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Director of Nursing Current Job Tenure and Past Experience and Quality of Care in Nursing Homes

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Abstract

Background—Directors of nursing (DON) are central to quality of care in nursing homes (NH) because of their role in coordinating and overseeing nursing care. Research is needed to test the association between DON characteristics and quality using large, representative samples of NHs and global measures of quality. One such measure is the quality measure (QM) rating from the Centers for Medicare & Medicaid Services' Five-Star Quality Rating, which aggregates 10 individual QMs into a single rating.

Purpose—This study examined whether DON current job tenure or past experience (1) differed across levels of the QM rating, (2) was associated with QM ratings, and (3) was associated with any of the individual 10 QM scores that comprise QM ratings.

Methodology—Data for a nationally representative sample of 1,174 NHs were obtained from the 2004 National Nursing Home Survey, publicly-reported QMs, and an Area Resource File. Wald tests were used to test differences in mean DON current job tenure and past experience across levels of the QM rating. Multinomial logistic and Poisson regression analyses were used to examine the association between DON current job tenure and past experience and QM ratings and QM scores, respectively, controlling for selected market and organizational characteristics.

Findings—NHs with longer DON current job tenure tended to have higher QM ratings. Longer DON current job tenure was associated with higher QM ratings and lower QM scores for several individual QMs, suggesting higher quality. DON past experience did not differ across levels of the QM rating and was neither associated with QM ratings or QM scores.

Practice Implications—This study highlights the need for owners and administrators to support DONs as they either transition into the role of the DON for the first time or learn to effectively fulfill their role in a new NH.

Keywords

nursing home; nursing administration; quality of care; quality of health care

Nursing home top management teams, which includes the nursing home (NH) administrator, director of nursing (DON), and medical director, can have an important role in influencing quality in NHs. That is, top managers are responsible for overall oversight of NH care delivery (Centers for Medicare & Medicaid Services, 2011). Even though DONs do not typically provide direct resident care, DONs may be particularly central to quality of care because of their role in coordinating, executing, and overseeing nursing care (Olson &

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Zwygart-Stauffacher, 2008; Siegel, Mueller, Anderson, & Dellefield, 2010). A small body of research has linked top manager characteristics, such as turnover and tenure, and management practices, including communication style and approach to decision-making, to quality of care in NHs (Krause, 2010). However, few studies have empirically tested the influence of DON characteristics on quality of care (Krause, 2010). Furthermore, policy initiatives to improve NH care, such as regulatory reform, quality report cards, and national campaigns, have generally ignored the importance of DONs for facilitating improvements in quality (Siegel et al., 2010).

Review of the Literature and Conceptual Framework

Two DON characteristics that existing exploratory studies using small, non-representative samples repeatedly found to be associated with quality of care were current job tenure, which refers to the length of time in the role of DON at a specific NH, and career experience, which refers to the length of time in the role of DON at any NH. Specifically, the studies documented that longer DON current job tenure was associated with lower rates of restraint use (Anderson, Issel, & McDaniel, 2003); lower quality indicator scores, which suggests higher quality of care (Rantz et al., 2003; Rantz et al., 2004); and higher resident satisfaction (Kruzich, Clinton, & Kelber, 1992). One of these studies found that longer DON career experience was associated with lower rates of restraint use and complications of immobility (Anderson et al., 2003). These studies provided insight into the importance of DONs for quality of care, despite the paucity of readily available data on DON characteristics. Due to this lack of data, it was necessary for many of the researchers to collect primary data about DONs, which can be costly and time consuming (Beuscher & Grando, 2009; Buckwalter et al., 2009; Maas, Kelley, Park, & Specht, 2002), making it difficult to obtain large, representative samples of NHs.

Longer DON career experience and current job tenure may be linked to higher quality of care because of the “learning curve” when transitioning into the DON role, in general, and when transitioning into the DON role at each unique NH, in particular (Castle, 2001; Castle & Lin, 2010). Over time, DONs may develop an intuitive grasp of their role and greater knowledge, skills, and abilities for overcoming managerial challenges than a DON with no experience. This is consistent with Benner’s Stages of Clinical Competence which suggests that, with experience, a nurse transitions from novice, meaning that the nurse has no practical experience and must base actions on principles and rules, to expert, meaning that the nurse has an intuitive grasp based on extensive experience that can serve as the basis for effectively overcoming new challenges (Benner, 1984). However, even DONs with past experience may experience challenges as they transition into the role of the DON at each unique NH, which may explain why existing studies have found an association between longer DON current job tenure and higher quality of care. Although existing research has studied the impact of career experience, which is the sum of current job tenure and past experience, on quality of care, no research to date has separated the influence of current job tenure from that of past experience. Such research is needed to provide an understanding of the unique contribution of how much time a DON has worked in a given NH (current job tenure) and the knowledge and skills the DON may have brought to the position as a result of time spent in the DON role at other NHs (past experience).

Additional research that builds on existing studies by using a large, representative sample of NHs and utilizes an expanded number of measures of quality of care is needed to inform future policy initiatives and to support future intervention research. Using a large, representative sample of NHs will ensure that the study is adequately powered to detect small effects and will allow conclusions to be drawn about the extent to which the documented linkages between DONs and quality of care would likely be true in the larger

population of NHs. By utilizing an expanded number of measures of quality of care, future research would generate knowledge about the types of outcomes that may be influenced by DONs. The Centers for Medicare & Medicaid Services' (CMS) recently released the new Five-Star Quality Rating System (Five-Star), which assigns NHs ratings of between one star and five stars, with five stars being the highest for the following four categories or domains: staffing levels, certification survey findings, quality measures (QM), and overall quality (CMS, 2010). No research published to date has utilized any of the Five-Star domain ratings as a measure of quality of care. The QM domain of Five-Star—referred to as the QM rating—provides a global "snapshot" of quality because it aggregates three quarters of data from 10 individual QMs into a single rating. Therefore, one opportunity for responding to the need for research that utilizes an expanded number of measures of quality would be to utilize both global measures of quality of care, such as the QM rating, and more specific measures of quality, such as the individual QMs that comprise the QM rating. The purposes of this study were to build on existing research by utilizing a large, nationally representative sample of NHs to examine: (1) whether DON current job tenure or past experience differed across levels of the QM rating, (2) whether DON current job tenure or past experience are associated with the QM rating, and (3) whether DON current job tenure or past experience are associated with any of the 10 individual QM scores that comprise the QM rating.

Method

Data Sources

Data for this study were obtained from three sources: 2004 National Nursing Home Survey (NNHS), CMS' QMs for NHs, and an Area Resource File (Bureau of Health Professions, 2008). Data on DON characteristics (current job tenure and past experience) and organizational characteristics were obtained from the 2004 NNHS. The QM ratings were calculated using CMS' publicly reported QMs from the third and fourth quarter of 2004 and first quarter of 2005. County-level market characteristics were obtained from the ARF. This study was determined to be exempt from review by the University of Wisconsin-Madison Institutional Review Board.

2004 National Nursing Home Survey

The 2004 NNHS is a nationally representative survey of 1,174 NHs (response rate =81%) administered by the National Center for Health Statistics between August 2004 and January 2005 (http://www.cdc.gov/nchs/nnhs.htm). These NHs had at least three beds and were certified by Medicare or Medicaid or had a state license to operate. The 2004 NNHS included questions related to top management characteristics and organizational characteristics. The questions pertaining to DON characteristics were answered through a self-administered questionnaire by the NH Administrator or a designee. The questions pertaining to organizational characteristics were completed through an in-person, computer-assisted interview with the administrator.

Center for Medicare & Medicaid Services' Publicly Reported QMs

Three quarter averages, corresponding to the data collection period for the 2004 NNHS, of CMS' publicly-reported QMs were obtained for this study. Specifically, QM data for the third and fourth quarter of 2004 and first quarter of 2005 were used for this study. The QMs are a set of 19 measures derived from resident assessment data that address a range of functioning and health status areas, such as restraint use and mobility decline, reflecting the multidimensional nature of care quality in NHs. Higher values for QMs indicate that a larger percentage of residents are experiencing potentially poor care practices or outcomes (Zimmermann et al., 1995), which suggests lower quality. Some of the QMs are risk-adjusted using resident-level covariates to control for differences in NH resident

characteristics that could result in artificially low QM scores for NHs caring for medically complex residents. The QMs can be categorized according to the type of resident included in the QM calculation or whether the QM captures activities of daily living (ADL). In terms of type of resident, QMs can be categorized as long-stay or short-stay measures. Long-stay measures are calculated for those types of residents who tend to remain in the NH for several months or years. Short-stay measures are calculated for those types of residents who typically stay in NHs for less than 30 days. Currently, there are 14 long-stay and 5 short-stay measures. The ADL QMs capture basic elements of functioning, such as a change in ability to transfer, eat, and dress independently, whereas the other QMs capture aspects that do not directly reflect functioning, such as the incidence of residents with urinary tract infections or pressure ulcers. Currently, there are 2 ADL and 17 other QMs.

Area Resource File

The ARF is a compilation of data aggregated to the county level from various sources, including the United States Census of Population and Housing, Bureau of Labor Statistics, and CMS. The ARF contains data pertaining to NH market characteristics, including the number of NHs per county and county-level unemployment rates.

Measures

Director of Nursing Characteristics

Data on DON characteristics were obtained through a series of questions about the DON. Data on two such characteristics--current job tenure and past experience—are included in this study. Current job tenure was the number of years that a DON was employed in that role at the respective NH. Past experience was calculated as the DON's overall experience, in years, in that role at any NH, less current job tenure.

Quality Measure Ratings

Quality measure ratings were calculated for all United States NHs certified to participate in Medicare or Medicaid using the specifications described in the Design for Nursing Home Compare Five-Star Quality Rating System: Technical Users' Guide (Centers for Medicare and Medicaid Services, 2010). Each NH was assigned a QM rating based on their performance over 3 quarters for a subset of 10 CMS QMs (see Table 1). These QMs were selected by the project's technical expert panel (TEP) based on a range of criteria, including the measures' validity and reliability, the extent to which the measure is under the facility's control, statistical performance, and clinical importance (Centers for Medicare and Medicaid Services, 2010). Based on input from the TEP regarding the greater importance of ADL measures for NH residents, performance on the ADL measures is weighted 1.6667 times that on the non-ADL measures. As a result, the 2 ADL measures count for 40% of the overall weight on the long-stay measures.

To calculate QM ratings, NHs were first assigned points based on how they compared to other NHs in the country for non-ADL QMs and other NHs in their state for ADL QMs (see table 2). Each NHs final score was the sum of the points awarded for each QM, where higher numbers of points corresponded to lower QM scores, suggesting higher quality. Points assigned for the 10 QMs are summed to yield a total score. The strategy used for missing data imputation varied based on the pattern of missing data. For NHs with data for at least 4 of 7 long-stay QMs, the statewide average for the long-stay QM was imputed. For facilities with data for 2 of 3 short-stay QMs, the statewide average for the short-stay QM was imputed. For NHs with fewer than 4 long-stay QMs and/or fewer than 2 short-stay QMs, no missing data were imputed. Points were rescaled so that NHs with only long-stay or short-stay QMs had the same maximum possible score as NHs with both types of QMs.

Each NH was then assigned a QM rating based on how its total score compared to that for other NHs in the country. Specifically, NHs were assigned QM ratings in the following manner: less than the 20th percentile, one star; equal to or greater than the 20th percentile, but lower than the 43.33rd percentile, two stars; greater than or equal to the 43.33rd percentile, but lower than the 66.67th percentile, three stars; greater than or equal to 66.67th percentile, but lower than the 90th percentile, four stars; and greater than or equal to 90th percentile, five stars. No ratings were assigned to NHs with fewer than four long-stay and fewer than two short-stay QMs.

Individual QM Scores

Three quarter averages of QM scores were obtained for the subset of10 QMs that were used to calculate the QM ratings. The QM scores could range from 0 to 100, where 0 indicates that none and 100 indicates that all of the residents experienced the potentially poor care processes or outcomes. Therefore, a QM score at or near to zero is interpreted as suggesting higher quality, whereas a higher QM score indicates lower quality. Three-quarter averages were censored if they were calculated for an average of fewer than 30 residents for long-stay measures or fewer than 20 residents for short-stay measures.

Control Variables

Nursing home organizational characteristics—Data on selected organizational characteristics that research has suggested to be associated with quality of care—ownership, chain membership, facility size, occupancy, and Medicaid census—were included in this study (Castle & Engberg, 2008; Decker & Castle, in press; Dellefield, 2006). Organizational size was measured as the number of beds in the NH and was dichotomized into (0) less than 100 beds and (1) greater than or equal to 100 beds. Occupancy was measured as the percentage of the NH beds that were in use by a resident and was categorized as low, less than 70%; moderate, between 70 and 79%; or high, at least 80%. Medicaid census was measured as the percentage of residents whose primary source of payment was Medicaid and was categorized for this study as low, less than 60%; moderate, between 60 and 79%; and high, at least 80%. Ownership was measured as one of seven options, including for-profit, private nonprofit, and state/local government, that best described the NH and was dichotomized as (0) not for profit, including government and private nonprofit, or (1) for profit. Chain membership was measured as whether the NH did or did not belong to chain and was dichotomized as (0) not a member of a chain or (1) member of a chain.

County-level market characteristics—Two market characteristics that previous research has suggested to be associated with quality of care—market competition and unemployment rates—were included in this study (Carter & Porell, 2003; Castle, Liu, & Engberg, 2008; Decker & Castle, in press). Market competition, measured as the inverse of the number of nursing homes in the country, is believed to affect quality of care by creating greater market competition (Decker & Castle, in press). Unemployment rate, measured as the percentage of people in the county that were unemployed, may affect quality of care, since local economic conditions can influence the ability of NHs to provide high quality care (Castle & Engberg, 2008).

Procedure

To create the analytic file, QM ratings for all U.S. NHs, county-level market characteristics, DON characteristics, and organizational characteristics that could be calculated using publicly available 2004 NNHS data were provided to the Research Data Center (RDC) at the National Center for Health Statistics. The RDC staff then merged that data with restricted 2004 NNHS data and subsequently dropped identifiers and data for NHs that did not

participate in the 2004 NNHS. Because this study involved no identifiable patient data, it was determined to be exempt from review by the University of Wisconsin-Madison Institutional Review Board.

This study included 1,012 of the 1,174 NHs surveyed for the 2004 NNHS, approximately 86% of the sample. Forty-two NHs were omitted because they could not be linked with the file containing QM ratings. Another 120 NHs were omitted because they had missing data for study variables. All analysis was conducted using procedures in STATA developed for analysis of complex survey data (StataCorp, 2009). Descriptive statistics were calculated for all study variables. Tolerance and variance inflation factors were examined to assess multicollinearity.

First Research Aim—To examine whether DON current job tenure and career experience differed across levels of the QM rating, mean current job tenure and career experience were calculated for each level of the QM rating. Next, pairwise comparisons were tested to determine if mean current job tenure or past experience differed across levels of the QM rating. The Holm (1979) sequentially rejective multiple test procedure was used to control Type I error rate across those comparisons.

Second Research Aim—Multinomial logistic regression analysis was used to examine the association between DON current job tenure and past experience and QM ratings, controlling for market competition, unemployment rate, ownership, chain membership, organizational size, occupancy, and Medicaid census. Relative risk ratios and linearized standard errors were calculated for each predictor for NHs with two stars, three stars, four stars, and five stars, compared to NHs with one star. For categorical predictors, for NHs for which the predictor was coded one, relative risk ratios greater than (less than) 1.0 indicated an increased (decreased) relative risk of a NH having a given numbers of stars compared to the risk of having one star. For continuous predictors, for every unit change in the predictor, relative risk ratios greater than (less than) 1.0 indicated an increased (decreased) relative risk of having a given number of stars compared to the risk of having one star.

Third Research Aim—Poisson regression analysis was used to examine the association between DON current job tenure and career experience and scores for each of the 10 QMs that comprise the QM rating, controlling for market competition, unemployment rate, ownership, chain membership, organizational size, occupancy, and Medicaid census. A Poisson distribution, not a negative binomial distribution, was used because the likelihood ratio test of the over-dispersion parameter alpha was not significantly different than zero. In general, ordinary Poisson regression was used, although the zero-inflated model was used to model pain and short-stay pressure ulcers because the Vuong test indicated that the zero-inflated model was superior for those QMs (Vuong, 1989). A significant z-test indicated that that the zero-inflated model was superior for pain and short-stay pressure ulcers. Incidence rate ratios and linearized standard errors were calculated for each QM. For categorical predictors, incident rate ratios greater than (less than) 1.0 were interpreted as indicating an increase (decrease) in the rate of the potentially problematic care process or outcome for NHs for which the predictor is coded one. For continuous predictors, incident rate ratios greater than (less than) 1.0 were interpreted as indicating an increase (decrease) in the rate of the potentially problematic care process or outcome for each unit change in the predictor.

Findings

Descriptive statistics for all study variables are reported in Table 1. The sample of NHs in this study was comparable to the overall population of NHs in terms of the percentage of NHs in each level of the QM rating, though comparability was difficult to assess in terms of

DON current job tenure and past experience. Based on the methodology for the QM rating, approximately 20% of NHs will have one star, 23.33% will have two stars, 23.33% will have three stars, 23.33% will have four stars, and 10% will have five stars. The sample differed minimally from the population, with approximately 19% having one star, 23% having two stars, 25% having three stars, 23% having four stars, and 10% having five stars. It is difficult to determine the extent to which DON current job tenure and past experience are comparable to the overall population of NHs since, aside from the NNHS, national data on these characteristics is not available. Mean DON current job tenure in this sample was 3.3 years, which is slightly higher than the 2.7 years reported for a sample of 164 DONs in Texas (Anderson et al., 2003), but markedly lower than the 7.49 years reported for a sample of 51 NHs in Wisconsin (Kruzich et al., 1992). Mean DON past experience in this sample was 3.38 years, which is comparable to the 3.15 years for a sample of 164 DONs in Texas (Anderson et al., 2003). The variance inflation factors for each variable were low, so multicollinearity was not suspected.

First Research Aim

Mean DON current job tenure and past experience for each level of the QM rating are reported in Table 2. Wald tests indicated that four and five star NHs had significantly higher DON current job tenure than one star NHs. There were no statistically significant differences in DON past experience for NHs with different QM ratings.

Second Research Aim

Results from the multinomial logistic regression analysis of the association between DON current job tenure and past experience and QM ratings are reported in Table 3. For parsimony, only results pertaining to DON characteristics are described here. For every year increase in DON current job tenure, NHs were 5% more likely to have four stars and 10% more likely to have five stars than one star. DON past experience was not associated with QM ratings.

Third Research Aim

The results of the Poisson regression analyses examining the association between DON current job tenure and past experience and the 10 QM scores that comprise the QM rating, controlling for selected market and organizational characteristics, are reported in Table 4. For parsimony, only the results pertaining to DON current job tenure and past experience are described here. Longer DON current job tenure was associated with lower QM scores, suggesting higher quality of care, for five QMs. Specifically, for every year increase in DON current job tenure, there was a 1% decrease in the rate of late loss activity of daily living (ADL) decline, pain, mobility decline, and urinary tract infections and a 2% decrease in the rate of short-stay delirium. DON past career experience was not associated with QM scores.

Discussion

This study adds to the body of research linking DONs to quality of care in NHs by using a nationally representative sample of NHs to demonstrate that longer DON current job tenure, but not past career experience, was associated with higher quality of care. The finding that longer DON current job tenure was associated with higher quality of care was consistent with the findings from other existing, exploratory research (Anderson et al., 2003; Kruzich et al., 1992; Rantz et al., 2003; Rantz et al., 2004). One possible explanation for the finding that DON current job tenure, but not past experience, is associated with quality of care is that there may be a “learning curve” that is unique to individual NHs and that past experience in other NHs may have little bearing on current performance. Specifically, lessons learned for effectively coordinating, executing, and overseeing nursing care in one

NH may be minimally applicable within another NH. This raises questions about the extent to which the association between longer DON career experience—the sum of current job tenure and past experience—and higher quality of care that was documented by past research could have been largely explained by longer current job tenure, rather than overall career experience.

The association between longer DON current job tenure and higher quality of care may also be explained by DONs being more likely to stay in positions at higher quality NHs. NHs with high DON turnover may experience a "quality meltdown," wherein persistent DON turnover results in lower quality, which may, in turn, make it difficult to retain well-qualified DONs (Tellis-Nayak, 2005). This reciprocal relationship between DON turnover and quality of care is consistent with past research that suggests that many DONs who leave their positions do so because of high levels of frustration and burnout which can result from difficulties in positively impacting quality of care (Larsen, 1993; Tellis-Nayak, 2005).

The associations between longer DON current job tenure and higher quality of care—that is, higher QM ratings and lower scores for several individual QMs—were statistically significant, but were of relatively low magnitude. For example, as described previously, for every year increase in DON current job tenure, NHs were 5% more likely to have four stars and 10% more likely to have five stars than one star. If, instead, the unit of measurement had been five year increments, the magnitude of the association would have been more striking: NHs would have been 30% more likely to have four stars and 62% more likely to have five stars than one star. It is noteworthy, however, that the mean DON current job tenure in this sample was only 3.3 years, meaning that many of these NHs may have DONs with too short of current job tenure to experience the potential benefit of longer tenure on quality of care.

Another explanation for the small magnitude of the association between DON current job tenure and quality of care is that accounting for DON current job tenure (and past experience) alone is insufficient to explain differences in QM ratings and the individual 10 QM scores. For example, according to Unruh and Wan's Systems Framework for Evaluating Nursing Care Quality (2004), NH quality may involve complex associations with contextual, structural, and process components of NH care. This study focused on the association between specific DON characteristics and quality of care, controlling for selected contextual and organizational components. Clearly, opportunities exist for expanding this research to examine additional management characteristics, including management practices (Anderson et al., 2003; Castle & Longest, 2006; Forbes-Thompson, Leiker, & Bleich, 2007), and other key aspects of quality.

Another possible explanation for the small magnitude of the association between DON current job tenure and quality of care is that, although DON current job tenure and past experience may have an important influence on quality, the measures used in this study were not sensitive to that influence. For example, a secular trend of performance improvement over time on publicly reported QMs may result in challenges demonstrating performance improvements that could be achieved by DONs with longer current job tenure or past experience. In support of this hypothesis, it is noteworthy that the weighted mean QM scores for the sampled NHs was less than 10% for 5 of 10 QMs—pain, urinary catheters, urinary tract infections, restraint use, and delirium in short-stay residents. Alternatively, some critics of Five-Star have argued that, because the rating system does not subdivide NHs into classes to reflect specialization, the QM ratings may be unduly low for NHs that care for critically ill residents with special needs (Hennessy-Fiske, 2009; Parenteau, 2009). Similarly, although the QMs were subject to extensive testing and capture a wide range of care processes and outcomes (Zimmermann et al., 1995), some researchers have voiced concerns regarding the adequacy of risk adjustment of the individual QMs that comprise the QM

rating (Arling, Lewis, Kane, Mueller, & Flood, 2007; Mukamel et al., 2008). The potential impact on the study findings of using a different risk-adjustment strategy for individual QMs, stratifying NHs according to specialization, or determining whether the NH is hospital-based or freestanding is unknown.

Although not the primary focus of this study, the results of the multivariate analyses presented in Tables 3 and 4 raise some interesting questions about the association between the selected market and organizational characteristics and quality of care. For example, while market competition was not associated with QM rating, lower market competition was inconsistently associated six of 10 individual QMs. That is, lower market competition was associated with lower quality of care for late loss ADL decline, urinary catheters, urinary tract infections, and delirium in short-stay residents, but higher quality of care for pressure ulcers in long-stay and short-stay residents. Additional research is needed on establish the extent to which QM ratings are sensitive to factors that have been shown to influence individual QMs.

Study Limitations

Although this study included data for a large, nationally representative sample of NHs and, therefore, had excellent power to detect small effects and yielded generalizable findings, the use of the 2004 NNHS as a data source for DON characteristics had several limitations. First, beyond the measurement of years of current job tenure and past experience, this study did not include other potentially important information pertaining to DONs because such data were not available. For example, past research has found associations between higher DON turnover and lower quality of care (Dunbar, Neufeld, & Libow, 1997; Kruzich et al., 1992). However, measures of DON turnover were not available in the 2004 NNHS.

Like many other studies in this area, this study used a cross-sectional, correlational design, which limits readers' abilities to make causal inferences. The 2004 NNHS contained data on DON current job tenure and past experience at a single time point only. Because repeated measures of DON current job tenure were not available, this study could not include a model how changes in DON tenure related to changes in quality of care over time. As a result, readers cannot definitively conclude that it is not actual quality that impacts DON current job tenure. For example, DONs working in low quality NHs may become frustrated and either quit and take a new position as DON in a higher quality NH or leave the profession altogether (Larsen, 1993; Tellis-Nayak, 2005). Additionally, this study utilized data on QM scores from the same period as data collection for the 2004 NNHS. A recent review of the research that examines the influence of top management on quality of care in nursing homes noted that studies vary widely in the sequence of data collection on top management and quality (Krause, 2010). That is, several of the reviewed studies measured quality months (or, in certain studies, years) before aspects of top management whereas other studies measured quality concurrently with or after data collection for aspects of top management. Additional research and scholarly debate is needed to establish the length of time until a DON could have an influence on quality and, thus, the optimal sequence for data collection for DON characteristics and quality of care.

In addition, this study did not control for all factors that may have influenced QM scores and ratings. For example, this study did not control for the potential influence of other top managers, including NHAs and medical directors or other aspects of staffing, such as nursing staffing levels and turnover, on QM ratings and QM scores.

Implications for Practice

The finding that longer DON current job tenure, but not past experience, was associated with higher quality of care has important implications for NH administrators and owners. In particular, administrators and owners have an important role in supporting DONs as they either transition into the role of the DON for the first time or learn to effectively fulfill their role in a new NH (Fleming & Kayser-Jones, 2008). This would be true regardless of whether this finding could be best explained by the minimal applicability of lessons learned in one NH for effectively coordinating, executing, and overseeing nursing care in another NH or a "quality meltdown," wherein persistent DON turnover results in lower quality of care, making it difficult to retain well-qualified DONs. Strategies for supporting DONs, which may lengthen tenure by reducing turnover, include providing additional leadership training and assisting them in managing or delegating competing demands (Fleming & Kayser-Jones, 2008; Tellis-Nayak, 2005).

Implications for Research—Additional research is needed to enhance our ability to draw conclusions about the association between DON characteristics and quality of care in NHs. For example, research is needed that focuses on additional DON characteristics, such as educational preparation and professional certifications; possible non-linear effects between DON characteristics and quality of care; and other important measures of quality of care, including deficiency citations and resident satisfaction. In addition, research is needed that examines how the interplay between DONs and other top managers—including NHAs and medical directors—and other aspects of staffing—including nursing staffing levels and turnover—relates to quality of care. Research is also needed to explore the reason for associations between top level management characteristics and quality of care. This study added to the literature by examining whether DON current job tenure and past experience were associated with quality of care. This study did not, however, seek to explain *why* these characteristics were or were not associated with quality of care. Therefore, it is unknown whether the association between longer DON current job tenure and QM scores and ratings could be explained by a learning curve or by some other factor. Information about the reason that certain top level management characteristics are associated with quality of care could provide important opportunities for interventions. If, for example, the association between longer DON tenure and higher quality of care was explained by the time it takes to adapt to the role of DON within a facility, researchers could aim to better support DONs during these transitions in addition to aiming to enhance DON retention.

Implications for Policy

By requiring state agencies to collect additional data about DONs, policy makers could greatly facilitate expanding this body of research and provide additional information to consumers for use when making decisions about NHs. One challenge associated with conducting research to examine the link between DON characteristics and quality of care is that there is little nationally available data about DONs. Aside from limited data from CMS' Online Survey and Certification and Reporting (OSCAR) file and the 2004 NNHS, nationally available data regarding DON characteristics are not widely available. As a result, researchers who wish to study the link between DON characteristics and quality of care must either use data available in the limited data sets or must collect primary data, which can be both time consuming and costly. Further exploratory research, which may include quantitative studies using small, non-generalizable samples as well as descriptive, qualitative studies, could have an important role in informing policy makers which additional data about DONs should be collected.

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Table 1

Descriptive Statistics

Measure category	Measure	M[a] (SE)	%[b] (SE)
Director of nursing characteristics	Current job tenure	3.3 (.14)	
	Past experience	3.38 (.17)	
Individual QMs	Late loss ADL decline	16.05 (.23)	
	Pain	6.28 (.19)	
	Pressure ulcers	13.5 (.25)	
	Urinary catheters	5.86 (.12)	
	Mobility decline	13.06 (.22)	
	UTIs	9.01 (.17)	
	Restraints	7.41 (.27)	
	Short-stay delirium	3.24 (.15)	
	Short-stay pain	22.15 (.42)	
	Short-stay pressure ulcers	18.62 (.32)	
Market characteristics	Market competition	.2 (.01)	
	Unemployment rate	5.74 (.06)	
QM rating	One star		18.78 (1.25)
	Two stars		23.11 (1.33)
	Three stars		24.97 (1.37)
	Four stars		23.03 (1.34)
	Five stars		10.11 (.94)
Organizational characteristics	Ownership (not-for-profit)		62.9 (1.51)
	Chain membership (non-chain)		55.47 (1.55)
	Facility size (≥ 100 beds)		50.61 (.69)
	Occupancy		
	Low (< 80%)		23.02 (1.29)
	Moderate (≥ 80%, but ≤ 94%)		41.32 (1.56)
	High (≥ 95%)		35.66 (1.54)
	Medicaid Census		
	Low (< 60%)		36.49 (1.51)
	Moderate (≥ 60%, but ≤ 79%)		42.32 (1.53)
	High (≥ 80%)		21.19 (1.29)

Note. ADL = activities of daily living; DON = director of nursing; SE = linearized standard error; UTI = urinary tract infection. The symbols "≥" and "≤" should be read as "greater than or equal to" and "less than or equal to," respectively.

[a]Weighted mean.

[b]Weighted percentage.

Table 2

Mean[a] Director of Nursing Current Job Tenure and Past Experience (in years) at Each Level of the Quality Measure (QM) Rating

QM rating	Current job tenure	Past experience
One star	2.68 (.27)	3.54 (.39)
Two stars	2.82 (.27)	3.7 (.38)
Three stars	3.25 (.24)	3.34 (.37)
Four stars	3.69 (.31)	2.94 (.34)
Five stars	4.8 (.63)	3.44 (.51)

Note. n = 1012. Linearized standard errors are in parentheses.

[a]Weighted means are presented.

Table 3

Relative Risk Ratios from the Logistic Regression Model

	QM rating			
	Two stars	**Three stars**	**Four stars**	**Five stars**
Market characteristics				
Market competition	0.62 (.26)	0.79 (.3)	0.69 (.27)	0.31 (.19)
Unemployment	0.97 (.05)	0.95 (.04)	0.97 (.04)	0.93 (.06)
Organizational characteristics				
For-profit : not-for-profit	0.81 (.19)	0.73 (.17)	0.92 (.22)	1.29 (.4)
Chain : non-chain	1.1 (.24)	0.85 (.19)	1.02 (.23)	0.73 (.21)
≥ 100 beds : < 100 beds	1.97 (.41)***	1.65 (.35)*	1.16 (.24)	0.57 (.16)*
Moderate : low occupancy	1.11 (.27)	1.95 (.49)**	1.88 (.48)*	1.92 (.64)*
High : low occupancy	1.29 (.35)	2.25 (.62)**	2.44 (.67)***	2.84 (.96)**
Moderate : low Medicaid census	1.49 (.35)	1.77 (.42)*	2.17 (.51)***	1.8 (.57)
High : low Medicaid census	1.77 (.53)	2.01 (.59)*	3.11 (.92)***	5.88 (1.98)***
DON characteristics (in years)				
Current job tenure	1.01 (.002)	1.03 (.002)	1.05 (.002)*	1.1(.002)***
Past experience	1.0 (.002)	0.99 (.002)	0.98 (.002)	1.01 (.002)

Note. DON = director of nursing; QM = quality measure. The symbols "≥" and "<'" should be read as "greater than or equal to" and "less than," respectively. One star is the reference group. n = 1012. $F(44, 950) = 2.68^{***}$

* p < .05.

** p < .01.

*** p <.001

Table 4

Incidence Rate Ratios from the Logistic Regression Models

	Quality measures									
	Late loss ADL decline	**Pain**	**Pressure ulcers**	**Urinary catheters**	**Mobility decline**	**UTI**	**Restraints**	**Short-stay delirium**	**Short-stay pain**	**Short-stay pressure ulcers**
	n = 968	**n = 974**	**n = 949**	**n = 974**	**n = 961**	**n = 974**	**n = 975**	**n = 877**	**n = 890**	**n = 877**
Market Characteristics										
Market Competition	1.16 (.07)*	1.18 (.12)	.83 (.07)*	1.41 (.12)***	1.02 (.06)	1.23 (.09)**	.85 (.11)	1.8 (.32)***	1.0 (.08)	.79 (.07)*
Unemployment	.99 (.006)	1.0 (.01)	1.02 (.01)	1.0 (.01)	1.0 (.01)	1.0 (.01)	1.02 (.01)	.99 (.02)	1.0 (.01)	1.03 (.01)***
Organizational Characteristics										
For-profit : not-for-profit	1.02 (.03)	1.08 (.07)	1.07 (.05)	1.06 (.06)	.99 (.04)	1.07 (.05)	1.11 (.1)	.9 (.08)	.86 (.04)***	.94 (.04)
Chain : non-chain	1.09 (.03)**	.97 (.06)	1.0 (.04)	.98 (.05)	1.04 (.04)	.98 (.04)	.95 (.07)	.88 (.08)	1.0 (.04)	.94 (.04)
≥100 beds : < 100 beds	1.02 (.03)	.87 (.05)*	1.13 (.04)**	1.05 (.05)	.97 (.03)	1.0 (.04)	1.18 (.09)*	.77 (.07)**	.87 (.03)***	1.08 (.04)*
Moderate : low occupancy	1.02 (.04)	.78 (.05)***	.99 (.05)	1.01 (.05)	1.03 (.05)	1.05 (.05)	.83 (.07)*	.97 (.11)	.82 (.04)***	.91 (.04)*
High : low occupancy	.96 (.04)	.78 (.06)***	.88 (.04)**	.89 (.05)*	1.02 (.05)	1.02 (.06)	.83 (.08)*	.92 (.11)	.77 (.04)***	.97 (.05)
Moderate : low Medicaid census	.95 (.03)	1.01 (.07)	1.01 (.04)	.86 (.04)**	.89 (.03)***	.9 (.04)*	1.02 (.09)	1.16 (.11)	.89 (.04)**	.94 (.04)
High : low Medicaid census	.86 (.04)***	1.06 (.09)	1.11 (.07)	.78 (.05)***	.75 (.04)***	.72 (.04)***	1.25 (.14)*	.93 (.12)	.8 (.05)***	1.04 (.05)
DON characteristics (in years)										
Current job tenure	0.99 (.0003)**	0.99 (.001)	0.99 (.0004)*	1.0 (.0004)	0.99 (.0003)**	0.99 (.0003)*	0.98 (.14)	0.98 (.001)*	1.0 (.0003)	1.0 (.0003)
Past experience	1.0 (.0002)	1.01 (.0005)	1.0 (.0003)	1.0 (.0003)	1.0 (.0003)	1.0 (.0003)	1.0 (.0006)	1.01 (.001)	1.0 (.0003)	1.0 (.0002)

	Quality measures									
	Late loss ADL decline	**Pain**	**Pressure ulcers**	**Urinary catheters**	**Mobility decline**	**UTI**	**Restraints**	**Short-stay delirium**	**Short-stay pain**	**Short-stay pressure ulcers**
	n = 968	**n = 974**	**n = 949**	**n = 974**	**n = 961**	**n = 974**	**n = 975**	**n = 877**	**n = 890**	**n = 877**
Chi-Square	F (11, 945) = 5.51***	F (11, 951) = 3.69***	F (11, 926) = 4.94***	F (11, 951) = 4.05***	F (11, 938) = 5.06***	F (11, 951) = 5.52***	F (11, 952) = 3.06***	F (11, 864) = 4.27***	F (11, 867) = 8.6***	F (11, 854) = 4.41***

Note. ADL = activities of daily living; DON = director of nursing; UTI = urinary tract infection. Linearized standard errors are in parentheses.

* p < .05.

** p < .01.

*** p < .001.