

Organizational Characteristics Associated With Staff Turnover in Nursing Homes

Nicholas G. Castle, PhD,¹ and John Engberg, PhD²

Purpose: The association between certified nurse aide, licensed practical nurse, and registered nurse turnover and the organizational characteristics of nursing homes are examined. **Design and Methods:** Hypotheses for eight organizational characteristics are examined (staffing levels, top management turnover, resident case mix, facility quality, ownership, chain membership, size, and Medicaid census), using Online Survey, Certification, and Reporting (known as OSCAR) data. Turnover information came from primary data collected from 854 facilities in six states (Missouri, Texas, Connecticut, New York, Pennsylvania, and New Jersey). **Results:** The 1-year turnover rates were 56.4%, 39.7%, and 35.8% for certified nurse aides, licensed practical nurses, and registered nurses, respectively. The results consistently show that, for all caregivers, lower staffing levels, lower quality, for-profit ownership, and higher bed size are associated with higher turnover. Some differences also are found for different levels of turnover, but there are few differences among types of nursing staff. **Implications:** Given that turnover rates are problematic, this study gives us a better understanding of the phenomenon and at the same time helps us further understand the wide variation that is known to exist between nursing homes, based on their organizational characteristics.

Key Words: Turnover, Quality indicators, Nursing homes, OSCAR, Long-term care staffing

The consequences of staff turnover in nursing homes are pervasive; they include increased facility costs, lower job satisfaction of staff, and overall lower resident quality of care (Castle & Engberg, 2005). For the facility having to hire replacement

staff, turnover can be expensive. Replacing a certified nurse aide (CNA) can cost \$2,200, and replacing a registered nurse (RN) can cost \$7,000 (Caudill & Patrick, 1991). Others have quoted differing costs (e.g., Straker & Atchley, 1999); nonetheless, in all cases these costs were substantial. Staff remaining at the facility often have to increase their workload until replacements are found. This can lower their job satisfaction and further their propensity to leave (Parsons, Simmons, Penn, & Furlough, 2003). However, the most serious consequence of staff turnover is the potential negative health outcomes for residents (Castle & Engberg; Harrington & Swan, 2003).

Despite the consequences associated with nursing home staff turnover, the high rate is a perennial issue of concern. For example, studies cite average annual CNA-turnover rates to be between 74% and 100%, with California having rates as high as 400% in some facilities (Cohen-Mansfield, 1997). In fact, it is clear from the literature that turnover of all staff is high in nursing homes and is especially high for CNAs (Cohen-Mansfield; Decker et al., 2003). What is less clear from the literature is the association of organizational characteristics with staff turnover. Examining organizational characteristics associated with staff turnover is important to give a better understanding of this phenomenon as well as the wide variation known to exist among nursing homes, based on their organizational context. As Phillips (2002, p. 154) has described, "some nursing homes are better than others, because some nursing homes are more effective organizations than other nursing homes," and the organizational context can help differentiate between more and less effective organizations.

Banaszak-Holl and Hines (1996) appear to have conducted the first study that examined the association between staff turnover and organizational characteristics; they found an average annual CNA turnover rate of 32%, and for-profit ownership ($p < .05$) and resident case mix ($p < .10$) were associated with this turnover. More recently, Brannon, Zinn, Mor, and Davis (2002) examined the association between CNA-turnover rate and job, organizational, and environmental characteristics. The authors found an average annual CNA-turnover rate of 51%, and

Address correspondence to Nicholas G. Castle, PhD, Health Policy and Management, University of Pittsburgh, A649 Crabtree Hall, 130 DeSoto Street, Pittsburgh, PA 15261. E-mail: castleN@Pitt.edu

¹Health Policy and Management, University of Pittsburgh, PA.

²RAND, Pittsburgh, PA.

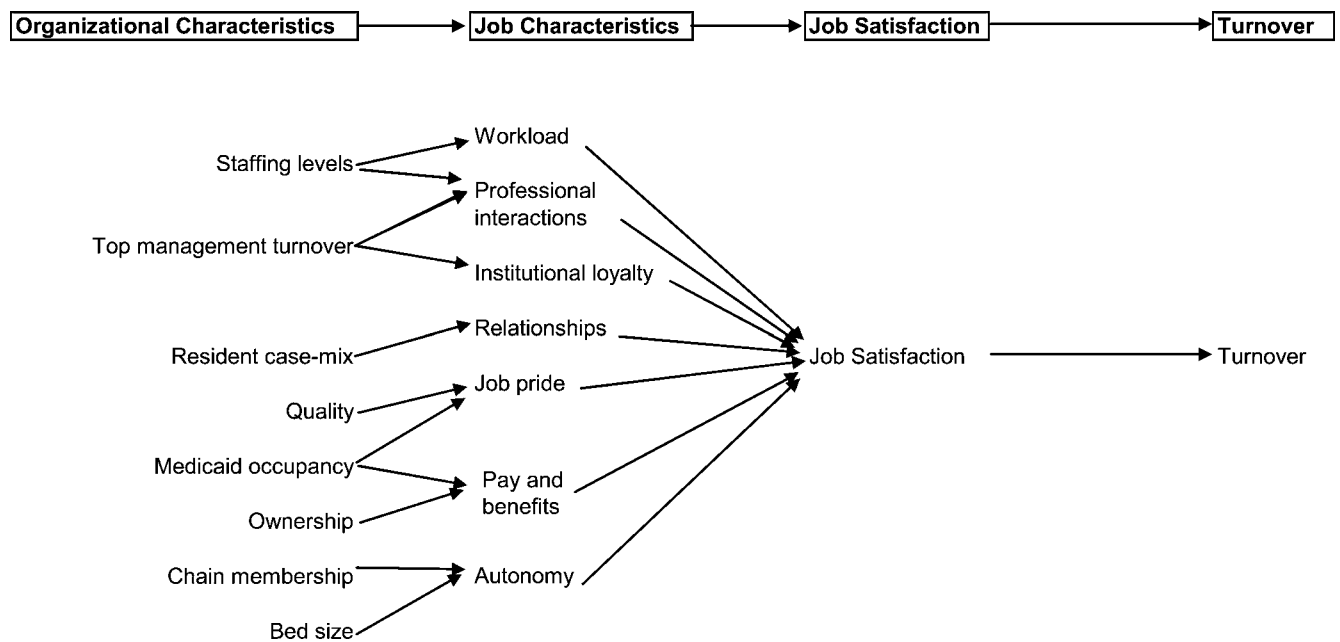


Figure 1. Conceptual model.

for-profit ownership ($p < .00$) and chain membership ($p < .09$) were associated with high CNA turnover; RN turnover ($p < .03$) was associated with low CNA turnover (Brannon et al.).

In another recent study, Harrington and Swan (2003) examined turnover for all nursing staff in California nursing homes, including directors of nursing (DONs), RNs, licensed practical nurses (LPNs), and CNAs. The turnover rate was 71%; significant organizational characteristics included for-profit ownership ($p < .01$), number of beds ($p < .01$), occupancy rate ($p < .01$), Medicaid occupancy ($p < .01$), rural location ($p < .05$), RN staffing levels ($p < .01$), and activities of daily living (ADL) dependency of residents ($p < .01$).

In this investigation we use data collected in 2003 from 854 nursing homes to examine the association between staff turnover and organizational characteristics, while controlling for local economic conditions. We also expand on prior analyses by examining RN and LPN turnover in addition to CNA turnover. The organizational characteristics examined are staffing levels, top management turnover, resident case mix, facility quality, ownership, chain membership, size, and Medicaid census.

Conceptual Model and Hypothesis

Numerous models of staff turnover exist in the literature, and most attribute turnover to job satisfaction (e.g., Parsons et al., 2003). As Sheridan and Abelson (1983) state, "the termination decision process can be described as a sequence of cognitive stages starting with an initial dissatisfaction with the present job" (p. 418). Job satisfaction is defined as "the favorableness or unfavorableness with which employees view their work" (Grieshaber, Parker, & Deering,

1995; p. 19), and it is based largely on characteristics of the job. Because of this strong link between job satisfaction and turnover, we base our hypotheses for this study on this literature. Moreover, we propose that job characteristics and job satisfaction are latent and intermediary variables between organizational characteristics and turnover (see Figure 1). As described in the following paragraphs, job satisfaction is influenced by perceptions of autonomy, workload, and pay and benefits (Price, 2000); these factors vary according to organizational characteristics.

Research examining job satisfaction of nursing home staff varies in terms of the job-satisfaction instruments used (e.g., Coward et al., 1995; Grau, Chandler, Burton, & Kolditz, 1991). However, one common finding is that job satisfaction is highly associated with workload (Chou, Boldy, & Lee, 2002). Lower job satisfaction, in turn, is highly associated with turnover (Parsons et al., 2003). Given that the workload of staff will likely vary with staffing levels, we form the following hypothesis: Higher staffing levels (a, RNs; b, LPNs; c, CNAs) in nursing homes will be associated with lower nursing staff turnover (H1a, b, c).

Some recent literature has shown that top management turnover is influential in nursing homes (Castle, 2005). Anderson, Issel, and McDaniel (2003), for example, recently determined that longer DON tenure was associated with better resident outcomes. Top management turnover also may influence employees' commitment to the organization. Grau and colleagues (1991) have shown that nursing home top management can influence CNAs' institutional loyalty. We make the following hypothesis: Higher top management turnover in nursing homes will be associated with higher nursing staff turnover (H2).

Again using robust results from the job-satisfaction literature, we find it evident that nursing home staff enjoy contact and relationship building with nursing home residents (Parsons et al., 2003). With more residents in the nursing home with terminal illnesses or severe dementia (i.e., a higher case mix), the time for staff to build relationships with residents and the ability of residents to form such relationships will likely decrease. Banaszak-Holl and Hines (1996) also found CNA turnover rates to be positively associated with resident case mix. We form the following hypothesis: Lower aggregate resident case mix in nursing homes will be associated with lower nursing staff turnover (H3).

It follows from this hypothesis that if staff value residents and take pride in their jobs, then they would value caring for residents in a high-quality manner. Staff are likely to value working in a high-quality facility and be less likely to leave the facility. Several studies have shown poor quality to be associated with higher staff turnover (e.g., Castle & Engberg, 2005; Harrington & Swan, 2003), which posits a causal effect of turnover on quality. Nevertheless, a reciprocal relationship between these two constructs may exist, whereby quality also influences staff turnover. Indeed, Bergman, Eckerling, Gollander, Sharon, and Tomer (1984) found staff perceptions of quality to be associated with turnover. We make the following hypothesis: Higher facility quality in nursing homes will be associated with lower nursing staff turnover (H4).

For-profit or not-for-profit ownership has been shown to be an important factor influencing a variety of outcomes, because the organizational goals and resultant behavior of these two types of providers are thought to be different. For example, for-profit nursing homes are often seen as having to account for the bottom line and diverting resources from resident care and staff benefits. As Harrington, Woolhandler, Mullan, Carrillo, and Himmelstein (2001) describe, "profit seeking diverts funds and focus from clinical care" (p. 1454). The opposite is thought to be true of not-for-profit nursing homes in which better benefits are available (Grau et al., 1991), attracting staff away from for-profit facilities (Bergman et al., 1984). Banaszak-Holl and Hines (1996) also found CNA turnover rates to be positively associated with for-profit ownership. We make the following hypothesis: Not-for-profit nursing homes will be associated with lower nursing staff turnover (H5).

Facilities belonging to chains are commonly thought to benefit from economies of scale, such as system-wide discounts for supplies. However, belonging to a corporate entity is not always positive (O'Neill, Harrington, Kitchener, & Saliba, 2003). A degree of standardization and oversight often comes with chain ownership, requiring nursing staff and management to document their activities extensively (Banaszak-Holl, Berta, Bowman, Baum, & Mitchell, 2001). The job-satisfaction literature indicates that

employees tend to become dissatisfied by such oversight (Coward et al., 1995). Brannon and associates (2002) also found chain membership to be associated with high CNA turnover. We form the following hypothesis: Non-chain-ownership nursing homes will be associated with lower nursing staff turnover (H6).

The degree of employee oversight probably differs substantially in small and large nursing homes. Small facilities tend to have fewer available resources and are less likely to monitor staff, whereas the reverse is true for larger organizations, which are commonly thought of as bureaucratic (Eaton, 2000). Indeed, Anderson and colleagues (2003) have shown management practices to vary by facility size. Other research has concluded that "nursing home employees are most satisfied in an environment where individual efforts are rewarded" (Mullins, Nelson, Busciglio, & Weiner, 1988; p. 16). Small facilities are often thought to exhibit this type of behavior of rewarding employees (Eaton). Bergman and associates (1984) also found staff turnover to be lower in smaller facilities. We form the following hypothesis: Small nursing homes will be associated with lower nursing staff turnover (H7).

Low Medicaid payment rates in many states may not provide nursing homes with sufficient revenue to offer adequate-quality care (Grabowski, 2001). Indeed, homes with a high Medicaid census have become known as "Medicaid Mills," and generally have poor reputations. Again, it follows from the aforementioned argument that, if staff value residents and take pride in their jobs, then they would likely leave facilities with a high Medicaid census. It is also likely that, if these facilities skimp on resident care, they also provide fewer benefits to staff. We make the following hypothesis: Lower nursing home Medicaid census will be associated with lower nursing staff turnover (H8).

Methods

Sources of Data

Data used here are from three sources; first, a survey of nursing home administrators conducted in March 2003; second, the 2004 Online Survey, Certification, and Reporting (OSCAR) data; and, third, the 2004 Area Resource File (ARF). The information regarding staff turnover came from the administrator survey, organizational characteristics came from the OSCAR data, and characteristics of local economic conditions came from the ARF.

We collected the information on staff turnover for this investigation (and describe it further in the following paragraphs). We collected information regarding turnover of CNAs, LPNs, RNs, and top management, including the shift worked, part-time staff, and voluntary and involuntary turnover. This primary data collection was necessary because turnover information is rarely found in commonly

used secondary sources for nursing home information. We also collected information on staffing levels for the three types of nursing staff. We considered this to be necessary, because even though this information is included as part of the OSCAR data, it is considered less reliable than most other data elements (Straker, 1999).

The OSCAR data collection, which includes approximately 300 data elements, is conducted by state licensure and certification agencies as part of the Medicare–Medicaid certification process, and it includes most facilities in the United States. In 2004, approximately 17,000 facilities were included in the database, including all of the facilities used in this analysis. Resident data elements relevant to this study include measures of ADLs (used in the study to measure case mix); organizational data relevant to this study include chain membership, occupancy rate, and ownership characteristics.

The OSCAR data are often used by researchers as a secondary source of nursing home characteristics. In recent years OSCAR data also have been used by both state and federal governments to produce Web-based nursing home report cards. Most significantly, some OSCAR data elements are included in the federal Nursing Home Compare report card initiative. Several authors also have noted that the OSCAR variables they used were reliable, including staffing variables (Harrington, Zimmerman, Karon, Robinson, & Beutel 2000) and organizational characteristics (Castle & Engberg, 2005; Hughes, Lapane, & Mor, 2000).

ARF data are compiled from a number of data sources, including the American Hospital Association (AHA) annual hospital survey and the U.S. Census of Population and Housing, and they are aggregated at the county level. The national ARF contains several thousand variables for each county in the United States on population characteristics, socioeconomic features, and health care resources. These data were used to examine local economic conditions such as the unemployment rate, number of nursing home beds in the county, and per capita income.

Sample Selection

We mailed the questionnaire to nursing home administrators during the spring of 2003. Facilities were located in six states: Missouri (MO), Texas (TX), Connecticut (CT), Pennsylvania (PA), New York (NY), and New Jersey (NJ). We chose these states because two were reported to have high staff turnover (MO and TX), two were reported to have medium turnover (NY and PA), and the remaining two states were reported to have lower staff turnover (CT and NJ).

We obtained information regarding levels of staff turnover in each state by examining American Health Care Association (AHCA) data from 2002, which includes information from 6,991 facilities in

all 50 states (Decker et al., 2003). By using the tercile distributions of CNA turnover, we divided these states into high, medium, and low staff turnover. We randomly chose two states from each tercile. MO facilities had an average of 123% CNA turnover and TX facilities had an average of 105% CNA turnover. PA facilities had an average of 51% CNA turnover and NY facilities had an average of 49% CNA turnover. CT facilities had an average of 42% CNA turnover and NJ facilities had an average of 46% CNA turnover.

The facility sample consisted of a random sample of approximately 35% ($n = 1,426$) of facilities chosen from each state's pool of eligible facilities. We defined eligible facilities as nursing homes participating in Medicare–Medicaid certification. We used this eligibility definition because these are the facilities included in the OSCAR data, which we used to identify facilities in each state. Eligible facilities included 623 nursing homes from MO, 1,331 from TX, 749 from PA, 673 from NY, 321 from CT, and 355 from NJ.

Analyses

We performed all analyses by using the Stata software (Stata Corporation, 2005). We first examined correlations between the variables, to identify whether the data had any problems of collinearity (not reported). Based on a threshold of .8, the variables showed no problems of collinearity. In the multivariate analyses, we used negative binomial regression models to estimate the relationship between turnover and organizational characteristics. Negative binomial regression is a generalization of the more-familiar Poisson regression. Like the Poisson regression, it is an appropriate functional form for count data, but it allows for more unobserved heterogeneity among facilities. We also examined the relationship between organizational characteristics and the probability of being outside of the range of average turnover. We estimated two logistic regression models, one for the probability of having turnover above a low threshold of 20% and one for having turnover above a high threshold of 50%. We used this analytic approach because previous analyses have shown that high and low turnover may have different antecedents (Brannon et al., 2002; Castle & Engberg, 2005).

Model Specification and Operationalization

The dependent variables of interest are CNA, LPN, and RN turnover rates as well as a combined turnover rate for all caregivers. We define turnover as the sum of voluntary terminations for 6 months divided by the sum of established positions. We collected this information for the number of

full-time-equivalent (FTE) staff and multiplied by 2, to give an annual rate. The FTE rate measures how many full-time persons work in the facility. A 35-hr week is usually considered to be a full-time position (or 1 FTE). For our rate, this included staff on all shifts and part-time staff. We used this definition (and the 6-month time frame) because in prior analyses we determined the reported rates to be more precise than other definitions of turnover.

To facilitate the examination of different associations between turnover and organizational characteristics at different levels of turnover, we grouped the facilities into three categories, which we define as 0–20%, 21–50%, and greater than 51% turnover, respectively. We used this low group because a prior study in other sectors of health care suggests that a 0–20% level of turnover has different consequences from other levels (Abelson & Baysinger, 1984). High levels of turnover also are commonly thought to be detrimental to organizations. An often-quoted level of detrimental high turnover is 51% (Abelson & Baysinger; Price, 2000); therefore, we used this level to define the high-turnover groups. Brannon and associates (2002) also used “high” and “low” turnover rates in their analyses, as they also proposed that these rates would differentially affect facilities.

We also investigated whether the effect of the various organizational characteristics differs, depending on whether the level of the characteristic is low or high. We allow for such nonlinear relationships by including squared terms of all variables, except the dichotomous variables. A significant coefficient on a squared term indicates that the relationship between the variable and turnover differs between low values and high values of the variable. If the transformed coefficient (incident rate ratios for negative binomial regressions and odds ratios for logistic regressions) on the squared term is greater than one, then the relationship is more positive (or less negative) at higher values of the explanatory variable.

In recognition that coefficients can be difficult to interpret when both linear and squared terms are included for each variable (and that this approach introduces multicollinearity), we provide graphs of the predicted relationship between selected explanatory variables and the predicted outcomes. For example, to understand the relationship between CNA staffing levels and expected turnover, we graph the relationship as estimated from the negative binomial regression as CNA staffing levels range from a low level (10th percentile of observed distribution) to a high level (90th percentile of observed distribution), holding all other explanatory variables constant at their median values. In order to examine the relationship of CNA staffing to the probability that a facility has low or high turnover, we created a similar graph by using the two logistic regression specifications.

In examining the association of turnover with organizational characteristics, we include staffing

levels within facilities, that is, FTE per resident for CNAs, LPNs, and RNs, including full-time, part-time, and temporary staff.

We use nursing home deficiency citations as a measure of quality. Deficiency citations are departures from federal nursing home standards, as identified by state or federal nursing home inspectors. We use only quality-related deficiencies in this analysis (see General Accounting Office [now Government Accountability Office, GAO], 1998, for specific definitions and further explanation of the deficiency citation process). These 19 deficiencies are resident centered and are frequently used as proxy measures of care quality (GAO). One limitation of using deficiency citations is that their use varies from state to state, making the actual number received by a facility in one state not directly comparable with those received by a facility in another state (Institute of Medicine [IOM], 2001). Thus, for this study, some further refinement of this deficiency-citation measure was necessary, because we used facilities from six states. We compared facilities by using the percentile rank of the number of deficiencies determined from a facility’s relative standing within its own state.

We examined resident case mix by using an ADL score in the OSCAR. We assigned each of three ADL questions (regarding eating, toileting, and transferring) a score from 0 to 3 (no assistance, moderate need for assistance, and high degree of need for assistance) and then summed these scores. We define occupancy as the percentage of nursing home beds with residents and size by the number of beds. We defined ownership as either for profit or not for profit. Chain membership is also a dichotomous variable, indicating whether or not the facility belonged to a chain. Medicaid census represents the percentage of residents whose care is paid for under the Medicaid program. We also include a Chain Membership \times For-Profit Status interaction in order to examine whether the effect of chain membership differs by profit status. We include rural location as caregivers in rural facilities may have fewer alternative employment opportunities (Decker et al., 2003).

We also controlled for local economic conditions that can influence staff turnover, by including the county unemployment rate, total number of nursing home beds in the county, and per capita income. The inclusion of these factors follows the work of Banaszak-Holl and Hines (1996).

Results

The nursing home survey sample includes 1,107 responses (response rate = 77%). In some cases, the turnover questions were not answered, resulting in an analytic sample of 854 facilities (and an effective response rate of 60%). The response rate varied a little across the states, with MO having a response rate of 69% ($n = 157$), TX 68% ($n = 354$), PA 80%

Table 1. Descriptive Statistics

Variable	M or %	SD
Dependent variables		
RN turnover	35.8%	41.6
LPN turnover	39.7%	49.9
CNA turnover	56.4%	78.9
Organizational characteristics		
FTE RNs per 100 residents	15.8	9.8
FTE LPNs per 100 residents	17.7	8.8
FTE CNAs per 100 residents	36.3	17.9
Top management turnover	128%	89.3
ADL score	6.9	2.4
Quality of care health deficiencies	4.5	4.6
For profit	56%	—
Chain membership	43%	—
For-profit chain	31%	—
Bed size	134	105
Medicaid census	53.6%	22.9
Average occupancy	85.8%	15.2
Rural location	46%	—
County economic characteristics		
Unemployment rate	42.7	16.6
Number of beds in county	3,682	3,557
Per capita income	28,550	10,476

Notes: RN = registered nurse; LPN = licensed practical nurse; CNA = certified nurse aide; FTE = full-time equivalent; ADL = activity of daily living. For the table, *N* = 852 facilities.

(*n* = 220), NY 78% (*n* = 195), CT 70% (*n* = 88), and NJ 67% (*n* = 93). These missing data were evenly distributed across states, and we identified no differences between these facilities and those providing the turnover data. Table 1 presents descriptive statistics for the variables used in the analysis. The average annual RN, LPN, and CNA turnover rates were 35.8%, 39.7%, and 56.4%, respectively.

The results of the analyses were remarkably similar for the three types of staff (CNAs, LPNs, and RNs). Further inspection of the data showed that turnover rates for the three types of staff had correlations between 0.83 and 0.91. Therefore, we present the analysis of combined turnover, as it is adequate to capture the relationship between organizational characteristics and turnover, and we discuss the few differences between staff groups. (Results for CNA, LPN, and RN analyses are available from the authors.)

Table 2 provides the results of the multivariate estimates, with the three measures of combined turnover as dependent variables. As indicated in the table, each of the squared terms except those for the ADL score and the number of beds in the county is significant in at least one of the specifications, suggesting important differences in the effect of the variables at high and low variable levels.

The presence of the squared terms makes the effect of each variable difficult to interpret from the coefficients. Therefore, in Figures 2 and 3 we present graphs of predicted values for each of the dependent variables, while changing organizational character-

istics one at a time. Figure 2 presents the relationship between staffing levels and turnover and Figure 3 presents the relationship between two other organizational characteristics (number of deficiency citations and number of beds) and turnover. For brevity, we show only organizational characteristics with robust significant findings.

We present these relationships for combined turnover as well as for each separate category of staff. As one can easily see, the relationships are very similar for all the categories of staff. The following description of the results focuses on the combined turnover estimates presented in Table 2 and in the bottom row of Figures 2 and 3, although we do note differences among the staff types where they exist.

The diamond-studded line in bottom left panel of Figure 2 indicates that combined turnover is lower in facilities with higher CNA staffing. The squared term associated with CNA turnover, presented in the second column of Table 1, is significant and greater than one, suggesting that the relationship between staffing and turnover becomes less negative at higher levels of staffing. We can see this nonlinear relationship by the curve in the diamond-studded line in the graph.

The other two lines in the panel show the relationship between CNA staffing and the probability of having extreme levels of turnover. The square-studded line has a much steeper slope, indicating that differences in CNA staffing are associated with a big difference in the probability of having high turnover. Although differences in turnover are significantly related to differences in the probability of turnover being greater than 20%, the triangle-studded line indicates that this relationship is not as steep. The panels above this one show that the relationship of CNA staffing to turnover of each staff type is similar, although the slope of the relationship with RN turnover is less steep.

The middle panel in the bottom row of Figure 2 shows that the relationship between LPN staffing levels and combined turnover takes a much different form than that for CNA staffing. Turnover is lowest at facilities with low levels of LPN staffing. At staffing levels above the mean value of 18 LPNs per 100 beds, higher staffing levels are not associated with higher levels of turnover. In fact, the square-studded line in the panel that represents the probability of turnover being greater than 50% suggests that very high turnover is equally rare when LPN staffing is very high or very low. The top two panels in the column that show the relationship between LPN staffing and CNA and LPN turnover shows a similar inverted U-shaped relationship between LPN staffing and the probability of high turnover, whereas RN turnover appears to be relatively insensitive to LPN staffing levels.

The third column of Figure 2 shows that RN staffing has a strong positive association with turnover. As shown at the left edge of the bottom panel in this

Table 2. Relationship Between Combined Caregiver Staff Turnover (CNAs, LPNs, and RNs) and Organizational Characteristics

Variable	Full Turnover Distribution Negative Binomial Regression		Probable (Turnover > Moderate) Logistic Regression		Probable (Turnover > Low) Logistic Regression	
	Linear Terms	Squared Terms	Linear Terms	Squared Terms	Linear Terms	Squared Terms
FTE RNs per 100 residents	1.163*** (0.026)	0.998*** (0.001)	2.546*** (0.616)	0.983*** (0.005)	1.245** (0.109)	0.997 (0.002)
FTE LPNs per 100 residents	1.066*** (0.022)	0.999*** (0.000)	1.305 (0.262)	0.993* (0.004)	1.119* (0.066)	0.997*** (0.001)
FTE CNAs per 100 residents	0.952*** (0.011)	1.001*** (0.000)	0.809*** (0.048)	1.001*** (0.000)	0.942* (0.030)	1.000* (0.000)
Top management turnover (scaled as turnover per FTE) ^a	1.130 (0.090)	1.008 (0.019)	2.842*** (1.146)	1.032 (0.125)	0.226*** (0.077)	1.323*** (0.111)
ADL score (scaled as score × 10) ^a	1.082 (0.099)	0.984 (0.015)	1.167 (0.521)	0.941 (0.066)	1.346 (0.373)	0.947 (0.043)
Quality of care deficiencies	1.107*** (0.015)	0.998*** (0.000)	1.365*** (0.095)	0.993** (0.003)	1.137*** (0.046)	0.997** (0.001)
For profit	1.157* (0.102)		1.169 (0.479)		0.968 (0.223)	
Chain member	1.131 (0.113)		1.764 (0.894)		1.054 (0.307)	
For-profit chain	0.787* (0.098)		0.338* (0.195)		1.056 (0.372)	
Bed size (scaled as beds per 100) ^a	0.905* (0.048)	1.021*** (0.004)	0.634* (0.159)	1.100*** (0.028)	1.337* (0.210)	0.995 (0.014)
Medicaid census	1.512 (0.596)	0.524 (0.210)	360.326*** (797.692)	0.005** (0.013)	1.395 (2.256)	0.742 (1.243)
Average occupancy (scaled as percentage ÷ 10) ^a	1.166 (0.135)	0.988 (0.008)	3.671*** (1.688)	0.907*** (0.031)	1.024 (0.450)	0.995 (0.030)
Rural location	0.773** (0.083)		0.773 (0.403)		0.768 (0.221)	
Unemployment rate	0.824*** (0.046)	1.013*** (0.004)	0.355*** (0.111)	1.075*** (0.029)	0.527** (0.148)	1.052** (0.027)
No. of beds in county	1.069 (0.083)	0.998 (0.006)	1.242 (0.422)	0.992 (0.027)	1.181 (0.219)	0.990 (0.015)
Per capita income (scaled as dollars per 1,000) ^a	0.718*** (0.088)	1.022** (0.011)	0.462 (0.346)	0.978 (0.089)	0.358*** (0.131)	1.078** (0.034)
Observations	852		852		852	
Model degrees of freedom	28		28		28	
Log likelihood	-3,403.373		-189.858		-410.362	

Notes: CNA = certified nursing assistant; LPN = licensed practical nurse; RN = registered nurse; FTE = full-time equivalent; ADL = activity of daily living. Robust standard errors are presented in parentheses and were adjusted for clustering by county. All coefficients are presented in exponentiated form—incident rate ratios for negative binomial and odds ratios for logistic.

^aVariables are rescaled to prevent numerical difficulties during estimation.

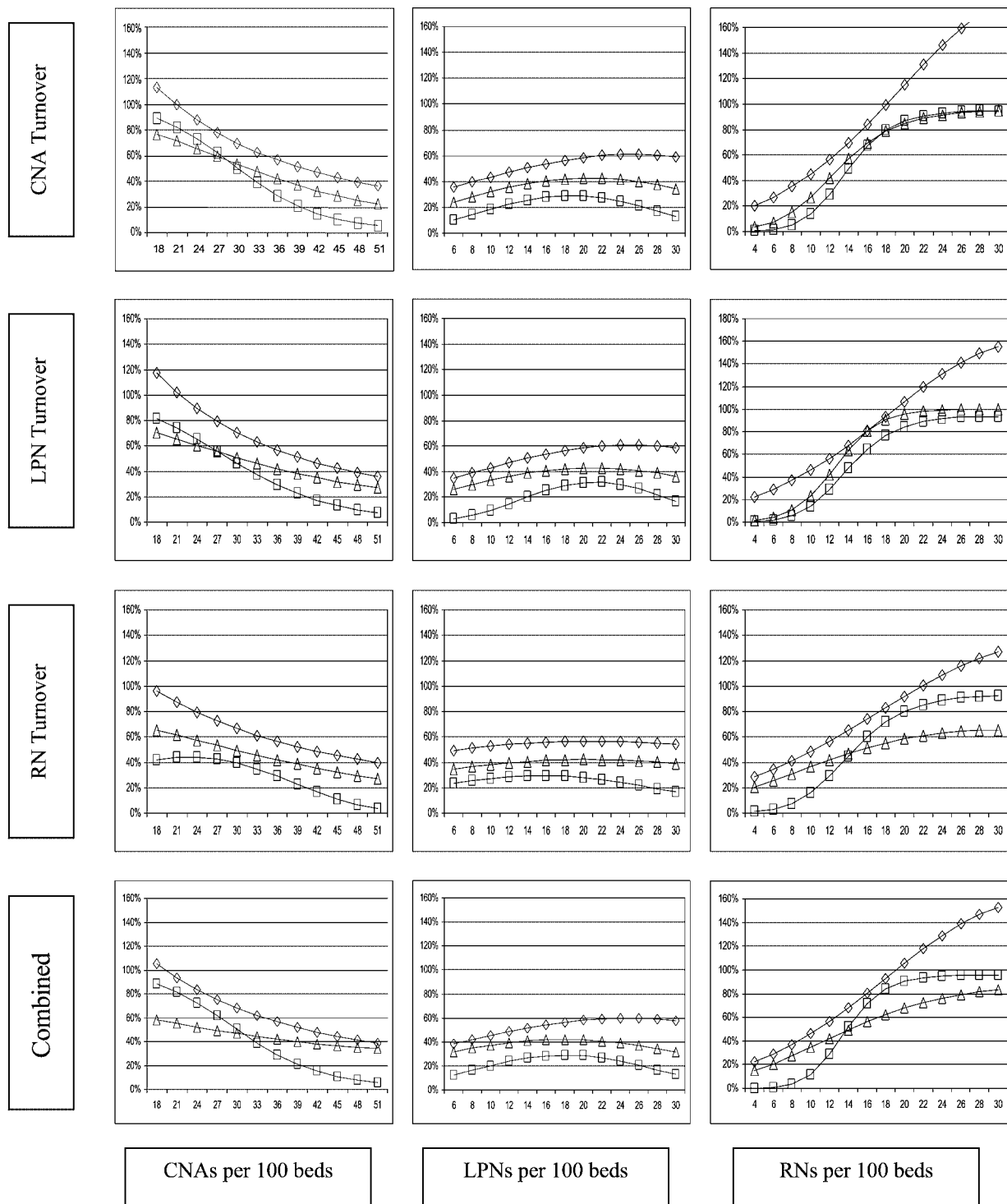
*Statistically significant at $p = <.1$ level or better; **statistically significant at $p = <.05$ level or better; ***statistically significant at $p = <.01$ level or better.

column, facilities with four RNs per 100 beds (which is the 10th percentile of RN staffing levels) have a predicted combined turnover rate of approximately 20%; in contrast, facilities with 30 RNs per 100 beds (the 90th percentile) have a predicted turnover rate of over 150%. The top panel in this column shows that the relationship between RN staffing and CNA turnover is even steeper.

Figure 3 provides similar information for selected facility characteristics. Although space prevents us from providing graphs for all the explanatory variables in Table 2, we now discuss the patterns seen from an examination of the coefficients. There is no

significant relationship between the average facility ADL score and combined turnover as measured by any of the three dependent variables. Similarly, the coefficients on the dichotomous variables representing chain membership and the interaction with profit status are not significant at the 5% level, suggesting little relationship between these characteristics (either alone or combined) and nursing staff turnover.

Although neither the linear nor the squared term for top management turnover is significant, a joint test indicates that the hypothesis that both are zero ($p < .0001$) can be rejected. The signs of these coefficients suggest that combined nursing staff



◇ = expected turnover □ = probability (turnover > 50%) △ = probability (turnover > 20%)

Figure 2. Estimated relationships between staffing levels and turnover.

turnover has a positive relationship with top management turnover and that the relationship is steeper at high values of top management turnover. The coefficients on these terms in the logistic regression of the probability of high turnover

presented in the middle two columns of Table 2 show a similar pattern. However, the coefficients on the logistic regression of having greater than low turnover show that facilities with higher top management turnover have a higher probability of lower

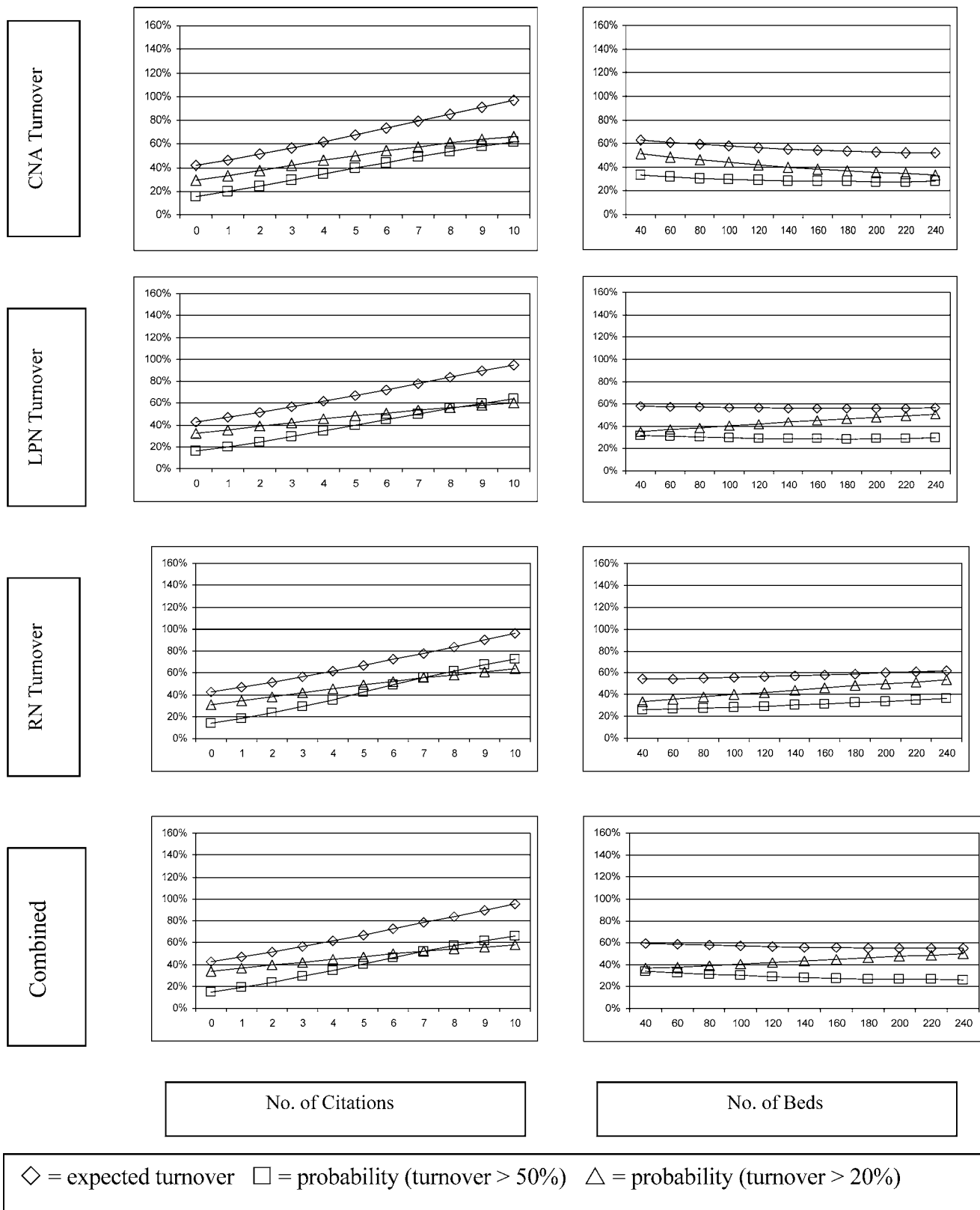


Figure 3. Estimated relationships between organizational characteristics and turnover.

and higher turnover. That is, facilities with high top management turnover are likely to have either very high or very low combined nursing staff turnover, but not moderate turnover.

Discussion

Our analyses include three different types of caregivers (RNs, LPNs, and CNAs), with analyses of turnover for each of these staff and overall

Table 3. Summary of Results for Each Hypothesis for Each Caregiver Type

Hypothesis	Description	CNA	LPN	RN	All Staff
H1a	Higher staffing patterns of RNs in nursing homes will be associated with lower nursing staff turnover.	OP	OP	OP	OP
H1b	Higher staffing patterns of LPNs in nursing homes will be associated with lower nursing turnover.	OP	OP	NS	OP
H1c	Higher staffing patterns of CNAs in nursing homes will be associated with lower nursing staff turnover.	S	S	S	S
H2	Higher top management turnover in nursing homes will be associated with higher nursing staff turnover.	S	NS	S	NS
H3	Lower aggregate resident case-mix in nursing homes will be associated with lower nursing staff turnover.	NS	NS	NS	NS
H4	Higher facility quality in nursing homes will be associated with lower nursing staff turnover.	S	S	S	S
H5	Not-for-profit nursing homes will be associated with lower nursing staff turnover.	S	S	S	S
H6	Nonchain nursing homes will be associated with lower nursing staff turnover.	NS	NS	NS	NS
H7	Small nursing homes will be associated with lower nursing staff turnover.	S	S	NS	S
H8	Lower nursing home Medicaid census will be associated with lower nursing staff turnover.	NS	NS	NS	NS

Notes: CNA = certified nurse aide; LPN = licensed practical nurse; RN = registered nurse; All Staff = CNAs, LPNs, and RNs; OP = supported in opposite direction; NS = not supported; S = supported.

turnover (low, medium, and high). The summarized results for the eight hypotheses are shown in Table 3. Overall, using the full sample, consistent support is found for four of the eight hypotheses across all three staff groups (i.e., H1a, b, c, H4, H5, and H7). Some differences are also found for different levels of turnover, but few differences are found between types of nursing staff.

The results were particularly robust for the association between high turnover and lower staffing levels for CNAs (i.e., H1a). These results follow the job-satisfaction literature that shows nursing home staff are particularly sensitive to workload (Chou et al., 2002). They also suggest that higher mandated minimum staffing levels in nursing homes (Harrington & Swan, 2003) could reduce staff turnover; however, increasing staffing levels could be costly to facilities. Reduced turnover rates will likely save some facility expenditures, thereby helping offset at least some of the expense associated with higher mandated minimum staffing levels.

The results for quality of care were also particularly robust (i.e., H4). The quality-of-care deficiencies results show that nursing staff are sensitive to the quality of the facility, with high turnover associated with low quality. Again, the job-satisfaction literature would suggest that nursing staff value caring for residents in a high-quality fashion. Clearly, care must

be taken in interpreting these cross-sectional findings, but this result may be an indication that the seemingly intransigent low-quality levels in nursing homes in recent years may be partially responsible for continued high staff turnover.

The results also show that for-profit ownership is associated with higher turnover (i.e., H6). Following the prior hypothesis that nursing staff are sensitive to the quality of the facility, this result may reflect the generally lower quality of care found in for-profit facilities (Harrington et al., 2001). Alternatively, benefit packages may be below industry norms in for-profit facilities.

Smaller nursing home size is associated with lower turnover (i.e., H7). This result may reflect the lesser degree of oversight that is thought to exist in small nursing homes. Alternatively, small nursing homes are often thought to reward employees more frequently than large nursing homes (Eaton, 2000).

Banaszak-Holl and Hines (1996) found for-profit ownership and resident case mix to be associated with CNA turnover, and Brannon and colleagues (2002) found for-profit ownership and chain membership to be associated with high CNA turnover. Our results differ from these prior studies for case mix and chain membership, but they are similar with respect to for-profit ownership. Some differences would be expected between our study and these

previous works because, as stated previously, the nursing home industry has changed significantly since these prior studies were conducted.

Our hypotheses are based on a conceptual model whereby organizational characteristics are proposed to influence job characteristics and job satisfaction, and job satisfaction in turn influences turnover (shown in Figure 1). Thus, further speculations from the findings are that workload, relationships, job pride, and pay and benefits may be most influential in determining the job satisfaction of nursing staff. Although the relationships shown in this conceptual model are well established in the literature (see Price, 2000 for a review), only organizational characteristics and turnover are measured as part of this investigation. We also acknowledge that very little of the existing literature examining the intermediate relationships (job characteristics and job satisfaction) is based in long-term-care settings. Therefore, determining whether job characteristics and job satisfaction in nursing homes are influenced by these intermediaries and whether they vary by organizational characteristics would further strengthen the findings.

Brannon and associates (2002) used “high” and “low” turnover rates in their analyses, as they also proposed that these rates would differentially influence facilities. An important finding of the current study is further showing the complexity of the relationships between different levels of turnover and organizational characteristics. In this case, to facilitate the examination of different associations between turnover and organizational characteristics at different levels of turnover, we grouped the facilities into three categories based on prior theory.

The influence of different levels of turnover is further complicated by differential findings for many of the organizational characteristics examined according to the levels of the organizational characteristics. With the exception of quality, most findings in the analyses were nonlinear. In turn, both the influence of different levels of turnover and the differential findings for many of the organizational characteristics could be further complicated by the three different staff types examined. However, in our analyses, few differences were found in results based on CNA, LPN, or RN staff group.

Limitations and Suggestions for Further Research

Given the fact that this study only used six states and had an analytic sample of 854 facilities, the results may not be nationally representative. Using the OSCAR data, we were able to ascertain that the facility characteristics of the analytic sample (ownership, size, and census) were nationally representative (analysis not shown). This, of course, does not mean that the turnover characteristics reported from this sample are nationally representative.

It should be recognized that the OSCAR data do have limitations. An examination of the organiza-

tional characteristic data has shown it to be reliable (see Hughes et al., 2000), but no comprehensive psychometric analyses of the aggregate resident data are available. One further limitation of the data is that no prior notice is given when surveyors inspect facilities, but inspections are almost always conducted at 9- to 15-month intervals. This can give facilities the opportunity to prepare for the inspection and receive fewer deficiency citations. The data also do not contain potentially important variables for examining turnover such as staff wages and benefits.

The state sample was based on an AHCA data set that contains a large sample of facilities from all 50 states (Decker et al., 2003). The data may be limited, as AHCA members are likely to complete the survey in greater numbers than are nonmembers. If differences between ACHCA and non-AHCA members exist, then this may have introduced a bias into the state sample.

With the cross-sectional data used, it is not possible to disentangle causal direction. We hypothesize that eight organizational characteristics are associated with staff turnover. We cannot infer that these organizational characteristics necessarily cause staff turnover. Indeed, in some cases a plausible argument could be made that the causal direction may actually occur in the opposite direction. For example, low facility quality may cause higher staff turnover. However, the reverse may occur and low facility quality may result because of higher staff turnover; thus, our results should be interpreted as associations. Longitudinal data should be used in the future to determine the causal direction of the effects.

Finally, we also know that nursing home quality is a multidimensional construct, with a wide array of available quality indicators. Although we believe our quality indicator was appropriate, we cannot infer that our results are fully representative of nursing home quality. This limitation can be levied against all studies using a parsimonious set of nursing home quality indicators, including those involved with individual state report cards and the federal nursing home report card initiative (Nursing Home Compare). Moreover, some caution would be required in using several measures, because they are often not correlated with each other (Mor et al., 2003).

Conclusion

It is clear that the turnover rate for nursing home staff is high. The 1-year turnover rates identified in this study were 56.4%, 39.7%, and 35.8% for CNAs, LPNs, and RNs, respectively. This adds to a rather large body of research over the past 20 years also showing high rates of staff turnover. What is most important is that this study also shows that these rates are associated with several organizational characteristics, summarized in Table 3. Some differences are found in these associations based on the level of

turnover, although consistent support also is found for all nursing staff that lower staffing levels, lower quality, for-profit ownership, and higher bed size are associated with higher turnover. Some of these findings have implications for policy makers and practitioners, implying that higher staffing levels under consideration by federal and state policy makers may decrease staff turnover (Centers for Medicare and Medicaid Services [CMS], 2002). Also, policy makers' initiatives to improve quality (such as the use of Quality Improvement Organizations and Nursing Home Compare; see CMS, 2004) and practitioners' own initiatives to improve quality may benefit residents as intended, but these initiatives also benefit facilities themselves by decreasing the level of staff turnover.

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