the facility, the staff’s quality of care, and the residents’ values, priorities, and perceptions of their functional and cognitive capabilities (Beck, Ortigara, Mercer, & Shue, 1999). As quality of life has become a goal more frequently cited by residents, families, and health care professionals, there have been increasing efforts to conceptualize and accurately measure it. Now, multiple generic and disease-specific quality-of-life measurement instruments have been developed, but the science of quality-of-life measurement remains in its infancy (Kane, R. L., 2001).

Ideally, individuals are in the best position to both define and rate their own quality of life. However, cognitive impairment may prevent residents with dementia from rating their quality of life. Currently, more than 50% of the individuals in nursing homes have dementia, as do 23% to 42% of the individuals in residential care/assisted living (RC/AL) facilities (Zimmerman et al., 2003). Because residents with dementia comprise an enlarging population within long-term care facilities, fostering their quality of life merits particular attention.

Lawton (1994) initially developed a conceptual framework of quality of life in dementia that includes the domains of psychological well-being, behavioral competence, care environment, and perceived quality

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of life. In long-term care facilities, nursing assistants have a critical role in promoting these quality-of-life domains because they deliver the majority of personal care. Because they are in this key position, the perceptions they have about residents are critically important, as their attitudes may well influence the manner in which they provide care. Unfortunately, a recent study of nurses and nurse aides found that the five most prevalent perceptions they held of individuals with dementia were negative: They saw them as being anxious, having little control over their behavior, being unpredictable, being lonely, and being frightened and vulnerable (Brodsky, Draper, & Low, 2003). Complicating this situation, nursing assistants receive minimal resident care training and potentially no dementia-specific education, and they themselves recognize the need for more training; in fact, these workers emphasize that training is important to their ability to provide quality care (Schirm, Albanese, Garland, Gipson, & Blackmon, 2000).

Given their lack of dementia-care training, nursing assistants may rate resident quality of life on the basis of negative biases developed from daily interactions with severely impaired individuals rather than from more balanced observations of residents' remaining capabilities. Thus, nursing assistants may perceive quality of life from their own perspectives instead of from resident-centered observations (Boettcher, Kemeny, DeShon, & Stevens, 2004). Although quality-of-life ratings are ideally based on resident preferences and characteristics, factors related to nursing assistants themselves or the facilities in which they work may become important determinants of how nursing assistants both rate quality of life and make decisions for residents with dementia (Corazzini, McConnell, Rapp, & Anderson, 2004). Our aim in this study is to assess the relationship between resident, nursing assistant, and facility-level characteristics and nursing assistant quality-of-life ratings of long-term care residents with dementia.

Methods

Participants

The individuals in this study were participants in the Dementia Care project of the Collaborative Studies of Long-Term Care (CS-LTC). A total of 421 residents with dementia were recruited from a stratified sample of 35 RC/AL facilities and 10 nursing homes in Florida, Maryland, New Jersey, and North Carolina. The RC/AL facilities ranged from converted family homes with fewer than 16 beds to large, purpose-built facilities. The commonality of all of these facilities is that they are licensed by states at a non-nursing-home level of care and provide room, board, 24-hr oversight, and assistance with daily activities. For each sampled resident, an interview was conducted with the direct care provider who provided hands-on care and was most

familiar with the resident's health and care. The analyses presented here were restricted to the 335 residents who had their quality of life rated by one of 143 nursing assistants. Ninety-six percent of the nursing assistants were certified. There were no statistically significant differences between the 86 residents without a nursing assistant quality-of-life score and those with a score in terms of age, gender, or severity of cognitive impairment. Residents in nursing homes were more likely to have a quality-of-life rating by a nursing assistant than those in RC/AL facilities (90.5% vs 74.3%, $p = .03$). Further details about the sample and data-collection strategies are presented in the introduction to this issue.

Measures

The primary outcome measure was the nursing assistants' rating of resident quality of life, according to the Quality of Life—Alzheimer's Disease scale (QOL-AD; Logsdon, Gibbons, McCurry, & Teri, 2002). This instrument evaluates the following domains: physical condition, mood, interpersonal relationships, ability to participate in meaningful activities, and financial situation. The original instrument contains 13 items and was designed for community-based settings. A modified version more appropriate for long-term care changed the item "marriage relationship" to "relationships with people who work here," "ability to do chores" to "ability to keep busy," and "ability to handle money" to "ability to take care of self." In addition, 2 new items, "ability to live with others" and "ability to make choices in (one's) life," were added (Edelman, Fulton, Kuhn, & Chang, 2005, this issue). The modified QOL-AD includes 15 items, each of which is rated on a 4-point scale (1 = *poor* to 4 = *excellent*), with the total score ranging from 15 to 60. The internal consistency reliability of this measure was excellent ($\alpha = 0.88$) and the interrater reliability was 0.99 (intra-class coefficient, $n = 20$). Further, the care provider QOL-AD ratings were correlated with their quality-of-life scores by use of other established instruments: Ratings were positively correlated with both the positive affect scale ($r = .46$) and the activity scale ($r = .52$) of the Quality of Life in Dementia instrument (Albert et al., 1996), and there was also a strong positive correlation ($r = .68$) with the Alzheimer Disease-Related Quality of Life measure (Rabins, Kasper, Kleinman, Black, & Patrick, 2000). This and other information related to the QOL-AD is reported in this issue (Sloane et al., 2005).

We evaluated variables at three levels (facility, resident, and nursing assistant) for their relationship to nursing assistants' QOL-AD scores. At the facility level, these variables included facility type (RC/AL facility or nursing home) and profit–nonprofit status. At the resident level, in addition to demographic characteristics, we assessed cognitive status by using the Mini-Mental State Exam (MMSE; Folstein,

Folstein, & McHugh, 1975), or the Minimum Data Set Cognition Scale (MDS-COGS; Hartmaier, Sloane, Guess, & Koch, 1994) if an MMSE result was unavailable ($n = 48$). We assessed functional status by using the Minimum Data Set Activities of Daily Living Scale (MDS-ADL; Morris, Fries, & Morris, 1999), depression by using the Cornell Scale for Depression in Dementia (CSDD; Alexopoulos, Abrams, Young, & Shamoian, 1988), pain intensity with the Philadelphia Geriatric Center Pain Intensity Scale (PGC-PIS; Parmelee, Katz, & Lawton, 1991), and behavioral symptoms with the Cohen-Mansfield Agitation Inventory (CMAI; Cohen-Mansfield, 1986). The MDS-COGS, functional status, depression, pain, and behavioral ratings were all provided by a more senior staff member (such as a registered or licensed practical nurse) who supervised the nursing assistant.

We used three established instruments to evaluate nursing assistants' attitudes toward residents with dementia and their work experiences. The Approaches to Dementia instrument assesses attitudes toward caring for people with dementia, and it includes two subscales (Lintern, Woods, & Phair, 2000). Items in one subscale address a respondent's degree of hope for individuals with dementia, and questions in the other subscale assess the degree to which respondents endorse items related to "person-centered care" as opposed to considering that all residents with dementia have the same strengths and limitations. The Staff Experience Working with Demented Residents instrument contains six subscales that measure respondents' satisfaction with their work environment and experiences caring for residents with dementia (Åström, Nilsson, Norberg, Sandman, & Winblad, 1991). Finally, the Work Stress Inventory includes six subscales that assess work experiences during the past 30 days, including relationships with coworkers and satisfaction with work load and scheduling (Schaefer & Moos, 1993). Another article in this issue provides additional details about these three measures (Zimmerman et al., 2005).

Finally, using a series of questions developed for this study, we assessed nursing assistants' confidence in their training to both identify and help residents in multiple domains of dementia care (depression, behavioral symptoms, pain, eating, drinking, mobility, and activity involvement). For each of these areas, staff was asked to rate how well trained they felt both to identify problems affecting their residents (assessment) and to help with those problems (treatment). We scored responses on a 4-point scale and summed them across all areas to compute a training-assessment score and a training-treatment score. We summed these two indices to create an overall training score.

Statistical Analysis

To estimate bivariate associations between facility, resident, and nursing assistant characteristics and QOL-AD scores, we used Pearson correlation

coefficients and means (standard errors) for continuous and categorical measures, respectively. We adjusted the standard errors of the means for resident clustering within nursing assistants and nursing assistants within facilities by using Taylor series expansion methods (Woodruff, 1971). We tested the statistical significance of these associations by using linear mixed models including random effects for facility and nursing assistants nested within facilities.

To examine whether the associations between facility and nursing assistant characteristics and QOL-AD scores were independent of resident characteristics, we estimated partial correlation coefficients and repeated the linear mixed models, adjusting for the resident covariates noted earlier: cognitive status, number of activities of daily living (ADL) disabilities, depressive symptoms, pain severity, and frequency of behavioral symptoms. We selected these covariates because they are likely to influence nursing assistants' perceptions and are often associated with quality-of-life ratings. Indeed, in this study the association of each covariate with the QOL-AD yielded a value of $p < .1$.

We excluded 70 residents from some analyses because data for at least one resident covariate were missing. Comparing residents with and without all covariate data, we found that there were no statistically significant differences in their mean QOL-AD scores (37.0 vs 38.4, $p = .57$), mean MMSE scores (8.3 vs 6.7, $p = 0.90$), gender (82% vs 74% female, $p = .39$), or whether they resided in a nursing home (36% vs 40%, $p = 0.51$) or for-profit facility (68% vs 76%, $p = 0.31$). However, residents with all covariate data available were younger than those with missing covariates (mean age 84.2 vs 86.3 years, $p = 0.02$).

We used a hierarchical linear model to estimate the extent to which variability in QOL-AD scores is explainable by factors related to the resident, to the nursing assistant, and to the facility. The use of a hierarchical model addresses statistical issues involving correlated multilevel data such as these, in which nursing assistants could be caring (and reporting the quality of life) for multiple residents, and study facilities could employ multiple nursing assistants. Our first step in this hierarchical model was to separate the total variability in QOL-AD scores into between-resident, between-nursing assistant, and between-facility components. We accomplished this by fitting a random intercepts model (no fixed effects) that provided estimates of variance and the standard error for each component. We then created a series of models in which resident, nursing assistant, and facility factors were added sequentially to identify significant effects on QOL-AD scores and to explore how the variance partitioning changes upon adding these factors to the regression. After each step, we assessed the change in between-resident, between-nursing assistant, and between-facility variation. If a variance component diminishes substantially after

Table 1. Mean Nursing Assistant Quality of Life–Alzheimer’s Disease Score by Selected Resident Characteristics

Resident Characteristic	No. of Residents	No. of Nursing Assistants	Mean QOL-AD Score (SE) ^a	<i>p</i> ^b
Age				
< 80 years	75	54	37.36 (1.07)	.82
80–84 years	90	66	36.69 (0.88)	
85–89 years	86	63	38.06 (1.02)	
≥ 90 years	76	59	37.00 (0.83)	
Gender				
Male	67	52	37.45 (0.84)	.74
Female	268	133	37.22 (0.64)	
Race				
White	263	113	37.03 (0.67)	.53
Non-White	30	23	39.00 (1.69)	
ADL function (no. dependent)				
0–2	95	48	40.95 (0.94)	< .0001
3–5	92	59	38.04 (0.96)	
6–7	99	73	32.79 (0.79)	
Cognitive impairment^c				
Mild	43	33	42.67 (1.14)	< .0001
Moderate	83	57	39.40 (0.85)	
Severe	86	65	37.21 (0.83)	
Very severe	115	79	34.02 (0.85)	
Cornell Depression Scale^d				
< 7	214	99	37.64 (0.68)	.008
≥ 7	63	47	35.08 (1.11)	
Behavioral symptoms of dementia				
None	118	64	38.07 (0.78)	.019
At least weekly	159	91	36.30 (0.75)	
PGC-PIS^e				
< 2	210	95	36.49 (0.66)	.080
≥ 2	55	37	38.78 (1.30)	

Notes: QOL-AD = quality of life–Alzheimer’s disease; ADL = activity of daily living; PGC-PIS = Philadelphia Geriatric Center–Pain Intensity Scale. For residents, *N* = 335; for care providers, *N* = 143. An individual nursing assistant may provide a QOL-AD score for a resident in more than one row. *N*s vary across measures because of missing data.

^aAdjusted for clustering of residents within nursing assistants and nursing assistants within facility using Taylor series expansion models.

^bBased on linear mixed models including random effects for facility and nursing assistants nested within facilities and the single fixed effect as shown.

^cAssessment of cognitive impairment is based on Mini-Mental State Examination (MMSE) or Minimum Data Set–Cognition (MDS-COGS) scores. Cutpoints for mild, moderate, severe, and very severe, are ≥ 17, 10–16, 3–9, 0–2, respectively (MMSE); 0–1, 2–4, 5–6, and 7–10, respectively (MDS-COGS).

^dA Cornell Depression Scale cutpoint of 7 suggested for minor depressive disorder (Alexopoulos et al., 1988).

^eIn this sample, a cutpoint of 2 corresponded to an average across the 6 items in the PGC-PIS instrument of “a little” pain or worse.

a set of characteristics is included in the model, we can conclude that such variations are in part the result of these characteristics.

We included individual variables that were associated with QOL-AD scores in the unadjusted analysis at *p* ≤ .05, with one exception. Although both frequency of residents’ behavioral symptoms of dementia and number of depressive symptoms were significantly associated with nursing assistants’

QOL-AD ratings, these two variables were also strongly correlated (*r* = .56, *p* < .001). We included only frequency of behavioral symptoms in the final model because agitation and other behaviors are more likely to affect nursing assistant ratings of residents with dementia than less easily detected depressive symptoms. Despite not having significant associations with QOL-AD in the unadjusted analysis, we also included the measures related to nursing assistant age, training, approaches to dementia, and staff experience working with demented residents because of hypothesized clinical relevance.

Results

Table 1 presents resident demographic and clinical characteristics by their QOL-AD scores as rated by nursing assistants. A total of 143 nursing assistants rated 335 residents’ quality of life. On average, each nursing assistant rated the quality of life of 2.3 residents (range 1–9). There was no association between nursing assistants’ QOL-AD ratings and resident age, gender, or race. There was a statistically significant inverse relationship (*p* < .001) between QOL-AD scores and both resident functional and cognitive impairments. In addition, depression was associated with a lower QOL-AD rating (*p* = .008), as was the presence of at least one behavioral symptom per week (*p* = .019). Residents with pain scored marginally higher on the QOL-AD (*p* = .08).

Table 2 shows the crude and adjusted relationships between selected nursing assistant and facility characteristics and nursing assistants’ QOL-AD ratings. In both the crude and adjusted analyses, there were no associations between nursing assistants’ age, gender, or race and their QOL-AD ratings. There also were no statistically significant differences in QOL-AD scores based on certification status of nursing assistants and which shift they most commonly worked. (Comparisons may be limited by the small number of men and noncertified nursing assistants in this sample, however.) In the unadjusted analysis, residents received higher QOL-AD ratings from nursing assistants who had been in their current position for less than 1 year compared with those who had been in their position for more than 1 year. Residents in RC/AL facilities and for-profit facilities also received higher QOL-AD ratings from their nursing assistants than those in nursing homes and not-for-profit facilities. However, these differences did not persist after we adjusted for residents’ clinical characteristics.

Table 3 presents the correlations between QOL-AD scores of nursing assistants and their responses on several instruments that measure their training, attitudes, and beliefs regarding individuals with dementia, and their work experiences. There were statistically significant positive correlations between

Table 2. Mean Nursing Assistant Quality of Life-Alzheimer's Disease Score by Selected Nursing Assistant and Facility Characteristics

Characteristic	No. of Residents	No. of Nursing Assistants	Mean QOL-AD Score (SE) ^a	<i>p</i>	
				Unadjusted ^b	Adjusted ^{b,c}
Nursing assistant					
Age					
< 40 years	136	61	35.76 (0.82)	.23	.77
≥ 40 years	125	47	38.33 (0.93)		
Gender					
Male	9	6	39.22 (4.27)	.09	.31
Female	256	105	36.89 (0.66)		
Race					
Black	121	53	36.38 (0.94)	.95	.90
White	126	48	37.53 (0.93)		
Other	18	10	36.94 (2.36)		
Certified as CNA					
No	6	3	40.50 (3.54)	.37	.24
Yes	259	108	36.88 (0.65)		
Most common work shift					
Day	216	91	36.60 (0.71)	.16	.16
Other	48	19	38.63 (1.69)		
Time in current position					
< 1 year	60	25	38.97 (1.60)	.02	.15
≥ 1 year	203	84	36.32 (0.69)		
Facility					
Facility type					
RC/AL	169	59	38.30 (0.75)	.02	.80
Nursing home	96	52	34.63 (1.04)		
Profit status					
Not for profit	85	39	34.62 (1.07)	.02	.14
For profit	180	72	38.07 (0.76)		

Notes: QOL-AD = quality of life-Alzheimer's disease; RC/AL = residential care/assisted living; CNA = certified nursing assistant. For residents, *N* = 265; for care providers, *N* = 111. *N*s vary across measures because of missing data.

^aAdjusted for clustering of residents within nursing assistants and nursing assistants within facility using Taylor series expansion methods.

^bBased on linear mixed models including random effects for facility and nursing assistants nested within facilities, and either the single fixed effect shown (unadjusted analyses) or the fixed effect shown plus the covariates noted (adjusted analyses).

^cAdjusted for residents' cognitive impairment, number of ADL disabilities, depressive symptoms, pain severity, and frequency of behavioral symptoms.

beliefs by nursing assistants that they were well trained and their QOL-AD ratings for residents ($p = .03$). In addition, there were positive albeit modest correlations between nursing assistants' attitudes about dementia, as measured by the Approaches to Dementia instrument, and their QOL-AD ratings after multivariate adjustment ($p = .09$). Although there was no association between the Approaches to Dementia Hope subscale and QOL-AD scores, we did observe a positive correlation between the Person-Centered subscale and QOL-AD scores ($p = .006$).

In unadjusted analyses, nursing assistants who reported more work stress provided statistically significantly lower QOL-AD scores than nursing assistants who reported less stress ($p = .04$). Two of the Work Stress Inventory's subscales also were significantly negatively correlated with QOL-AD scores: the Caring for Residents subscale, which assesses whether nursing assistants believed that they were appreciated by residents and families, and the Physical Design subscale, which evaluates nursing

assistants' satisfaction with the facility's physical environment. However, none of these correlations remained statistically significant after we adjusted for resident characteristics. Similarly, we found no statistically significant correlations between nursing assistants' experience and satisfaction working with demented residents and their QOL-AD ratings in either the unadjusted or adjusted analyses.

Table 4 shows the results of the hierarchical linear modeling to predict QOL-AD scores. The first model (no fixed effects) divides the total variability in QOL-AD scores ($64.52 = 48.87 + 9.36 + 6.29$) into between-resident, between-nursing assistant, and between-facility components prior to the inclusion of any fixed effects (independent variables). In this model, 76% ($48.87/64.52$) of the overall variability in QOL-AD scores is due to differences among residents, 14% ($9.36/64.52$) results from differences among nursing assistants, and 10% ($6.29/64.52$) is from differences among facilities. Thus, a large amount of variation in QOL-AD

Table 3. Correlations of Nursing Assistant Quality of Life–Alzheimer’s Disease Score With Nursing Assistant Training, Approaches, Stress, and Experiences

Variable	Unadjusted		Adjusted ^a	
	Correlation	<i>p</i>	Correlation	<i>p</i>
Training, total (theoretical range 0–42)	.108	.07	.137	.03
Assessment (0–21)	.034	.26	.091	.08
Treatment (0–21)	.156	.03	.151	.03
Approaches to dementia, total (19–95)	.043	.33	.100	.09
Hope (8–40)	–.025	.92	–.017	.90
Person-centered care (11–55)	.100	.12	.188	.006
Work stress, total (6–30)	–.169	.04	–.053	.34
Caring for residents (1–5)	–.172	.02	–.117	.05
Relationships with coworkers (1–5)	–.135	.14	.022	.96
Relationships with supervisors (1–5)	–.081	.44	.017	.78
Work load and scheduling (1–5)	–.111	.10	–.037	.20
Physical design (1–5)	–.200	.02	–.120	.14
Work events (1–5)	–.065	.69	–.011	.97
Staff experience working with demented residents, total (0–84)	.130	.18	.100	.26
Experience feedback (0–24)	.114	.30	.057	.67
Care organization (0–12)	.167	.09	.101	.32
Satisfaction of own expectations (0–12)	.110	.17	.077	.25
Satisfaction with patient contact (0–12)	.103	.15	.085	.22
Satisfaction with others’ expectations (0–12)	.000	.93	.067	.37
Satisfaction with work environment (0–12)	.091	.47	.087	.41

Notes: *N* ranges from 249 to 253 among the nursing assistant measures because of missing data; however, for each measure, the sample size is the same in the unadjusted and adjusted analyses. *p* values are based on linear mixed models including random effects for facility and nursing assistants nested within facilities, and either the single fixed effect shown (unadjusted analyses) or the fixed effect shown plus the covariates noted (adjusted analyses).

^aAdjusted for residents’ cognitive impairment, number of ADL disabilities, depressive symptoms, pain severity, and frequency of behavioral symptoms.

scores occurs at the resident level ($p < .001$), and small amounts of variation occur among nursing assistants ($p = .07$) and among facilities ($p = .07$).

Adding resident measures to the model decreased residual variability among QOL-AD scores; 31% [$1 - (33.65/48.87) \times 100\%$] of the variability in QOL-AD scores attributable to between-resident differences was explained by the resident-level characteristics used in this model. The model with resident factors reveals that higher cognitive impairment, more ADL disabilities, and more

frequent behavioral manifestations of dementia are significantly related to lower QOL-AD scores. For example, having one additional ADL impairment results in QOL-AD scores that are on average 1.13 points lower. Residents with very severe cognitive impairment had a QOL-AD score that on average was 5.63 points lower than that of residents with mild cognitive impairment. For each behavioral symptom observed, QOL-AD scores decreased by 0.45 points. Although the initial between-facility variance was small, more than one half of this variance was explained by resident characteristics.

The next model assessed nursing assistant characteristics adjusted for the resident characteristics in the model. The nursing assistant factors were age of the nursing assistants and their summary scores on the Training, Work Stress Inventory, Approaches to Dementia, and Staff Experience Working With Demented Residents instruments. The nursing assistant variance slightly decreased in comparison with the initial model. Only 3% [$1 - (12.71/13.16) \times 100\%$] of the variance was explained by the nursing assistant characteristics in the model. None of the nursing assistant characteristics included in the model were statistically significant. The facility variance increased slightly after we added nursing assistant variables from the model that adjusted only for resident characteristics. The estimates of the magnitude of the resident characteristics and the resident-level variance change little when we add nursing assistant and facility characteristics to the model.

The final model evaluated facility factors after adjustment for resident and nursing assistant characteristics. The nursing assistant variance increased slightly from the model that did not adjust for facility factors. The facility variance decreased slightly; 25% [$1 - (2.78/3.70) \times 100\%$] of the facility-level variance was explained by the facility factors in the model. With respect to the initial model that had no fixed effects, 56% [$1 - (2.78/6.28) \times 100\%$] of the variability in QOL-AD scores attributable to between-facility characteristics was explained, whereas virtually none of the between-nursing assistant QOL-AD score variability was explained by the measures included in the analysis. In this final model, only resident characteristics had a significant effect in explaining QOL-AD score variation; neither nursing assistant nor facility characteristics were statistically significant.

Discussion

This study increases understanding of how nursing assistants in long-term care perceive the quality of life of residents with dementia. What is most important is that the results demonstrate that nursing assistants’ QOL-AD ratings are related to their own attitudes toward residents with dementia and by their own perceived competence to address residents’ funda-

Table 4. Predictors of Nursing Assistant Estimates of Resident Quality of Life: Parameter Estimates From Hierarchical Linear Model for Nursing Assistant Quality of Life–Alzheimer’s Disease Score

Measure	Model and Parameter Estimate (SE) ^a			
	No Fixed Effects	Plus Resident	Plus Resident and Nursing Assistant	Plus Resident, Nursing Assistant, and Facility
Intercept ^b		46.00 (1.30)***	38.46 (7.82)***	36.77 (7.87)***
Resident characteristics				
Cognitive impairment				
Mild (reference)		—	—	—
Moderate		−3.16 (1.40)*	−3.24 (1.41)*	−3.23 (1.41)*
Severe		−4.15 (1.46)**	−4.27 (1.46)**	−4.15 (1.46)**
Very severe		−5.63 (1.54)***	−5.72 (1.55)***	−5.59 (1.55)***
No. of ADL disabilities		−1.13 (0.21)***	−1.18 (0.21)***	−1.23 (0.22)***
No. of behavioral symptoms		−0.45 (0.19)*	−0.44 (0.20)*	−0.48 (0.20)*
Nursing assistant characteristics				
Age (years)			−0.02 (0.05)	0.01 (0.05)
Training score			0.19 (0.10) [†]	0.17 (0.10) [†]
Approaches to dementia ^c			0.10 (0.09)	0.09 (0.09)
Work stress ^d			−1.07 (1.09)	−1.48 (1.11)
Experience and satisfaction ^e			−0.04 (0.07)	−0.04 (0.07)
Facility characteristics				
Nursing home (vs RC/AL)				3.09 (1.76) [†]
For profit				3.05 (1.72) [†]
Variance components				
Resident	48.87 (5.51)***	33.65 (4.05)***	33.55 (4.04)***	33.31 (3.98)***
Nursing assistant	9.36 (6.06) [†]	13.16 (5.68)**	12.71 (6.00)*	13.20 (5.94)*
Facility	6.29 (4.27) [†]	2.33 (2.98)	3.70 (3.73)	2.78 (3.67)

Notes: ADL = activity of daily living; RC/AL = residential care–assisted living. For the table, $n = 252$.

^aThe parameter estimates reflect the incremental change in quality-of-life rating for each one-unit increase in the resident, nursing assistant, or facility characteristic of interest, adjusting for the other characteristics, or, for categorical measures, the change in quality-of-life rating for the given level compared to the reference group. For example, in the full model, quality-of-life rating decreases an average of 1.23 points for each additional ADL disability, while those with very severe cognitive impairment receive quality-of-life ratings an average of 5.59 points lower than those with mild impairment.

^bThe intercept is the overall mean quality-of-life rating, adjusted for the fixed covariates in a given model.

^cApproaches to dementia: summary score range = 19–95.

^dWork stress inventory: total score = average of 45 items, with each item scored 1–5.

^eStaff experience working with demented residents: summary score range 0–84.

* $p < .05$; ** $p \leq .01$; *** $p < .001$; [†] $p < .10$.

mental care needs. To our knowledge, this study is the first to examine and demonstrate associations between resident quality-of-life ratings and attitudes of nursing assistants regarding their training and person-centered care.

Providing person-centered care has been emphasized as important to the quality of care and life of residents with dementia (Kitwood, 1997). In this practice model, care providers form relationships with residents with dementia and they seek to understand and address their individual needs despite their functional and cognitive deficits (Touhy, 2004). The goals of person-centered care and quality-of-life perception are complementary, as each focuses on resident individuality and attempts to avoid generalizations about residents—generalizations that are often negative in nature.

The positive association between attitudes of nursing assistants regarding person-centered care and their resident QOL-AD scores may indicate that care providers who perceive residents with dementia as having the capacity to engage in relationships and

activities also will consider that their lives have quality. These care providers may be more likely to provide person-centered care, although this study did not examine care providers’ actual treatment of residents. Alternatively, it is possible that those care providers who value the quality of life of residents with dementia will perceive them as individuals. Therefore, the directionality of this relationship is unclear.

In addition, nursing assistants with greater confidence in their training to assess and treat residents’ personal care needs had higher resident QOL-AD ratings. Because training confidence may serve as a proxy for perceptions by care providers of their care quality, nursing assistants may believe that resident quality of life depends on the quality of their care. Further, it is possible that training regarding person-centered care principles will result in improved quality-of-life ratings. Person-centered care training would seek to minimize biases held by nursing assistants about dementia that affect their perceptions of resident quality of life. Thus, training

to address and treat care needs such as ADLs should monitor not only the competence of care providers but also their confidence. Once again, because directionality is uncertain, it should be considered that nursing assistants who value resident quality of life feel less overwhelmed by, and better able to address, resident quality-of-life needs. Either way, valuing quality of life appears likely to be beneficial to care provision, although the relationship between quality-of-life perceptions and care quality merits further study.

Although the attitudes of nursing assistants were related to their QOL-AD scores, resident clinical status was the most significant predictor of care provider QOL-AD ratings. As resident functional and cognitive impairments increased, QOL-AD scores progressively decreased. In bivariate analyses, the two characteristics associated with the lowest mean QOL-AD scores were dependence in six to seven ADLs and very severe cognitive impairment. In addition, residents with depression and behavioral symptoms received lower QOL-AD ratings from their care providers.

Prior studies of community-based residents with chronic illness and dementia have demonstrated that functional status and depression are strongly associated with both resident and family caregiver quality-of-life ratings (Logsdon et al., 2002; Patrick, Kinne, Engelberg, & Pearlman, 2000). In one of these studies, cognitive impairment severity was not correlated with QOL-AD scores among community-dwelling individuals (Logsdon et al.). Thus, as measured by the QOL-AD, it is possible that dementia may have a greater perceived impact on quality-of-life ratings in long-term care. That is, nursing assistants may be comparing multiple residents in their care when rating any single resident's quality of life. A family member's rating for a loved one is based on a long-term relationship with that individual, and therefore it may be attenuated by the slow trajectory of decline witnessed over time.

It is also important to note that QOL-AD scores from long-term care staff in this study were unbiased by residents' or nursing assistants' demographic characteristics, including age, gender, or race. However, the racial diversity among the residents was limited (8% were African American), which generally reflects the distribution of residents in RC/AL and nursing homes (Howard et al., 2002). Thus, the relationship of quality of life to residents' race is one that has yet to be sufficiently examined. Nonetheless, the results of this study suggest that nursing assistants focus on residents' clinical characteristics when they are assessing quality of life.

It should be recognized that a low quality-of-life rating may be appropriate and consistent with residents' own values. Low scores can provide an opportunity to reassess residents' care plans and ensure that their treatment decisions are consistent with resident preferences, are focused on areas important

to quality of life, and are not unduly burdensome. In addition, decreases in quality-of-life perceptions may prompt a discussion of palliative care approaches with residents' families, and thus serve as an indicator of care needs, rather than as an outcome of care, as is often the case.

Although this study demonstrates significant associations between QOL-AD scores and both resident and care provider characteristics, another important finding is that a substantial portion of the QOL-AD score variability among residents with dementia was not explained by the characteristics included in the hierarchical linear model. Although most of the variability [$48.87/64.5 \times 100\% = 76\%$; see Table 4] in care provider QOL-AD scores results from differences among residents, only 30% of the variance was explained by covariates in the model. The unexplained QOL-AD variability may result, in part, from one or more unmeasured covariates, or measurement error for the covariates included in this study. Given the importance of understanding the factors associated with nursing assistant quality-of-life observations, future research should further examine the factors associated with variability in QOL-AD ratings. Researchers may identify unmeasured covariates in future studies by including measures of resident behavior other than behavioral symptoms, such as the degree of residents' physical contact and engagement (Bradford Dementia Group, 1997; Sloane et al., 1998). Refining the instruments used to assess care provider attitudes and training confidence may be another approach to reducing the variability in QOL-AD scores.

Research efforts to define and measure quality of life in residents with dementia remain in their early stages (Whitehouse, Patterson, & Sami, 2003). To our knowledge, this study is the first to assess how care providers rate the quality of life of long-term care residents with dementia. In this study we found that, although approximately one fourth of the variability of QOL-AD scores was attributed to variations among care providers or variations among facilities, the overall care provider and facility variation was mostly unexplained by the care provider and facility characteristics examined. In addition to identifying further care provider and resident factors associated with quality-of-life ratings, future studies may examine whether improving care provider person-centered attitudes and training results in improved resident quality-of-life ratings. Given that optimal quality of care is a fundamental goal for residents with dementia, the association between nursing assistant quality-of-life ratings and care quality also should be evaluated.

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