Published in final edited form as:

J Aging Health. 2013 June ; 25(4): 574–588. doi:10.1177/0898264313480240.

The Influence of Cognitive Impairment, Special Care Unit Placement, and Nursing Facility Characteristics on Resident Quality of Life

Kathleen Abrahamson, PhD, RN¹, Teresa Lewis² [PhD Candidate], Anthony Perkins, MS³, Daniel Clark, PhD⁴, Arif Nazir, MD, CMD, FACP⁵, and Greg Arling, PhD^{3,4,5}

¹Department of Public Health, Western Kentucky University, Bowling Green, KY, USA

²Nursing Facility Rates and Policy, Minnesota Department of Human Services, St. Paul, MN, USA

³Regenstrief Institute, Inc., Indianapolis, IN, USA

⁴Indiana University Center for Aging Research Investigator, Indiana University School of Medicine, Indianapolis, IN

⁵Indiana University School of Medicine, Indianapolis, IN, USA

Abstract

Objectives—We examined the (a) influence of nursing facility characteristics on resident quality of life and (b) the impact of cognitive impairment and residence on a dementia special care unit(SCU) on QOL after controlling for resident and facility characteristics.

Method—Multilevel models (resident and facility) were estimated for residents with and without cognitive impairment on conventional units and dementia SCU. Data came from the 2007 Minnesota Nursing Home Resident Quality of Life and Consumer Satisfaction Survey ($N = 13,983$).

Results—Level of resident CI was negatively related to QOL, although residing on a dementia SCU was positively related to QOL. Certified Nursing Assistant and activity personnel hours per resident day had a positive relationship with resident QOL.

Discussion—Our results highlight the need to ensure adequate levels of paraprofessional direct care staff and the availability of dementia-focused (SCU)s despite current constraints on long-term care funding.

Keywords

nursing home (NH); quality of life (QOL); cognitive impairment (CI); facility characteristics

© The Author(s) 2013

Corresponding Author: Kathleen Abrahamson, PhD, RN, Department of Public Health, Western Kentucky University, 1906 College Heights Blvd., Bowling Green, KY 42101, USA. kathleen.abrahamson@wku.edu.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Reprints and permissions: sagepub.com/journalsPermissions.nav

The National Institute on Aging had no role in the design, methods, data analysis, or preparation of the paper.

Nursing home (NH) quality is a persistent concern for the millions of Americans that live or have loved ones residing in institutional long-term care environments. Measurement of NH quality has focused on clinical processes and outcomes, drawn particularly from the federal Minimum Data Set (MDS) assessment system, with relatively little attention to the quality of resident life (Castle & Ferguson, 2010). Existing research has illuminated clinical and demographic factors that influence resident quality of life (QOL) such as age, gender, functional status, cognitive impairment (CI) and depression (Abrahamson et al., 2012; Anderson, Wittrup-Jensen, Lolk, Andersen, & Kragh-Sorensen, 2004; Hoe et al., 2009; Logsdon, Gibbons, McCurry, & Teri, 2002; Selwood, Thorgrimsen, & Orrell, 2005). QOL is also influenced by psychosocial factors such as high levels of social engagement, a perception of life coherence or purpose, and the availability of purposeful activities (Degenholtz, Kane, Kane, Bershadsky, & King, 2006; Drageset et al., 2008; Zimmerman et al., 2005).

Our previous investigation found that QOL varied by level of cognitive impairment (CI) and placement on a dementia special care unit (SCU) (Abrahamson et al., 2012). The aim of the current analysis was to expand upon these findings and investigate the influence of facility characteristics on resident QOL while controlling for resident-level variables known to influence QOL. Using data derived from the Minnesota Nursing Home Resident and Consumer Satisfaction Survey we addressed two research questions: (a) Are facility characteristics such as staffing levels, ownership type, and presence of a special care unit associated with resident QOL? (b) Is resident placement on a dementia SCU associated with resident QOL when facility characteristics are accounted for in the model?

Background

Though clinical outcomes and processes of care have historically been the primary measures of NH quality, there is an increasing body of literature addressing factors that influence NH residents' overall QOL (Kane et al., 2003; Kane, 2001). There is evidence that resident QOL is a measureable and achievable outcome in NHs (Kane et al., 2003). (Sloane et al., 2005) found QOL is strongly related to level of CI and activities of daily living (ADL) dependency, consistent with the finding of Andersen et al. (2004) that dependence upon others for assistance with ADL's negatively influences QOL. Evidence indicates that QOL among NH residents is improved by high levels of social engagement, a perception of life coherence or purpose, and the availability of purposeful activities (Degenholtz et al., 2006; Drageset et al., 2008; Zimmerman et al., 2005).

Cognitive status alone or in combination with other factors can significantly influence an individual's perception of QOL. Our previous investigation found that resident QOL varied significantly by level of CI and placement on a dementia SCU (Abrahamson et al., 2012). Caregiving models and culture change initiatives that seek to increase resident QOL through organizational transformation make the assumption that facility context has a significant influence on QOL. Examples include 24-hr dining programs, flexible caregiving schedules, and "culture change" organizational models such as the Eden alternative and the Greenhouse model that focus on creating a resident-centered, household-like environment. Along these lines, Kane et al. (2004) found measurable differences between facilities in resident QOL,

and concluded that it was possible to differentiate between facilities in terms of resident QOL. Facility factors such as staffing, ownership type, specialized programming in the form of a designated SCU, and leadership style may have considerable influence on resident QOL and remain underinvestigated.

This current analysis expanded upon previous findings that resident-level factors influence QOL and addressed the influence of facility-level characteristics. Based upon the commonly held perception that characteristics of the facility environment have an influence on the NH resident experience, we predicted that facility characteristics would have a significant influence on NH resident QOL.

Our second research question addressed the specific influence of CI and SCU placement on resident QOL. Previous investigations finding a negative relationship between CI and QOL focused primarily on resident-level variables, excluding the influence of facility characteristics. It is possible that the negative influence of cognitive decline is mitigated by facility environments that provide particularly high quality clinical services, as indicated by the current quality indicators (QI), or address the unique needs of residents with dementia. This may be particularly true for residents living on dementia SCU, where special programming is intended to promote social engagement and activities that enhance resident's perception of QOL (Holmes et al., 1990; Gruneir, Lapane, Miller & Mor, 2008). Thus we expanded the analysis and investigated the relationship between level of cognitive impairment and QOL when controlling for resident and facility-level variables, and hypothesized that residents living within SCU will report a higher QOL than those who live within traditional NH units.

Method

Data and Sample—We analyzed data from the Minnesota Nursing Home Resident QOL and Consumer Satisfaction Survey conducted in spring 2007. This survey was sponsored by the state of Minnesota and administered by Vital Research, an independent survey organization, through face-to-face interviews with a representative sample of NH residents. Data were obtained by authors through a data-use agreement with the state of Minnesota. Respondents were selected from a probability sample of residents residing within each of the 390 Medicaid-certified NH in the state of Minnesota. The sample frame consisted of facility residents at the time of the survey. A list of all Medicaid-certified nursing facilities in Minnesota was provided to Vital Research by the Minnesota Department of Human Services. Interview staff then contacted each facility by telephone to schedule interviews. Facility administration provided interview staff with a list of all long stay residents 2 weeks prior to their interview date and a separate list of all short-stay residents on the date of the survey. The survey was administered to all sampled NH residents except the most severely cognitively impaired as indicated by an MDS Cognitive Performance Scale (CPS) score of 6, the acutely ill, or those whose guardian declined participation (about 5% of all eligible residents).

In facilities with fewer than 25 residents, interviews were attempted with each resident in the facility. In larger facilities each interviewer was provided with a randomly generated list of eligible long-term residents that they could approach for an interview. Both short-stay

(intended stay less than 30 days) and long-stay residents were sampled in proportion to their numbers in the facility. Interviews were conducted in the resident's location of choice after the interviewer obtained resident permission to proceed. Of the 16,538 eligible residents, interviews were initiated with 14,381, a response rate of 87%. Completed interviews were obtained from 13,983 residents (97% of initiated interviews were completed). The average number of completed interviews per facility was 36, with a range of 9–65 interviews within each facility (Abrahamson et al., 2012; Vital Research, 2007).

Measures—The 2007 Minnesota Resident QOL and Satisfaction Survey contained 52 items addressing QOL as well as resident satisfaction and mood (Kane et al., 2003). The QOL section of the survey contained 35 items with dichotomous yes/no responses adapted from the Nursing Home QOL Scale, a longer tool developed from a national study of NH residents conducted by Kane et al. (2003). The 35 QOL items represented 10 equally-weighted dimensions based on factor analysis and magnitude estimation by Kane and colleagues (Kane et al., 2003). For the current analysis we created a composite measure of QOL based upon the domains of meaningful activities, autonomy, privacy, relationships, and individuality.

Measures of resident cognitive status, unit placement, and covariates were taken from the MDS 2.0 assessment closest to the date of the survey. The CI level was based on the CPS; Morris et al., 1994), which ranges from 0 (*intact*) to 6 (*very severely impaired*). The SCU placement variable came from item P.1.n (Alzheimer's/Dementia SCU) on the MDS 2.0. Functional level was measured by the ADL Long-Form Scale (Morris, Fries & Morris, 1999), which rates resident self-performance on seven items (bed mobility, transferring, locomotion, dressing, eating, toilet use, and personal hygiene) and ranges from 0 to 28. Other resident-level covariates consisted of clinical conditions and demographic information, selected based upon availability in the data and evidence from previous research indicating a potential relationship between the variable and resident QOL. Resident length of stay (LOS) was calculated from the date of NH admission to the date of the MDS assessment. Facility-level variables were constructed from MDS 2.0 data as well as the 2007 Minnesota Department of Human Services Statistical and Cost Report for Nursing Facilities. We calculated facility staffing levels for different direct care staff types—including nurse administrators, registered nurses(RN) and licensed practical nurses(LPN), nursing and medication aides, mental health workers, social workers, activity/therapeutic recreation staff, and others—by dividing total staff hours from the Statistical and Cost Report by total resident days. We also calculated facility-level clinical quality indicator rates from MDS assessments contemporaneous with the QOL survey and risk-adjusted using key resident characteristics (Arling et al., 2005). Other facility level variables were chain ownership (yes/no), hospital affiliated (yes/no), ownership status (for profit, nonprofit, or government), average resident acuity score (Minnesota Nursing Home Case Mix Index), daily operating costs (average per diem reported cost for NH operations, excluding property). Resident days serve as a proxy for facility size.

Analysis—We used χ^2 tests and two-sample *t*-tests to assess differences in characteristics between facilities with an SCU and those without. Pearson correlations were used to assess

the bivariate association of the QOL score with continuous facility characteristics as well as two-sample *t*-tests for categorical (chain, hospital affiliation, ownership) facility characteristics. To assess the relationship between the facility characteristics and QOL while adjusting for resident characteristics, we use a mixed-effects regression model. Use of a multilevel model was necessary due to the clustered nature of our data resulting in potentially correlated error terms for residents within the same facility. The multilevel model included a random effect for facility to adjust for the potential correlation between residents residing within the same facility and fixed effects for resident level covariates. All analyses were performed using SAS software.

Findings—Resident CPS scores indicated that 18.6% of the sample was cognitively intact, 16.0% borderline impaired, 22.1% mildly impaired, 37.6% moderately impaired, and 5.7% moderately severely impaired. Five percent of the sample resided on a SCU. Differences were noted between nursing facilities that contained a dementia SCU and those which did not. Facilities with a designated SCU had significantly lower QOL scores overall than facilities which did not have an SCU on-site. With regards to staffing, SCU facilities had significantly lower activity staff hours per resident day and significantly higher certified nurse assistant (CNA) hours per resident day. Also, facilities with an SCU were larger in terms of annual resident days than facilities without an SCU and were more likely to be government owned. For QI measures, facilities with an SCU had significantly lower pain, higher restraint use, and higher use of antipsychotics without a diagnosis. Facility-level characteristics of Minnesota NH are displayed in Table 1.

Bivariate associations of resident and facility characteristics with mean facility QOL are presented in Table 2. At the resident level, CI, female, ADL dependency, depression or anxiety, aphasia, hemiplegia and bladder incontinence were related to lower QOL. Longer LOS and age were associated with increased QOL. At the facility-level, activity and CNA staff hours per resident day were significantly associated with higher QOL. Level of acuity, chain ownership, for profit ownership, and total number of resident days were significantly associated with lower QOL; whereas, government ownership and percentage private days were significantly related in higher QOL. Higher rates of incontinence and use of antipsychotics in the facility were significantly associated with lower QOL. Residence on an SCU was not significantly related to QOL at the bivariate level.

Results of the final multivariable, multilevel (resident and facility) model are displayed in Table 3. QOL was negatively related to CI, the presence of psychiatric diagnoses such as depression and anxiety, and ADL dependency. In addition, female gender and increased LOS were associated with increased QOL. Facility factors that were significant and negatively related to resident QOL included total number of resident days. CNA and activity staff hours per resident day were significant and positively related to resident QOL. Unlike in the bivariate results, our multivariable model indicated a positive relationship between QOL and residence on a dementia SCU. The greater severity of CI probably suppressed the relationship between SCU and QOL at the bivariate level. The positive significant effect is likely to have emerged when we controlled for CI and other covariates in the multivariable model. We found that there were no significant interactions between these facility-level variables with CI or residing on an SCU.

Discussion—We found that facility characteristics influenced NH resident QOL while controlling for resident-level covariates. In addition, our prediction that residing on a dementia SCU would exert a positive influence on resident QOL was demonstrated by our model.

Our analysis contributes to the current literature by highlighting that facility characteristics such as staffing levels and performance on clinical quality measures also play an important role in resident perception of QOL. The significant influence of facility staffing levels for CNAs and activity staff highlights the impact of particular direct care providers. Prior studies have found nurse staffing to be related to overall NH quality (Castle & Anderson, 2011; Hyer et al., 2011; Kim, Kovner, Harrington, Greene, & Mezey, 2009; Schnelle et al., 2004) and specifically, some previous studies have found that levels of registered nurse staffing were linked with facility quality (Kim et al., 2009; Castle & Anderson, 2011). Interestingly, in our analysis nursing assistant and not nurse staffing was a significant predictor of resident QOL. CNAs provide the majority of hands-on resident care in NHs, and frequently assist residents with tasks that are deeply personal and strongly connected to individual dignity such as bathing, toileting, dressing, and feeding. The significant association between CNA staffing and QOL suggests that greater availability of these staff for needs ranging from personal care to conversation increases residents' feelings of well-being (Cahill & Diaz-Ponce, 2011).

In comparison with research addressing the influence of nursing staff and quality, little has been written regarding the importance of activity staff members in the daily lives of residents and indeed this variable is not widely measured. Our findings demonstrate that activity staff members play an important role in the experience of NH residents, a role that may be underestimated by MDS-based clinical QIs. Development of QIs that better address resident QOL would benefit from a measure that includes activity-department staffing levels. An interesting finding was that despite lower activity staffing in facilities with SCUs versus without, residents of SCUs reported higher QOL, suggesting that CNAs may be largely fulfilling this important need in these settings. Further investigation is needed to examine how the finding that smaller facilities have higher QOL scores may relate to issues of staff composition (nursing vs. ancillary departments) and delegation of tasks related to meaningful activity. Interesting and important differences in work processes and patterns of interaction may exist between large and small facilities that were under-identified by our use of solely quantitative methods. Future research would benefit from a more in-depth qualitative examination of the relationships between staffing, activity offerings, facility size, and resident QOL.

These findings also support the concept of SCU design; the specialized physical and social environments of these units are meant to address individualized resident needs, specifically focusing upon residents with cognitive or behavioral difficulties (Gruneir et al., 2008; Holmes et al., 1990). Examples of modifications found on many SCUs that could potentially increase resident QOL include specialized staff training, noise reduction programs, frequent use of private rooms, smaller unit sizes, increased availability of natural light, and flexible resident routines (Day, Carreon, & Stump, 2000; Holmes et al., 1990). Interestingly, although residing on an SCU was a significant predictor of individual-level QOL, presence

of a SCU within a facility was not a predictor of overall resident QOL. Further investigation is needed to assess within facility allocation of resources such as staff, equipment, and activities programming to determine if the presence of an SCU detracts from the experience of residents in an SCU facility with traditional unit placement.

Individual characteristics play an important role in QOL. Greater CI, ADL dependency, incontinence, psychiatric diagnoses, and conditions related to communication and functioning (aphasia and hemiplegia) were related to lower self-reported QOL; and residing for a longer period of time in the facility was related to higher QOL. Evaluation of QOL among cognitively impaired NH residents poses particular challenges given the potential for difficulties with communication, memory, and cognitive processing within this population. However, previous investigations have found that NH residents are reliable informants of their own QOL status, even in cases of CI (Brod, Steward, Sands, & Walton, 1999; Kane et al., 2003; Logsdon et al., 2002; Maslow & Heck, 2005; Mozley et al., 1999). Our analysis is unique in the use of valid, self-report QOL data from NH residents representing a range of CI levels. However, a limitation of this method is the inability to assess QOL among highly cognitively impaired NH residents. Also, data for analyses came from naturally occurring settings, and residents were not randomly assigned to SCU environments. Resident differences between SCU and non-SCU environments were controlled for through the inclusion of resident-level variables, yet these differences are a limitation to our findings. In addition, while our sample represents the population of NH residents in the state of Minnesota, results may not be generalizable to a national population of residents.

Though key facility characteristics such as primary reimbursement source, ownership type, and licensed nurse staffing were not predictive of resident QOL, we discovered that more interpersonal factors were salient: smaller facilities, facilities that avoid important negative clinical outcomes (high-pressure ulcer and incontinence rates), and facilities that were adequately staffed with nursing assistant and activity staff had higher resident QOL. It is commonly assumed that living in a residential long-term care institution such as a NH may have a negative influence on an individual's QOL. Our analysis examined organizational factors that may buffer or counteract the negative influence of institutionalization on resident QOL. Characteristics such as ownership and reimbursement rate may have indirect effects but they are probably distant to the everyday resident experience. Licensed staff may play a role, yet it is CNAs and activity staff who spend the most time and develop personal relationships with residents. Our results indicate that quality measures which address direct care staffing and activity programming, such as is frequently found on SCU, may be particularly salient in assessing the ability of a NH to address resident QOL, and interventions designed to improve QOL would benefit from an interpersonal focus.

Acknowledgments

Funding

The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This study was supported by an Investigator Initiated Research Grant (#07-59504) from the Alzheimer's Association. This work was also supported by National Institute on Aging grant P30 AG024967.

References

- Abrahamson K, Clark D, Perkins A, Arling G. Does cognitive impairment influence quality of life among nursing home residents? *The Gerontologist*. 2012; 52(5):632–640. [PubMed: 22230491]
- Andersen CK, Witttrup-Jensen KU, Lolk A, Andersen K, Kragh-Sorensen P. Ability to perform activities of daily living is the main factor affecting quality of life in patients with dementia. *Health and Quality of Life Outcomes*. 2004; 2:52.10.1186/1477-7525-2-52 [PubMed: 15383148]
- Arling G, Kane RL, Lewis T, Mueller C. Further development of nursing home quality indicators. *The Gerontologist*. 2005; 45(2):147–156. [PubMed: 15799979]
- Brod M, Stewart AL, Sands L, Walton P. Conceptualization and measurement of quality of life in dementia: the dementia quality of life instrument (DQoL). *Gerontologist*. 1999; 39(1):25–35. [PubMed: 10028768]
- Cahill S, Diaz-Ponce AM. I hate having nobody here. I'd like to know where they all are": Can qualitative research detect differences in quality of life among nursing home residents with different levels of cognitive impairment? *Aging & Mental Health*. 2011; 15:562–572. [PubMed: 21815848]
- Castle NG, Anderson R. Caregiver staffing in nursing homes and their influence on quality of care. *Medical Care*. 2011; 49:545–552. [PubMed: 21577182]
- Castle NG, Ferguson JC. What is nursing home quality and how is it measured? *Gerontologist*. 2010; 50:426–452. [PubMed: 20631035]
- Day K, Carreon D, Stump C. The therapeutic design of environments for people with dementia: A review of the empirical research. *Gerontologist*. 2000; 40:397–414. [PubMed: 10961029]
- Degenholtz HB, Kane RA, Kane RL, Bershadsky B, King KC. Predicting nursing facility residents' quality of life using external indicators. *Health Services Research*. 2006; 41:335–357.10.1111/j.1475-6773.2005.00494.x [PubMed: 16584452]
- Drageset J, Nygaard HA, Eide GE, Bondevik M, Nortvedt MW, Natvig GK. Sense of coherence as a resource in relation to health-related quality of life among mentally intact nursing home residents—a questionnaire study. *Health and Quality of Life Outcomes*. 2008; 6(85):1–9.10.1186/1477-7525-6-85 [PubMed: 18179687]
- Gruneir A, Lapane KL, Miller SC, Mor V. Are special care units really special? A new look at an old question. *Journal of the American Geriatrics Society*. 2008; 56(2):199–205.10.1111/j.1532-5415.2007.01559.x [PubMed: 18179483]
- Hoe J, Hancock G, Livingston G, Woods B, Challis D, Orrell M. Changes in the quality of life of people with dementia living in care homes. *Alzheimer Disease and Associated Disorders*. 2009; 23(3):285–290.10.1097/WAD.0b013e318194fc1e [PubMed: 19812472]
- Holmes D, Teresi J, Weiner A, Monaco C, Ronch J, Vickers R. Impacts associated with special care units in long-term care facilities. *Gerontologist*. 1990; 30(2):178–183.10.1093/geront/30.2.178 [PubMed: 2189792]
- Hyer K, Thomas KS, Branch LG, Harman JS, Johnson CE, Weech-Maldonado R. The Influence of Nurse Staffing Levels on Quality of Care in Nursing Homes. *Gerontologist*. 2011; 51:610–616. [PubMed: 21602292]
- Kane RA. Long-term care and a good quality of life: Bringing them closer together. *Gerontologist*. 2001; 41(3):293–304.10.1093/geront/41.3.293 [PubMed: 11405425]
- Kane RA, Kling KC, Bershadsky B, Kane RL, Giles K, Degenholtz HB, Cutler LJ. Quality of life measures for nursing home residents. *Journal of Gerontology: Medical Sciences*. 2003; 58A(3):240–248.10.1093/Gerona/58.3.M240
- Kane RL, Bershadsky B, Kane RA, Degenholtz HH, Liu J, Giles K, Kling KC. Using resident reports of quality of life to distinguish among nursing homes. *Gerontologist*. 2004; 44(5):624–632.10.1093/geront/44.5.624 [PubMed: 15498838]
- Kim H, Kovner C, Harrington C, Greene W, Mezey M. A panel data analysis of the relationships of nursing home staffing levels and standards to regulatory deficiencies. *Journals of Gerontology: Psychological Sciences*. 2009; 64B(2):269–278.
- Logsdon RG, Gibbons LE, McCurry SM, Teri L. Assessing quality of life in older adults with cognitive impairment. *Psychosomatic Medicine*. 2002; 64:510–519. [PubMed: 12021425]

- Maslow K, Heck E. Dementia care and quality of life in assisted living and nursing homes: perspectives of the Alzheimer's association. *Gerontologist*. 2005; 45(Special Issue 1):8–10. [PubMed: 16230744]
- Morris JN, Fries BE, Mehr DR, Hawes C, Phillips C, Mor V, Lipsitz LA. MDS Cognitive Performance Scale. *Journal of Gerontology: Medical Sciences*. 1994; 49(4):M174–M182.
- Morris JN, Fries BE, Morris SA. Scaling ADL's within the MDS. *Journal of Gerontology: Medical Sciences*. 1999; 54A(11):M546–M553.
- Mozley CG, Huxley P, Sutcliffe C, Bagley H, Burns A, Challis D, Cordingley L. Not knowing where I am doesn't mean I don't know what I like: cognitive impairment and quality of life responses in elderly people. *International Journal of Geriatric Psychiatry*. 1999; 14:776–783. [PubMed: 10479750]
- Schnelle JF, Simmons SF, Harrington C, Cadogan M, Garcia E, Bates-Jensen B. Relationship of nursing home staffing to quality of care. *Health Services Research*. 2004; 39:225–250. [PubMed: 15032952]
- Selwood A, Thorgrimsen L, Orrell M. Quality of life in dementia-a one-year follow-up study. *International Journal of Geriatric Psychiatry*. 2005; 20:232–237.10.1002/gps.1271 [PubMed: 15717339]
- Sloane PD, Zimmerman S, Williams CS, Reed PS, Gill KS, Preisser JS. Evaluating the quality of life of long-term care residents with dementia. *Gerontologist*. 2005; 45(Special Issue 1):37–49. [PubMed: 16230748]
- Vital Research LLC. Implementation of the 2007 Consumer Satisfaction and Quality of Life Survey in Minnesota Nursing Homes: Final Report to the Minnesota Department of Human Services. Los Angeles, CA: Author; 2007.
- Zimmerman S, Sloane PD, Williams CS, Reed PS, Preisser JS, Eckert JK, Dobbs D. Dementia care and quality of life in assisted living and nursing homes. *Gerontologist*. 2005; 45(Special Issue 1): 133–146.10.1093/geront/45.suppl_1.133 [PubMed: 16230760]

Table 1

Characteristics of Minnesota Nursing Facilities Overall and by Presence or Absence of a Dementia Special Care Unit (SCU).

	<u>Overall (n = 388)</u>	<u>No SCU (n = 270)</u>	<u>SCU (n = 118)</u>	
	Mean (SD) or %	Mean (SD) or %	Mean (SD) or %	p-value
Quality of life score	80.2 (4.9)	80.6 (4.7)	79.2 (5.0)	0.010
Facility characteristics				
% Chain	47.3%	44.2%	54.2%	0.068
% Hospital affiliated	14.7%	16.7%	10.2%	0.094
Ownership				
% For-profit owned	30.5%	31.2%	28.8%	0.635
% Nonprofit owned	10.6%	14.1%	2.5%	0.001
% Government owned	58.9%	54.7%	68.6%	0.010
Facility staffing				
Activity hours/day	0.23 (0.08)	0.24 (0.09)	0.22 (0.08)	0.045
CNA hours/day	2.28 (0.44)	2.24 (0.47)	2.39 (0.36)	0.002
LPN hours/day	0.73 (0.21)	0.73 (0.22)	0.75 (0.18)	0.359
RN hours/day	0.34 (0.27)	0.34 (0.31)	0.33 (0.14)	0.876
Facility case mix				
Average resident acuity score	1.02 (0.09)	1.02 (0.10)	1.02 (0.08)	0.703
Daily operating cost	175.8 (47.2)	174.7 (53.0)	178.3 (30.4)	0.483
Occupancy	0.95 (0.08)	0.94 (0.08)	0.95 (0.08)	0.232
Resident days	29,823 (18735)	23,738 (11250)	43,490 (24252)	<0.001
Medicaid days	17,636 (11565)	13,959 (7142)	25,894 (14906)	<0.001
Medicare days	2,493 (2,271)	2,011 (1,727)	3,576 (2,898)	<0.001
Private pay days	7,825 (6053)	6,168 (3916)	11,546 (8052)	<0.001
Facility clinical quality indicators				
Incidence of ADL decline	15.4 (5.6)	15.1 (5.8)	16.1 (4.9)	0.103
Prevalence of moderate to severe pain	18.2 (10.7)	19.0 (11.0)	16.4 (9.9)	0.030
Prevalence of restraints	2.9 (3.7)	2.6 (3.6)	3.6 (4.0)	0.021
Incidence of worsening bladder continence	45.3 (25.6)	44.1 (25.9)	47.8 (24.7)	0.192
Antipsychotics w/o a supporting DX	16.0 (10.2)	14.9 (10.3)	18.5 (9.5)	0.001
New pressure sores	5.2 (2.8)	5.2 (2.9)	5.4 (2.5)	0.409

Note. ADL = activities of daily living.

Table 2

Bivariate Relationships between Resident and Facility Characteristics and Resident QOL Score.

	Parameter estimate (SE)	p-value
Resident level		
CPS		<0.001
4,5	−6.32 (0.76)	
3	−5.22 (0.46)	
2	−3.75 (0.50)	
1	−3.34 (0.55)	
0 (reference)		
Resides on SCU	0.67 (0.75)	0.370
Female	1.81 (0.35)	<0.001
Age	0.03 (0.01)	0.033
ADL score	−0.26 (0.02)	<0.001
LOS		<0.001
1 Year+	3.30 (0.63)	
6 months to 1 year	2.87 (0.74)	
30 days to 6 months	1.66 (0.71)	
< 30 days (reference)		
Arthritis	0.48 (0.33)	0.145
Cancer	−0.73 (0.57)	0.197
Aphasia	−6.02 (0.93)	<0.001
Hemiplegia	−2.93 (0.55)	<0.001
Depression	−1.94 (0.32)	<0.001
Schizophrenia	−1.43 (0.77)	0.062
Bipolar disorder	−1.87 (0.98)	0.057
Anxiety	−1.30 (0.41)	0.001
Mod/severe pain	−0.61 (0.42)	0.147
Any bladder incontinence	−2.07 (0.33)	<0.001
Facility level		
Staffing		
Activity hr/day	18.06 (2.78)	<0.001
CNA hr/day	1.44 (0.57)	0.012
LPN hr/day	−0.68 (1.19)	0.568
RN hr/day	−1.34 (1.10)	0.224
Average resident acuity score	−10.09 (2.74)	<0.001
Chain	−1.41 (0.49)	<0.001
Daily operating cost	−0.01 (0.006)	0.094
For-profit owner	−1.61 (0.53)	0.003
Nonprofit owner	0.75 (0.50)	0.133
Government owner	1.71 (0.81)	0.035
Occupancy	4.36 (3.07)	0.156

	Parameter estimate (SE)	p-value
Resident days	−2.40 (0.45)	<0.001
% Medicaid days	−0.004 (0.02)	0.840
% Medicare days	−0.06 (0.04)	0.108
% Private days	0.05 (0.02)	0.016
Clinical quality indicators		
ADLs	−0.049 (0.045)	0.272
Pain	−0.01 (0.023)	0.717
Restraints	−0.06 (0.067)	0.382
Continence	−0.029 (0.01)	0.003
Antipsychotics w/o DX	−0.084 (0.02)	0.001
New pressure sores	−0.16 (0.09)	0.074

Note. CPS = Cognitive Performance Scale. SCU = special care unit. ADL = activities of daily living. LOS = length of stay. CNA = certified nurse assistant. LPN = licensed practical nurses. RN = registered nurses. ADL = activities of daily living.

Table 3

Multiple Regression Model for Influence of Resident and Facility Characteristics on Resident QOL.

	Parameter estimate (SE)	p-value
Resident level		
CPS (overall $p < 0.001$)		
4	-4.53 (0.83)	<0.001
3	-4.77 (0.50)	<0.001
2	-3.68 (0.52)	<0.001
1	-3.20 (0.56)	<0.001
0 (intact; reference)		
Resides on SCU	2.00 (0.79)	0.011
Female	1.74 (0.37)	<0.001
Age	-0.01 (0.02)	0.529
ADL score	-0.20 (0.03)	<0.001
LOS		
1 Year +	4.65 (0.69)	<0.001
6 months to 1 year	3.68 (0.77)	<0.001
30 days to 6 months	2.34 (0.74)	0.001
< 30 days (reference)		
Arthritis	0.19 (0.35)	0.580
Cancer	-0.42 (0.58)	0.472
Aphasia	-4.03 (1.01)	<0.001
Hemiplegia	-1.04 (0.60)	0.086
Depression	-1.56 (0.34)	<0.001
Schizophrenia	-2.24 (0.90)	0.013
Bipolar	-2.80 (1.08)	0.009
Anxiety	-1.39 (0.43)	0.001
Moderate/severe pain	-0.50 (0.44)	0.260
Any bladder incontinence	-0.26 (0.38)	0.495
Facility level		
Has an SCU	-0.04 (0.61)	0.953
Activity hr/day	9.03 (3.17)	0.005
CNA hr/day	1.97 (0.74)	0.008
LPN hr/day	0.90 (1.26)	0.478
RN hr/day	1.95 (1.82)	0.285
Acuity score	2.70 (4.52)	0.552
Occupancy	1.64 (3.52)	0.642
Daily operating cost	-0.01 (0.01)	0.129
Chain	-0.71 (0.47)	0.135
Ownership type		
Nonprofit owned	0.77 (0.61)	0.206
Government owned	0.31 (0.92)	0.736

	Parameter estimate (SE)	p-value
For Profit owned (reference)		
Number of resident days	-1.85 (0.59)	0.002
% Medicaid days	0.08 (0.07)	0.278
% Medicare days	0.11 (0.09)	0.230
% Private days	0.07 (0.07)	0.289
ADL QI	-0.04 (0.05)	0.429
Pain QI	0.0002 (0.02)	0.994
Restraints QI	0.04 (0.06)	0.577
Bladder continence QI	-0.01 (0.01)	0.286
Antipsychotics QI	-0.04 (0.03)	0.164
Pressure ulcers QI	-0.16 (0.09)	0.082

Note. CPS = Cognitive Performance Scale. SCU = special care unit. ADL = activities of daily living. LOS = length of stay. CNA = certified nurse assistant. LPN = licensed practical nurses. RN = registered nurses. QI = quality indicators