

# Dementia Care and Quality of Life in Assisted Living and Nursing Homes

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**Purpose:** There are few empirical studies relating components of long-term care to quality of life for residents with dementia. This study relates elements of dementia care in residential care/assisted living (RC/AL) facilities and nursing homes to resident quality of life and considers the guidance this information provides for practice and policy. **Design and Methods:** We used a variety of report and observational measures of the structure and process of care and 11 standardized measures of quality of life to evaluate the care for and quality of life of 421 residents with dementia in 35 RC/AL facilities and 10 nursing homes in four states. Data were collected cross sectionally on-site, and we conducted a 6-month follow-up by telephone. **Results:** Change in quality of life was better in facilities that used a specialized worker approach, trained more staff in more domains central to dementia care, and encouraged activity

participation. Residents perceived their quality of life as better when staff was more involved in care planning and when staff attitudes were more favorable. Better resident-staff communication was related to higher quality of life as observed and reported by care providers. Also, more stable resident-staff assignment was related to care providers' lower quality-of-life ratings. **Implications:** Improvement in resident quality of life may be achieved by improved training and deployment of staff.

*Key Words:* Long-term care, Residential care, Staff practices, Training, Observation

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Between 23% and 42% of residents in residential care/assisted living (RC/AL) settings have moderate or severe cognitive impairment, as do more than one half of nursing home residents (Zimmerman et al., 2003). While attention has been focused on the quality of long-term care for decades, remarkably little has focused on how care in both of these settings relates to quality of life for persons with dementia—in part because dementia-focused quality-of-life measures are comparatively new, and in part because RC/AL as a site of long-term care has only recently come under study (Ready & Ott, 2003; Wunderlich & Kohler, 2001). Such information is critically needed to guide policy and the development of best practices.

This article focuses on care and quality-of-life issues that have practice and policy relevance. It characterizes the current state of dementia care in RC/AL and nursing homes (based on report and observation); describes the characteristics and quality of life of residents with dementia in RC/AL and nursing homes (examining quality of life both cross sectionally and longitudinally, using multiple quality-of-life measures from the perspectives of residents and staff, and from observation); determines how dementia care (including special care units for residents with dementia) relates to resident quality

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of life; and considers the guidance this information provides for practice and policy.

## Design and Methods

### *Sample and Recruitment*

The Dementia Care project recruited individuals with a diagnosis of dementia living in a diverse set of facilities in four states that have different yet well-developed RC/AL industries (Florida, Maryland, New Jersey, and North Carolina). RC/AL included those facilities licensed by states at a nonnursing home level of care that provide room and board; assistance with activities of daily living (ADLs), personal care, and medication administration; and 24-hour oversight. Using the typology developed for the Collaborative Studies of Long-Term Care (CS-LTC), the study stratified RC/AL facilities to include: (a) facilities with < 16 beds; (b) facilities with  $\geq$  16 beds of the “new-model” type (those proliferating under the recent surge of assisted living that provide nursing care and cater to an impaired population); and (c) “traditional” facilities with  $\geq$  16 beds, not meeting new-model criteria. Details of the CS-LTC and the facility typology can be found elsewhere (Zimmerman et al., 2001).

The Dementia Care project enrolled a purposive sample of 45 facilities. For efficiency, facilities with fewer than 2 eligible residents (in smaller facilities) or 13 eligible residents (in other facilities) were excluded from study. Facilities were enrolled in a manner that maintained stratification across states and by facility type and that maximized the number of residents from smaller facilities. Twenty-two facilities (33%) declined to participate. These facilities did not differ from participating facilities in reference to type, size, or state. The final sample included 14 (31%) RC/AL facilities with < 16 beds; 11 (24%) traditional facilities; 10 (22%) new-model facilities; and 10 (22%) nursing homes. Twelve facilities were from North Carolina, and all other study states had 11 facilities. Given the purposive nature of facility selection, the descriptive data presented in this study are best used to formulate hypotheses.

Residents were randomly selected in each facility from among those aged 65 years or older who had a diagnosis of dementia. They were ineligible if they had a primary diagnosis of Huntington’s disease, alcohol-related dementia, schizophrenia, manic-depressive disorder, or mental retardation. To provide similar representation across facility types, a maximum of 4 residents per smaller facility and 19 per larger facility were enrolled. A total of 575 eligible residents or their families were approached for consent. Of these, 421 (73%) agreed to participate, 66 (11%) declined, and 88 (15%) were unable to provide consent and had family who were unreachable. Additional information about the design is

provided in the introduction to this issue (Zimmerman, Sloane, Heck, Maslow, & Schulz, 2005).

### *Data Collection*

Data collection was conducted between September 2001 and February 2003. Data collectors observed the physical environment of all facilities and characteristics of a random sample of participating residents in each facility (79%) and conducted interviews with each resident participant (95% response rate), his or her most involved family member (84% response rate), the direct care provider who knew the resident best (98% response rate), the supervisor (position above a direct care provider) who knew the most about the resident (89% response rate), and the facility administrator (to obtain facility-level data; 100% response rate). In 4% of cases—usually in smaller facilities—the direct care provider and supervisor were the same individual. Ninety-four percent of direct care providers were nurse or personal care aides, and 78% of supervisors were registered nurses (RNs) or licensed practical nurses (LPNs).

### *Measures*

Data were collected to assess care provision (facility-level and resident-level) and resident quality of life.

*Facility-Level Care Provision.*—Dementia care measured at the facility level applied to all participants within a facility (or unit, if the facility included both an area designated for dementia care and an area not so designated). Administrators provided information about facility demographics (facility type, age, profit status, affiliation with another level of care or a chain of facilities, number of beds, presence of dementia-specific unit) and case-mix related to dementia diagnosis and each of six ADL impairments (eating, dressing, walking, transferring, bathing, and continence). The administrator also reported on several aspects of staffing, including the stability of care provider–resident assignments, whether the facility provided care based on a universal worker perspective (where staff fill multiple roles) and/or a specialized worker perspective (where staff have specialized roles), the number of nurses and nursing or personal care aides (overall and contract), staff turnover (at the administrator, nursing, and aide level), and the extent to which the facility sought to hire workers with experience in dementia care. Four measures of facility policies and practices were obtained, based on the Policy and Program Information Form (POLIF; Moos & Lemke, 1996): policy choice (7 items), leniency of admissions (24) and discharge policies (24), and acceptance of problem behavior (16). The latter three measures

were assessed separately for dementia-specific and non-dementia-specific areas when applicable, and all were scored from 0 to 100, reflecting the percentage of items endorsed. Involvement in formal care planning of professional staff (averaged across administrator, physician, nurse, activity specialist, social service worker, mental health specialist, clergy, and dietician) and aides was scored from never to weekly.

Facility-level items regarding formal staff training, resident assessment, and treatment practices were ascertained for each of the following six domains of care: depression, pain, behavioral symptoms, ambulation, nutrition, and hydration. (The brief reports included in this issue further detail these measures.) Reports of the proportion of supervisory and direct care staff who received formal training in each domain within the past year were categorized as 0 (none), 1 (some; 1–74%), or 2 (most;  $\geq 75\%$ ); scores were then summed across the six domains to yield a 0 through 12 summary score. Similarly, an assessment variable was created, consisting of the sum of domains for which the facility used professional assessment (e.g., mental health professionals for depression) and written, standardized assessment. A professional treatment variable was created as the average across the six areas of the percent of residents receiving ongoing, professional treatment for impairment in that area; “other/informal treatment” was created to be the number of areas for which the facility used other treatments; and perceived treatment success was the number of areas in which the administrator felt the facility did “quite a bit” or “extremely well” treating their residents. Except for perceived success, assessment and treatment were obtained separately for dementia-specific and non-dementia-specific areas. Three additional measures of treatment included the proportion of study participants who had received an antipsychotic or sedative hypnotic medication at least 4 out of the last 7 days (reported by the supervisor), the extent to which the facility provided and encouraged activity participation in 10 domains, separately by care area (e.g., exercise, personal care, social, meal preparation, work-oriented; Zgola, 1987), and the use of stimuli in seven areas (e.g., craft or household items).

Finally, data collectors systematically observed the environment, using the Therapeutic Environment Screening Survey for RC/AL (TESS-RC/AL), a measure derived from the Therapeutic Environment Screening Survey for Nursing Homes (TESS-NH; Sloane et al., 2002). Observations were used to compute two scales (separately for dementia-specific and non-dementia-specific areas): the Special Care Unit–Environmental Quality Score (SCU-EQS), which ranges from 0 to 38 and assesses 18 components relevant for individuals with dementia (e.g., orientation and memory cues); and the Assisted Living–Environmental Quality Score (AL-EQS), which

ranges from 0 to 30 and assesses 15 components (some of which are in the SCU-EQS) more characteristic of assisted living environments (e.g., resident autonomy and homelikeness).

*Resident-Level Care Provision.*—Dementia care measured at the resident level referred specifically to the study participants or their staff care providers, using data from interviews with staff and family members, and direct observation. The supervisor reported whether the resident had received cholinesterase inhibitors at least 4 of the past 7 days. Direct care providers reported their approaches to dementia care, their work satisfaction, and their work stress. The Approaches to Dementia measure was used to assess staff attitudes; it contains 19 items, summed to form a total score as well as person-centered and hope subscores (Lintern, Woods, & Phair, 2000b). The Work Stress Inventory was used to assess the frequency of 45 staff stressors related to work events, resident care, relationships with coworkers and supervisors, workload and scheduling, and physical design (Schaefer & Moos, 1993). Work satisfaction was measured using the 21-item Staff Experience Working with Demented Residents measure, which assesses satisfaction of one’s own expectations, coworkers and supervisors, work environment, and resident care (Åström, Nilsson, Norberg, Sandman, & Winblad, 1991). These measures are described in detail elsewhere in this issue (Zimmerman, Williams, et al., 2005). In addition, family members reported the amount of time they spent each week visiting or talking on the phone with the resident.

Direct observations of study residents were conducted at 5-min intervals during three 1-hr observation periods (chosen to exclude mealtimes), from which four measures of resident care were derived. Communication was measured as the percent of observations during which the resident received any verbal communication from a staff member, physical contact was the percent of observations during which the resident had any physical contact with another person, and personal detractors and positive person work were similarly measured as the percent of observations in which any personal detractors (staff behaviors that demean or depersonalize) or positive person work (positive interactions between staff and resident) were noted (Bradford Dementia Group, 1997). Whether the resident was ever observed in restraints (full or partial bedrails, trunk, wrist, ankle, or chair restraints) also was noted, and during the first observation each hour, residents were assessed to determine if they appeared ungroomed, unkempt, or unclean and whether appearance was ever inappropriate with respect to time of day, season, or place.

*Resident Characteristics.*—The supervisor provided information on several resident characteristics, including demographics (age, gender, race, marital status) and length of stay. The presence of behavioral

symptoms of dementia during the past 2 weeks was measured using the Cohen-Mansfield Agitation Inventory (CMAI; Cohen-Mansfield, 1986), functional status was measured as the number of activities in which the resident needed supervision or assistance using the seven items from the Minimum Data Set Activities of Daily Living (MDS-ADL) scale (Morris, Fries, & Morris, 1999), residents were classified as being depressed if they scored  $\geq 7$  on the Cornell Scale for Depression in Dementia (CSDD; Alexopoulos, Abrams, Young, & Shamoian, 1988), and comorbidity was the number of chronic conditions (out of 11) reported by the supervisor. Finally, cognitive deficit was categorized based on the Mini-Mental State Exam (MMSE; Folstein, Folstein, & McHugh, 1975) score administered to the resident, or (if the MMSE was not available) the Minimum Data Set-Cognition Scale (MDS-COGS; Hartmaier, Sloane, Guess, & Koch, 1994) reported by the supervisor. Cognition was scored as follows: mild (MMSE 17–30 or MDS-COGS 0–1), moderate (MMSE 10–16 or MDS-COGS 2–4), severe (MMSE 3–9 or MDS-COGS 5–6), or very severe (MMSE 0–2 or MDS-COGS 7–10).

**Quality of Life.**—Quality of life was assessed by the resident (three measures), direct care provider (six measures, one of which was longitudinal), and through observation (three measures); measures are described in detail elsewhere (Sloane et al., 2005, this issue). Unless otherwise noted, higher scores indicate better quality of life. Residents with a MMSE of 10 or greater completed the Dementia Quality of Life (DQOL; Brod, Stewart, Sands, & Walton, 1999), the Quality of Life in Alzheimer's Disease Activity measure (QOL in AD-Activity; Albert et al., 1996), and the Quality of Life-Alzheimer's Disease (QOL-AD; Logsdon, Gibbons, McCurry, & Teri, 2000), as modified by Edelman, Fulton, Kuhn, and Change (2005, this issue) for use in long-term care settings.

Care providers completed proxy versions of the QOL in AD-Activity, and the QOL-AD, as well as the positive and negative affect portions of the QOL in AD (higher negative affect scores indicate poorer quality of life), and the Alzheimer Disease Related Quality of Life (ADRQL; Rabins, Kasper, Kleinman, Black, & Patrick, 2000). Additionally, the proxy version of the QOL-AD was readministered 6 months after initial data collection. We computed raw change as the difference between baseline and 6 months, with positive scores indicating improvement in quality of life; to account for regression to the mean, we estimated adjusted change as the residual from regression of raw change on the baseline value, which therefore has a sample mean of exactly zero (Cronbach & Furby, 1970). Because change is influenced by baseline status, we based all statistical comparisons on adjusted values.

Using the observational procedures described above, we recorded behaviors in accordance with

the Dementia Care Mapping (DCM) protocol (Bradford Dementia Group, 1997) and a modification of the Philadelphia Geriatric Center Affect Rating Scale (PGC-ARS; Lawton, Van Haitsma, & Klapper, 1996). DCM-derived measures included the percent of observations with a Type I Behavior Category Code (DCM % BCC Type I), considered to be “good” behaviors such as conversation or creative expression, and the mean Well- and Ill-Being (WIB) score, with anchors of +5 and –5, indicating the state of well-being. (See Brooker, 2005, and Sloane et al., 2005, this issue, for a more in-depth discussion). The PGC-ARS was coded to record the predominant emotion at each observation (scored from 0 for anxiety, fear, or sadness, to 3 for high pleasure) and summarized at the resident level as the percent of the highest possible score.

## Analyses

We used simple descriptive methods (means and standard deviations for continuous measures, percentages for categorical measures) to describe the components of dementia care. For measures assessed separately in dementia-specific and non-dementia-specific care areas, comparisons used generalized estimating equations (GEE: Diggle, Heagerty, Liang, & Zeger, 2002) applied to linear (continuous) or logistic (dichotomous) models, specifying an exchangeable correlation matrix to account for resident clustering within facility.

We estimated means and standard errors of the quality-of-life measures according to facility type and resident characteristics, dichotomized at the sample median or at commonly accepted cutpoints; we adjusted the standard errors for clustering using Taylor series expansion methods (Woodruff, 1971). We tested the statistical significance of these associations using linear mixed models with random effects specified as follows: for care provider reported quality-of-life measures, models included random effects for facility and care provider (nested within facility); for resident-reported measures, models include a random effect for facility; and for directly observed measures, models include random effects for facility and observer.

We estimated the association between care and quality of life using partial Pearson correlation coefficients, adjusting for facility type; resident age, gender, race, marital status, length of stay; and cognitive, ADL, number of comorbid conditions, depressive, and behavioral symptoms. To maximize the sample size for resident-reported quality-of-life analyses in the presence of covariate missingness, we did not adjust associations for age, race, marital status, or length of stay (none of which was significantly related to quality of life). We tested the statistical significance of these associations using linear mixed models, controlling for these

resident characteristics and with random effects as specified above.

## Results

The mean values shown in Table 1 indicate that, on average, almost one third of beds were dementia specific, and slightly more than one half of the facility residents were reported to have dementia or at least one ADL impairment. In the average facility, staff tended to be reassigned to new residents monthly or less frequently, and 58% and 38% of facilities used a universal worker and specialized worker philosophy, respectively. Approximately 11% of nursing care and 2% of personal care was provided by contract workers, with 46% of nurses turning over annually. Care planning practices included the involvement of professional staff and aides 1 to 3 times a month. On average, less than 75% of staff were trained in the six care areas (the figure corresponding to a score of 8), but facilities provided professional assessment in more than five of the areas and written or standardized assessment in approximately three. Almost one third of residents were reported to have received professional care in the six care areas, with the administrator perceiving success in five areas. In the average facility, nearly one half (48%) of study residents were taking antipsychotic or sedative hypnotic drugs.

Variables for which two figures are provided refer to dementia specific versus non-dementia-specific care areas. While the environmental AL-EQS was scored statistically significantly higher in non-dementia-specific areas (13.4 vs 11.9), dementia-specific areas were more accepting of problem behaviors (23% vs 13%) and encouraged activities slightly more frequently (score 2.4 vs 2.2; all  $p < .05$ ).

Table 2 separates care by dementia-specific area for all resident-level variables. It shows that supervisors (of the residents enrolled in this study) who worked in non-dementia-specific areas had slightly more experience but that positive person work and physical contact were witnessed more often in dementia-specific areas (22% vs 17%, and 9% vs 6% of observations, respectively). Overall, 13% and 20% of resident participants were in restraints and ungroomed during at least one observation, and 29% were taking a cholinesterase inhibitor. On average, families spent almost 7 hr per week visiting or talking with the resident.

As rated by care providers and observation (in unadjusted analyses), quality of life was related to facility type (see Table 3). Care providers in RC/AL rated quality of life higher than those in nursing homes using three different measures (ADRQL, QOL in AD–positive affect, QOL-AD); two measures did not differentiate facility type (QOL in AD–activity, QOL in AD–negative affect), nor did change in quality of life. The remainder of Table 3 provides

the distributions of quality of life by resident characteristics. Change in quality of life (9th and 10th QOL columns) was related only to level of cognitive impairment (more impaired residents had greater reductions in QOL-AD compared to less impaired residents; raw change of  $-2.6$  vs  $-2.1$ ,  $p < .01$ ) and depression (depressed individuals had greater reductions in QOL-AD compared to the nondepressed; change of  $-2.7$  vs  $-2.2$ ,  $p < .05$ ). Cross sectionally, based on resident report, only fewer comorbidities were related to better quality of life. Based on care provider report and observation, less cognitive and functional impairment and no behavioral symptoms or depression were associated with better quality of life.

Tables 4 and 5 indicate statistically significant covariate adjusted associations between facility-level (Table 4) and resident-level (Table 5) components of care and quality of life. Looking first at change in quality of life over 6 months, adjusted quality of life was better (declined less) in facilities with specialized workers, with more staff training in more areas (supervisor and direct care staff), and that encouraged activity participation more frequently (all  $p < .05$ ). No resident-level components of care were associated with change in quality of life at this statistical level, nor were the many other facility-level components under study.

Further, while facility type and many other facility characteristics were not significantly related to cross-sectional quality of life in adjusted analyses (facility size, age, affiliation, percent dementia beds, and dementia and ADL impairment case-mix), a better environment was related to worse quality of life reported by care providers (QOL in AD–negative affect, and QOL-AD) but better observed quality of life on the DCM BCC Type I codes (SCU-EQS  $p < .05$  for all). Similarly, while many staff variables were not significantly related to quality of life (universal worker, RN, LPN, and aide FTEs; administrator and aide turnover; and extent hire for experience), more stability in staff-resident assignment was related to worse quality of life as reported by the care provider. Larger numbers of contract workers on staff were related to better quality of life as reported by residents and care providers, and higher RN and LPN turnover was related to worse quality of life on the observation of DCM well-being.

The remaining rows on Table 4 indicate the diversity with which policies and practices relate to quality of life. While virtually all policies and practices under study related to quality of life, they did so inconsistently across different measures. For example, having more flexible admission, discharge, and acceptance of problem behavior policies related positively to care provider report of QOL in AD–positive affect, and involving professional staff in care planning related positively to resident reported QOL-AD and observed affect (PGC-ARS). The

**Table 1. Distribution of Facility-Level Components of Dementia Care in the Study Sample**

Facility-Level Characteristic <sup>a</sup>	M (SD) or % <sup>b</sup>
<b>Demographics</b>	
Type	
RC/AL	
< 16 bed	31.1%
Traditional	24.4%
New-model	22.2%
Nursing home	22.2%
Size (no. of beds)	61.8 (52.2)
Age (years)	19.8 (20.7)
For profit	75.6%
Affiliated	22.2%
Chain	44.4%
Dementia-specific beds (%)	29.9 (40.4)
Case-mix (all facility residents)	
Percent with dementia	55.7 (24.4)
Average percent with ADL impairment (of 6) <sup>c</sup>	56.5 (24.1)
Physical environment (observed) <sup>c</sup>	
SCU-EQS (0–38)	23.6 (5.6); 25.2 (5.2)
AL-EQS (0–30)	11.9 (4.0); 13.4 (4.3)*
<b>Staffing</b>	
Stability of staff-resident assignment (0–5) <sup>c</sup>	3.6 (1.8); 3.1 (1.8)
Universal worker philosophy	58.3%; 58.8%
Specialized worker philosophy	37.5%; 38.2%
Nursing (FTE, RN or LPN, per 10 residents)	1.2 (1.3)
Aide (FTE per 10 residents)	4.1 (2.2)
Extent hire for experience (1–5) <sup>c</sup>	3.0 (1.1)
Contract workers	
Percent of nursing (RN, LPN) by contract workers	11.3 (24.5)
Percent of personal care by contract workers	2.1 (6.5)
Annual turnover (%)	
Administrator	9.3 (34.4)
RN and LPN	46.4 (59.9)
Nurse aide	72.1 (92.3)
<b>Policies and Practices</b>	
Permissive admission policies (of 24, %)	88.3 (9.2); 83.9 (11.5)
Permissive discharge policies (of 24, %)	89.1 (7.8); 86.8 (9.6)
Acceptance of problem behaviors (of 16, %)	23.1 (15.6); 13.1 (11.5)*
Policy choice (of 7, %)	56.5 (28.5)
<b>Care planning<sup>c</sup></b>	
Professional staff involvement (0–3)	2.1 (1.1)
Aide involvement (0–3)	1.9 (1.2)
<b>Formal training, last year (in 6 areas)<sup>c</sup></b>	
Supervisors (0–12)	8.3 (4.0)
Direct care staff (0–12)	8.0 (3.9)
<b>Assessment<sup>c</sup></b>	
Professional (of 6 areas)	5.5 (0.8); 5.3 (1.4)
Written, standardized (of 6 areas)	3.0 (2.0); 2.7 (2.2)
<b>Treatment</b>	
Professional (average percent across 6 areas) <sup>c</sup>	30.3 (16.7); 28.0 (14.3)
Other or informal (of 6 areas) <sup>c</sup>	4.6 (1.7); 4.7 (1.7)
Perceived success (of 6 areas) <sup>c</sup>	4.9 (1.4)

**Table 1. (Continued)**

Facility-Level Characteristic <sup>a</sup>	M (SD) or % <sup>b</sup>
Percent on antipsychotic or sedative hypnotic	47.7 (27.6)
Encouragement of activities (0–4) <sup>c</sup>	2.4 (0.7); 2.2 (0.5)*
Use of stimuli by residents with dementia (0–4) <sup>c</sup>	2.1 (0.8)

Notes: RC/AL = residential care/assisted living; ADL = activity of daily living; SCU-EQS = Special Care Unit-Environmental Quality Scale; AL-EQS = Assisted Living-Environmental Quality Scale; RN = registered nurse; LPN = licensed practical nurse. For the table,  $N = 45$  facilities.

<sup>a</sup>All data are from administrator interview, except physical environment (which was based on direct observation) and medication use (which was aggregated from supervisor reports of residents enrolled in this study). The sample size for facilities varied from 41–45 because of missing data.

<sup>b</sup>Characteristics with two values shown were measured separately for dementia-specific and non-dementia-specific care areas within facilities. The first value is for the dementia-specific portion ( $n = 24$ ); the second is for the non-dementia-specific portion ( $n = 35$ ). Ten facilities were entirely dementia specific, 14 were partially dementia specific, and the remaining 21 had no area designated for dementia-specific care.

<sup>c</sup>ADLs include eating, dressing, walking, transferring, bathing, and continence; SCU-EQS and AL-EQS are explained in the text; staffing stability was scored from 0 = changes more than once a week to 5 = never changes (average between 3 and 4 indicates changes between monthly and less than once a month); extent hire for experience is the extent to which the facility tries to hire workers with training and/or experience in dementia care, scored from 1 = not at all to 5 = extremely (3 corresponds to moderately); policies are explained in the text; care planning is frequency of involvement in formal care plan meetings, scored from 0 = never to 3 = weekly and (for professional staff) was averaged across eight types of staff (2 corresponds to 1–3 times a month); formal training is a summary score for the proportion of supervisory and direct care staff with formal training in detection and treatment of problems in each of six care areas (pain, depression, ambulation, eating, drinking, behavioral symptoms), scored as 0 = none, 1 = 1–74%, 2 = 75% or more; assessment is the number of six care areas in which the facility or unit uses professional assessment by medical personnel or written, standardized assessment; professional treatment is the average percent of residents who received ongoing professional treatment for problems in each of the six care areas during the past year; other, informal treatment is the number of six care areas in which the facility uses such treatment; perceived success is the number of these six care areas for which the administrator felt the facility was “quite a bit” or “extremely” successful in treating residents; encouragement of activities is for 10 activities, and was the average frequency (scored as 0 = never to 4 = several times a day) that the activity was provided and resident participation encouraged (2 corresponds to between one and 6 days per week); and use of stimuli is for seven types of stimuli, and was the average frequency (scored as 0 = never to 4 = several times a day) that the stimuli were available and used by at least 1 resident with dementia (2 corresponds to between 1 and 6 days per week).

\* $p < .05$  for difference between dementia-specific care area and non-dementia-specific care area, based on resident-level analysis in which residents are assigned a value based on area of residence, using GEE applied to linear or logistic regression for continuous and dichotomous characteristics, respectively, to account for clustering within facilities.

strongest association for resident-reported quality of life was witnessed for facility use of antipsychotic and sedative hypnotic medications (negatively associated with QOL-AD,  $p < .01$ ). The one facility-level

**Table 2. Distribution of Resident-Level Components of Dementia Care, Overall and by Residence in Dementia Specific Care Area or Facility**

Resident-Level Characteristic <sup>a</sup>	M (SD) or %		
	Overall (N = 421)	In Dementia Specific Care Area or Facility (N = 170)	In Nondementia Specific Care Area or Facility (N = 239)
Reported and observed care (%)			
Use of cholinesterase inhibitor	29.2	35.3	26.0
Observation (ever observed)			
In restraints	13.2	12.4	12.8
Ungroomed appearance	19.8	18.8	19.8
Unsuitable appearance	7.6	6.3	7.9
Staff experience, perceptions and observed behaviors			
Experience in current position <sup>b</sup>			
Supervisor (1–5)	4.3 (1.0)	4.1 (1.0)	4.5 (0.9)*
Direct care provider (1–5)	4.4 (0.9)	4.4 (0.9)	4.3 (1.0)
Perceptions of direct care provider <sup>b</sup>			
Approaches to care, total (19–95)	71.1 (7.0)	71.9 (6.5)	70.7 (7.3)
Hope (8–40)	24.2 (4.5)	24.3 (4.5)	24.2 (4.7)
Person-centered (11–55)	46.9 (4.2)	47.6 (4.4)	46.4 (4.1)
Work stress (1–5)	1.8 (0.5)	1.8 (0.6)	1.8 (0.5)
Work satisfaction (0–84)	62.2 (10.3)	62.7 (9.8)	62.1 (10.7)
Observation (0–100%) <sup>c</sup>			
Percent, communication	19.7 (18.3)	21.9 (17.3)	18.0 (19.1)
Percent, personal detractors	3.4 (6.5)	3.2 (4.8)	3.6 (7.8)
Percent, positive person work	19.2 (16.3)	22.0 (15.4)	17.2 (16.9)*
Percent, physical contact	7.6 (9.0)	9.2 (9.1)	6.2 (8.8)*
Family involvement (hr/week)	6.8 (7.2)	6.2 (6.7)	7.3 (7.5)

Notes: For the table, N = 421 residents.

<sup>a</sup>Data are from supervisor, direct care provider, and family interview, or direct observation (36 observations, conducted every 5 minutes over three nonmealtime hours for restraint use, communication, personal detractors, positive person work, and physical contact; and on three observations conducted during the first 5 minutes of each hour for appearance). Direct observations were completed for 333 residents (138 in dementia-specific care areas or facilities and 187 in non-dementia-specific care areas or facilities). For measures derived from interviews, the sample size varies from 343–379 for the overall sample, from 129 to 154 for residents of dementia-specific care areas or facilities, and from 196 to 228 for residents of non-dementia-specific care areas or facilities, because of missing data. Location of residence (special care area vs not) was unknown for 12 residents of one facility; these residents were included in the overall estimates but excluded from the area-specific estimates.

<sup>b</sup>Experience was scored as: 1 = < 1 month; 2 = 1–5 months; 3 = 6–11 months; 4 = 1–2 years; 5 = > 2 years. Approaches to care (Lintern, Woods, & Phair, 2000a, 2000b) was based on the sum of responses to 19 items (each scored from 1 = strongly agree to 5 = strongly disagree) regarding approaches to dementia and attitudes towards individuals with dementia; the hope subscale included 8 items, and the person-centered subscale included 11 items, with higher scores indicating more positive attitudes. Work stress was the Work Stress Inventory (Schaefer & Moos, 1993), the average of the frequency (each scored 1 = never to 5 = often) for 45 work stressors, with higher scores indicating greater stress. Work satisfaction was the Experience of Work with Demented Residents measure (Åström et al., 1991) and was the sum of 21 items, each scored 0 = not at all to 4 = extremely, with higher scores indicating greater satisfaction.

<sup>c</sup>Each of the observational items was the percent of observations (out of up to 36 per resident) during which the item was observed. Communication refers to communication from staff. Personal detractors and positive person work are explained in the text. Physical contact refers to observed contact with staff or other residents.

\* $p < .05$  for difference between dementia-specific care area and non-dementia-specific care area, based on resident-level analysis in which residents were assigned a value based on area of residence, using GEE applied to linear or logistic regression for continuous and dichotomous characteristics, respectively, to account for clustering within facilities.

component of care that related to quality of life as assessed by residents, care providers, and observation was the provision of professional treatment for the six care areas under study; it was negatively related to quality of life as reported by residents (DQOL) and observed (DCM BCC Type I codes), but positively related to care provider reports (QOL in AD–positive affect).

In addition, one component of resident-level care related to quality of life across all three sources (see

Table 5). Residents who were observed to be ungroomed reported their own quality of life to be worse (QOL-AD), as did care providers (QOL in AD–activity) and observation (DCM BCC Type I codes). Residents who had staff who espoused more dementia-sensitive attitudes (especially hope) rated their quality of life higher on two measures (DQOL and QOL in AD–activity). Observed interactional style (more communication, positive person work, and physical contact, fewer personal detractors) was

Table 3. Distribution of Quality of Life Score, by Facility Type and Resident Characteristics

Characteristic	Resident Report <sup>a</sup>					Direct Care Provider Report <sup>a</sup>					Observation <sup>a</sup>		
	DQOL (n = 100)	AD-Activity (n = 110)	QOL-AD (n = 120)	ADRQL (n = 410)	QOL in AD-Activity (n = 400)	QOL in AD- Positive Affect (n = 403)	QOL in AD-Negative Affect (n = 383)	QOL-AD (n = 410)	QOL-AD, Raw Change <sup>a</sup> (n = 402)	QOL-AD, Adjusted Change (n = 402)	PGC-ARS (n = 333)	DCM, % BCC Type I (n = 333)	DCM, WIB (n = 333)
Overall	421 17.5 (0.4)	9.5 (0.6)	42.8 (1.0)	75.2 (0.9)	9.3 (0.4)	11.9 (0.2)	6.7 (0.2)	36.9 (0.5)	-2.4 (0.5)**	0.00 (0.47)	33.6 (0.5)	35.4 (1.9)	.74 (.04)
Facility type													
Nursing home (reference)	137 18.3 (0.7)	10.1 (1.2)	42.1 (1.0)	71.3 (1.8)	8.3 (0.5)	11.0 (0.3)	7.2 (0.4)	34.6 (1.0)	-1.8 (0.7)	-0.18 (0.73)	32.0 (0.8)	29.1 (3.2)	.54 (.07)
< 16 beds	48 16.0 (1.3) <sup>†</sup>	7.2 (1.2)	39.0 (3.2)	76.6 (2.5) <sup>†</sup>	9.3 (1.1)	11.8 (0.6)	6.2 (0.5)	37.7 (1.3) <sup>†</sup>	-2.2 (1.1)	0.54 (1.12)	32.9 (0.6)	45.2 (5.0)*	.80 (.06)**
Traditional	101 17.7 (0.5)	9.8 (1.0)	44.7 (1.4)	79.9 (1.8)**	9.9 (0.8)	12.7 (0.3)**	6.3 (0.4)	38.9 (1.0)**	-2.7 (1.3)	0.48 (1.07)	34.6 (1.1)*	40.9 (4.9) <sup>†</sup>	.90 (.06)**
New-model	135 17.3 (0.7)	9.8 (1.4)	42.8 (1.7)	75.2 (1.2) <sup>†</sup>	10.0 (0.7)	12.1 (0.3) <sup>†</sup>	6.5 (0.3)	37.6 (0.9) <sup>†</sup>	-3.0 (0.9)	-0.38 (0.91)	35.0 (0.8)*	33.9 (2.7)	.81 (.06)**
Length of stay													
< 12 months	94 17.2 (0.6)	9.8 (0.8)	42.3 (1.3)	78.5 (2.2) <sup>†</sup>	10.3 (0.7)*	12.0 (0.3)	6.4 (0.4)	39.4 (1.1)**	-3.7 (1.0)	-0.39 (0.86)	34.7 (1.1)	38.7 (3.7)	.84 (.06) <sup>†</sup>
≥ 1 year	276 17.4 (0.6)	9.1 (0.9)	42.3 (1.4)	73.8 (1.1)	9.1 (0.4)	11.8 (0.2)	6.7 (0.2)	36.1 (0.6)	-2.0 (0.6)	0.03 (0.56)	33.4 (0.4)	35.5 (2.2)	.72 (.04)
Age													
< 85 years	203 17.5 (0.5)	9.5 (0.8)	43.1 (1.2)	74.1 (1.3)	9.6 (0.5)	11.7 (0.3)	6.9 (0.3) <sup>†</sup>	36.6 (0.7)	-1.7 (0.6)	0.61 (0.58) <sup>†</sup>	34.1 (0.6)	36.8 (2.4)	.79 (.04) <sup>†</sup>
≥ 85 years	206 17.5 (0.7)	9.5 (0.9)	42.2 (1.5)	75.9 (1.2)	9.1 (0.4)	12.0 (0.2)	6.4 (0.2)	37.3 (0.6)	-3.4 (0.6)	-0.86 (0.62)	33.3 (0.6)	34.1 (2.4)	.70 (.05)
Gender													
Male	88 18.1 (0.6)	10.8 (1.4)	43.6 (1.5)	75.8 (1.8)	8.9 (0.5)	11.9 (0.4)	6.4 (0.4)	37.0 (0.8)	-2.7 (0.9)	-0.36 (0.86)	32.8 (0.6)	33.1 (3.2)	.72 (.05)
Female	333 17.3 (0.5)	9.1 (0.6)	42.5 (1.0)	75.0 (1.0)	9.5 (0.4)	11.9 (0.2)	6.7 (0.2)	36.9 (0.6)	-2.3 (0.5)	0.09 (0.49)	33.8 (0.5)	36.0 (2.2)	.75 (.04)
Race													
White	338 17.3 (0.4)	9.1 (0.7)	42.2 (1.0)	74.4 (1.0)	9.3 (0.4)	11.8 (0.2)	6.8 (0.2) <sup>†</sup>	36.8 (0.6)	-2.5 (0.6)	-0.18 (0.52)	33.5 (0.5)	34.8 (2.0) <sup>†</sup>	.75 (.04)
Non-White	35 17.8 (1.6)	10.2 (1.7)	44.1 (3.0)	78.9 (2.8)	10.4 (1.2)	12.2 (0.5)	5.6 (0.5)	38.4 (1.5)	-2.1 (1.6)	0.85 (1.60)	35.2 (1.6)	49.3 (5.2)	.70 (.15)
Married													
Yes	52 18.3 (0.9)	11.0 (2.1)	43.7 (2.0)	72.1 (2.5)	9.0 (0.8)	11.2 (0.4)	7.4 (0.5) <sup>†</sup>	36.5 (1.3)	-3.9 (1.0)	-1.65 (0.92)	31.2 (0.9)**	32.8 (4.2)	.68 (.09)
No	279 17.1 (0.4)	9.2 (0.7)	42.1 (1.1)	75.2 (1.2)	9.6 (0.4)	12.0 (0.2)	6.6 (0.2)	36.9 (0.6)	-2.1 (0.6)	0.25 (0.55)	34.3 (0.6)	37.7 (2.5)	.75 (.04)
Cognitive impairment													
Mild to moderate	152 17.5 (0.4)	9.5 (0.6)	42.8 (1.0)	82.4 (1.1)**	11.1 (0.6)**	12.5 (0.3)**	5.8 (0.3)**	40.6 (0.7)**	-2.1 (0.8)	1.65 (0.73)**	36.1 (0.8)**	44.3 (3.2)**	.92 (.05)**
Severe to very severe	259 —	—	—	71.1 (1.1)	8.4 (0.4)	11.5 (0.2)	7.1 (0.2)	34.9 (0.6)	-2.6 (0.6)	-0.93 (0.54)	32.3 (0.5)	31.6 (1.8)	.66 (.05)
Behavioral symptom													
None	141 16.9 (0.5)	9.0 (0.8)	41.3 (1.3)	79.1 (1.2)**	10.1 (0.6)**	12.1 (0.3)*	5.9 (0.3)**	38.2 (0.7)**	-2.5 (0.9)	0.33 (0.85)	34.7 (0.7)*	41.3 (3.2)*	.87 (.04)**
≥ 1	206 17.8 (0.5)	9.9 (0.8)	43.5 (1.3)	71.9 (1.4)	8.9 (0.5)	11.6 (0.3)	7.2 (0.3)	35.9 (0.7)	-2.3 (0.7)	-0.22 (0.60)	33.1 (0.6)	33.6 (2.4)	.66 (.06)
Functional impairment													
0-4 ADLs	198 17.4 (0.4)	9.3 (0.7)	42.1 (1.1)	78.3 (1.3)**	10.5 (0.6)**	12.1 (0.2)	6.3 (0.3)	39.6 (0.7)**	-3.2 (0.8)	0.22 (0.71)	35.0 (0.6)**	39.2 (2.7) <sup>†</sup>	.87 (.03)**
5-7 ADLs	164 17.1 (0.8)	9.1 (1.5)	42.2 (1.8)	70.6 (1.3)	8.3 (0.4)	11.5 (0.3)	7.1 (0.3)	33.7 (0.6)	-1.5 (0.6)	-0.29 (0.58)	31.9 (0.6)	32.5 (2.3)	.59 (.06)
Comorbidity													
0-2	230 17.6 (0.4)	9.1 (0.7)	43.6 (1.1)*	75.2 (1.2)	9.3 (0.5) <sup>†</sup>	11.9 (0.2)	6.5 (0.3)	37.0 (0.6)	-2.6 (0.6)	-0.20 (0.60)	34.2 (0.5)	37.5 (2.5)	.81 (.03)*

(Table continues on next page)

Table 3. (Continued)

Characteristic	Resident Report <sup>a</sup>				Direct Care Provider Report <sup>a</sup>				Observation <sup>a</sup>					
	DQOL (n = 100)	QOL in AD-Activity (n = 110)	QOL-AD (n = 120)	ADRQL (n = 410)	QOL in AD-Activity (n = 400)	QOL in AD- Positive Affect (n = 403)	QOL in AD-Negative Affect (n = 383)	QOL-AD, Raw Change <sup>a</sup> (n = 402)	QOL-AD, Adjusted Change (n = 402)	PGC-ARS (n = 333)	DCM, % BCC Type I (n = 333)			
≥ 3	131	16.6 (0.6)	9.5 (1.2)	40.0 (1.5)	74.9 (1.5)	9.3 (0.5)	11.8 (0.3)	6.8 (0.3)	36.8 (0.8)	-2.1 (0.8)	0.25 (0.77)	32.9 (1.0)	34.4 (2.7)	.65 (.07)
Depressed														
No	261	17.3 (0.4)	9.7 (0.7)	42.3 (1.0)	77.2 (1.1) <sup>***</sup>	9.6 (0.4)	12.1 (0.2) <sup>**</sup>	6.2 (0.2) <sup>***</sup>	37.6 (0.6) <sup>***</sup>	-2.2 (0.6)	0.40 (0.60) <sup>*</sup>	34.3 (0.6) <sup>†</sup>	38.5 (2.6) <sup>**</sup>	.77 (.04) <sup>†</sup>
Yes	86	17.1 (1.6)	6.9 (1.4)	41.9 (3.1)	67.8 (2.1)	8.9 (0.6)	11.0 (0.4)	8.0 (0.5)	34.5 (1.0)	-2.7 (0.9)	-1.21 (0.86)	32.0 (0.8)	30.7 (3.3)	.64 (.08)

Notes: DQOL = Dementia Quality of Life; QOL in AD = Quality of Life in Alzheimer's Disease; QOL-AD = Quality of Life-Alzheimer's Disease; ADRQL = Alzheimer Disease Related Quality of Life; PGC-ARS = Philadelphia Geriatric Center Affect Rating Scale; DCM % BCC = Dementia Care Mapping Behavior Category Code (percent of Type I observations); WIB = well- or ill-being; ADLs = activities of daily living. Table values are mean (SE). For resident-reported measures, standard errors are adjusted for clustering within facility; for direct-care-provider-reported measures, standard errors are adjusted for clustering within care provider and facility; for observed measures, standard errors are adjusted for clustering within observer and facility. The Ns at the top of each column indicate the total number with data for that quality-of-life measure. Due to missing data on resident characteristics, the sample size for measures derived from resident report ranged from 87 to 120, direct care provider report varied from 302 to 410, and those derived from observation ranged from 263 to 333. Higher scores indicate better quality of life, except for one item: direct care provider report, QOL in AD-Negative Affect.

<sup>a</sup>With the exception of comparing the overall mean to zero with a paired *t* test, statistical comparisons were not made on raw change.

\**p* < .05; \*\**p* < .01; \*\*\**p* < .001; <sup>†</sup>*p* < .10, adjusted for clustering as noted above.

positively related to care provider-rated and observed quality of life. Finally, family involvement was related to higher QOL in AD-activity, as rated by care providers.

## Discussion

Just as the measurement of quality of life is complex and multifaceted (Sloane et al., 2005, this issue), so too is the study of how care relates to quality of life. On the one hand, some argue that such study requires longitudinal assessment, assessing care at baseline, and quality of life at baseline and follow-up, and then relating care to change in quality of life (Gonzalez-Salvador et al., 2000; Ready & Ott, 2003). Only one other study has completed a longitudinal assessment of dementia quality of life in long-term care (using the ADRQL), finding a small (5 percentage points) and potentially clinically inconsequential decline in quality of life over 2 years (with some residents showing improved quality of life over time); further, there was no association between change and resident status at baseline (Lyketsos et al., 2003). Using a different measure, the 15-item QOL-AD (ranging from 15 to 60, with a baseline mean of 36.9, *SE* 0.5), the current study similarly found little (albeit significant) change over time (raw change -2.4, *SE* 0.05, *p* < .0001), and for 36% of the residents, improvement of at least one point over the 6-month study interval. The authors of the ADRQL study postulated that the lack of decline in their sample might reflect the high quality of care in the one facility in which their study was conducted—which hypothetically moderated the expected decline—and called for a comparative study to tease out such relationships.

The present study of care provided to 421 residents in 45 facilities was designed to do just that. At follow-up, residents fared better in facilities with specialized workers, with more staff training in more areas (supervisor and direct care staff), and that encouraged activity participation more frequently. Specifically, mean raw change was -1.3 (*SD* 7.4) versus -3.0 (*SD* 8.2) in facilities with specialized workers compared to those without. In facilities in which 75% or more of supervisors were trained in at least five of the six domains, raw mean change was -1.0 (*SD* 8.3) versus -3.4 (*SD* 7.5); comparable figures for care provider training were -0.4 (*SD* 7.6) vs -3.5 (*SD* 7.9). In facilities that encouraged activities once a day or more, it was -1.9 (*SD* 7.8) versus -2.6 (*SD* 8.0). Interestingly, these are all facility-level variables, and none of the resident-level components of care related to change in quality of life. On the one hand, such findings are promising because they imply that facility-wide change can impact resident well-being; on the other, they call into question the degree to which individualized care is benefiting residents with dementia. It must be acknowledged, however, that this study may not

Table 4. Statistically Significant Covariate Adjusted HLM-Based Tests of Association Between Facility-Level Components of Care and Quality of Life

Facility-Level Component of Care	Direct Care Provider Report										Observation						
	Resident Report					QOL in AD					QOL-AD, Raw Change (n = 295)	QOL-AD, Adjusted Change (n = 295)	PGC-ARS (n = 245)	DCM, % BCC Type I (n = 245)	DCM, WIB (n = 245)		
	DQOL (n = 84)	QOL in AD-Activity (n = 92)	QOL-AD (n = 101)	ADRQL (n = 302)	QOL in AD-Activity (n = 296)	QOL in AD-Positive Affect (n = 296)	QOL in AD-Negative Affect (n = 281)	QOL-AD (n = 301)	QOL-AD, Raw Change (n = 295)								
Demographics																	
For profit						+											-*
Chain																	+**
SCU-EQS						+											+**
AL-EQS						+											+**
Staffing																	
Stability																	
Specialized worker																	
RN or LPN (contract)																	
Aide (contract)																	
RN and LPN turnover																	
Policies and practices																	
Admission policies																	
Discharge policies																	
Accept problematic behavior																	
Policy choice																	
Care planning																	
Professional staff																	
Aide																	
Training																	
Supervisor																	
Care staff																	
Assess																	
Professional Standardized																	
Treat																	
Professional																	
Other, informal																	
Perceived success																	
Use of antipsychotic or sedative hypnotic																	
Encourage activities																	
Use of stimuli																	

Notes: HLM = hierarchical linear model; DQOL = Dementia Quality of Life; QOL in AD = Quality of Life in Alzheimer's Disease; QOL-AD = Quality of Life-Alzheimer's Disease; ADRQL = Assisted Living Environmental Quality Scale; QOL-AD, Raw Change = Philadelphia Geriatric Center Affect Rating Scale; DCM % BCC = Dementia Care Mapping Behavior Category Code (percent of Type I observations); WIB = well- or ill-being; SCU-EQS = Special Care Unit Environmental Quality Scale; AL-EQS = Assisted Living Environmental Quality Scale; RN = registered nurse; LPN = licensed practical nurse. The sample size at the top of each column is the number of residents with data on that quality-of-life measure and all the covariates. Sample sizes vary among the rows from 71 to 101 for resident-reported quality of life, 241 to 302 for care-provider-reported quality of life, and 211 to 245 for observed quality of life. Columns with a "+", or "+\*\*", or "+\*\*\*" indicate positive and negative associations, respectively, based on hierarchical linear models with the specified quality-of-life measure as the dependent variable. For resident-reported measures, models included a random effect for facility. For care-provider-reported measures, models included random effects for facility and care provider (nested within facility). For observed measures, models included random effects for facility and observer. Associations were additionally adjusted for facility type (RC/AL vs nursing home) and resident gender, cognitive deficit, behavioral symptoms, ADL impairment, comorbidity, and depressive symptoms; associations with care provider report and observed measures were further adjusted for resident tenure, age, race and marital status. Facility type, size, age, affiliation, percent dementia beds, dementia and ADL impairment case-mix; universal worker; RN, LPN, and aide FTEs; administrator and aide turnover; and extent hire for experience were not significantly associated with any quality-of-life measures ( $p > .10$ ).

\* $p < .10$ ; \*\* $p < .05$ ; \*\*\* $p < .01$ .

Table 5. Statistically Significant Covariate Adjusted HLM-Based Tests of Association Between Resident-Level Components of Care and Quality of Life

Resident-Level Component of Care	Resident Report				Direct Care Provider Report				Observation				
	DQOL AD-Activity (n = 84)		QOL in AD-Activity (n = 92)		QOL AD-Positive AD-Negative Affect (n = 296)		QOL in QOL in AD-Negative Affect (n = 281)		QOL-AD, Adjusted Change (n = 295)		QOL-AD, Adjusted Change (n = 295)		DCM, % (n = 245)
	NA	NA	NA	NA	+	+	+	+	+	+	+	+	+
Reported and observed care													
Dementia area													
Cholinesterase inhibitor													
Restraints, ever <sup>a</sup>	NA	NA	NA	NA	+	+	+	+	+	+	+	+	+
Ungroomed appearance and observed behavior													
Approaches													
Total	+	+	+	+	+	+	+	+	+	+	+	+	+
Hope	+	+	+	+	+	+	+	+	+	+	+	+	+
Person-centered	+	+	+	+	+	+	+	+	+	+	+	+	+
Work stress													
Work satisfaction													
Communication													
Personal detractors													
Positive person work													
Physical contact													
Family involvement													

Notes: HLM = hierarchical linear model; DQOL = Dementia Quality of Life; QOL in AD = Quality of Life in Alzheimer's Disease; QOL-AD = Quality of Life-Alzheimer's Disease; ADRQL = Alzheimer Disease Related Quality of Life; PGC-ARS = Philadelphia Geriatric Center Affect Rating Scale; DCM % BCC = Dementia Care Mapping Behavior Category Code (percent of Type I observations); WIB = well- or ill-being. The sample size at the top of each column is the number of residents with data on that quality-of-life measure and all the covariates. Sample sizes vary among the rows from 63 to 101 for resident-reported quality of life, 220 to 302 for care-provider-reported quality of life, and 198 to 245 for observed quality of life. Columns with a "+" or "-" indicate positive and negative associations, respectively, based on hierarchical linear models with the specified quality-of-life measure as the dependent variable. For resident-reported quality-of-life measures, models included a random effect for facility. For care-provider-reported quality-of-life measures, models included random effects for facility and care provider (nested within facility). For observed measures, models included random effects for facility and observer. Associations were additionally adjusted for facility type (RC/AL vs nursing home) and resident gender, cognitive deficit, behavioral symptoms, ADL impairment, comorbidity, and depressive symptoms; associations with care provider report and observed measures were further adjusted for resident tenure, age, race and marital status. Unsuitable appearance and experience of supervisor and direct care staff were not significantly associated with any quality-of-life measures ( $p > .10$ ).

<sup>a</sup> Association of restraint use with resident-reported quality of life cannot be estimated, as those residents reporting quality of life were never observed in restraints. \* $p < .10$ ; \*\* $p < .05$ ; \*\*\* $p < .01$ .

have had sufficient power to detect some of these associations—but even if it did, they likely would have been small, and, similar to the ADRQL study, of questionable clinical relevance. Nonetheless, considering this acknowledged limitation, the fact that three components of care related to change over time may highlight the utility of turning attention to the areas of specialized workers, staff training, and encouragement of activity participation. In one area this attention may spark debate, as many states promote the practice of universal workers (Mollica, 2002), and the expanded use of specialized workers may change demands for care.

The authors of the ADRQL study concluded that the ADRQL is sensitive to change over time (although noted that such sensitivity might be limited) and appropriate for use as an outcome measure in intervention studies. In the current study, change in quality of life measured with the QOL-AD was significantly different over an even shorter period of time (6 months as opposed to 2 years); also, it detected a significant relationship with cognitive and affective status (such that a more favorable status at baseline related to relatively better quality of life at follow-up) and was markedly lower for residents immediately before the time of discharge or death compared to those who remained in the facility through 6 months (raw change  $-4.7$  [ $SD$  7.7] vs  $-1.7$  [ $SD$  7.9]). Finally, the fact that the QOL-AD detected differences among components of care further merits its consideration as an outcome measure. It might be a particularly useful measure if interest was in how the resident rated his or her quality of life, as the patient version of the QOL-AD can be reliably and validly completed by those with a MMSE score as low as 10; the degree to which this version is sensitive to change is unknown, however (Logsdon, Gibbons, McCurry, & Teri, 2002).

If one were of a different mindset, one would recognize that a longitudinal study comparing care to quality of life in a cohort of current residents (as opposed to a new admissions cohort) may be insensitive to the effects the care environment had exerted since the time of admission. In such a case, a cross-sectional comparison of care to quality of life, adjusting for resident status, might best indicate this relationship. In making those comparisons, this study found many associations of care to outcomes; given the multiple comparisons, it is best to focus on the detected patterns.

The 11 measures used in this study define quality of life differently and from three different vantage points. None constitutes a gold standard, although many suggest that the resident's point of view should take priority (Brod et al., 1999). In this study, we could conduct analyses for at most 120 resident reports, and significant associations with so modest a sample are worthy of discussion. From the resident's perspective, quality of life was higher for those in facilities that more frequently involved more

staff in care planning and whose care providers felt more hope (e.g., that residents can make decisions, that they will not inevitably go “down hill,” and that feeling attached to residents need not be avoided). Also, quality of life was lower in facilities that provided more treatment, including antipsychotic and sedative hypnotic medications, and when residents themselves were ungroomed. Other authors have found a relationship between anxiolytic treatment and reduced quality of life, and the likely explanation is that more intense treatment is used (not entirely successfully) for residents who are more impaired (a relationship that persisted despite controlling for resident status in these analyses; Gonzalez-Slavador et al., 2000).

A limitation of relating care provider assessments of quality of life to outcomes is that such assessments are influenced by caregiver factors (Gonzalez-Slavador et al., 2000; Karlawish, Casarett, Klocinski, & Clark, 2001; Winzelberg, Williams, Preisser, Zimmerman, & Sloane, 2005, this issue). Thus, it may come as no surprise that residents with whom workers communicate more and toward whom they display positive person work (e.g., enable the resident to do what he or she couldn't otherwise do) tend to be rated more highly. One finding to note is that these same interpersonal components are related to observational indicators of quality of life, such that these residents display more positive affect, behaviors, and general well-being. Thus, to the extent that workers have the time and can feel and act positively toward residents, quality of life is likely to be improved. Further, these attitudes relate to worker satisfaction as well, and so all parties may benefit when positive interactions are maximized (Zimmerman, Williams, et al., 2005, this issue). Finally, contrary to conventional wisdom, more stability in staff-resident assignment was related to worse staff ratings of quality of life (but not to resident or observer ratings of quality of life). Whether stability is affecting care provider attitudes (and hence ratings), or whether it is actually affecting resident quality of life is not known. A recent study showed no clear superiority of permanent versus rotating staffing, and so this area merits further attention (Burgio, Fisher, Fairchild, Scilley, & Hardin, 2004).

Finally, it would be remiss to not stress the fact that (a) resident appearance was related to at least one measure of quality of life as rated by residents, care providers, and observation, and (b) facility type (RC/AL vs nursing home) and number of dementia beds were not related to any quality-of-life measures. Grooming may be an inherent indicator of dignity and, as such, may be an implicit marker of poor quality of life. As far as setting of care, there is increasing evidence that the quality of care in nursing homes has been improving (Feldman & Kane, 2003) and no overwhelming indication that special dementia care is related to better outcomes (Phillips

et al., 1997). Thus, while RC/AL developed in part so that older adults could avoid nursing home placement, the tide may have turned, and these settings may be less different than some consider—and equally suitable (although perhaps not equally affordable) for the care of residents with dementia (Kane & Wilson, 2001; Zimmerman et al., 2003). At minimum, it is likely that such gross categorizations of care (RC/AL, nursing home) do not relate to differences in care that are affecting resident quality of life.

What then do these myriad findings suggest? They certainly suggest directions for hypothesis generation and further exploration and evaluation. While causal attribution is not possible, the findings suggest that facilities should consider (and studies should evaluate) using a specialized worker perspective, train all staff in domains central to dementia (depression, pain, behavioral symptoms, ambulation, nutrition, and hydration), and encourage activity participation (related to change in quality of life over time). They suggest that attention be paid to resident grooming (related to quality-of-life ratings by residents, staff, and observation). They suggest that facilities should involve staff in care planning, encourage care providers to feel more hope, and avoid antipsychotic and sedative hypnotic medications, if possible (related to resident perceptions of quality of life). They suggest that staff should communicate more, and positively, with residents (related to care provider rating and observed quality of life) and that rotating worker assignment be further explored (related to care provider rating). To the extent that all of these areas are under the control of the facility, and can be implemented with few new resources, all are worth consideration and evaluation to improve the quality of life of long-term care residents with dementia. In fact, the Alzheimer's Association is undertaking a national educational campaign, the Campaign for Quality in Residential Care, to implement and evaluate many of these components of care. Thus, the growth of evidence-based practice to improve the quality of life for residents with dementia in long-term care is evident, and promising.

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