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***The Mediating Role of Staffing on Quality of Care in Nonprofit
and For-Profit Nursing Homes in Indiana****

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ABSTRACT

This study attempts to disentangle the relationships between ownership, staffing, and nursing home quality using Indiana nursing home data. Typical Indiana nursing homes are known to be below average on health inspection and overall quality ratings. This is alarming because Indiana's population aged 85 years or older is increasing and these individuals are likely to need long-term care services. With an ultimate goal of addressing the poor quality of long-term care institutions, this study analyzed the Nursing Home Compare data collected from 2010 to 2012 by utilizing chi-square tests, one-way ANOVAs, and correlation analysis. The results revealed that nonprofit nursing homes have superior quality and record a greater number of registered nurse and certified nursing assistant hours per resident day compared to for-profit nursing homes. In addition, higher staffing hours were positively associated with overall rating. These findings imply a possibility that higher staffing levels in nonprofit nursing homes have a mediating effect on the relationship between ownership and nursing home quality. In order to improve nursing home quality, registered nurse and certified nursing assistant staffing levels need to be boosted. Enactment of state staffing standards and the Medicaid wage pass-through policy could help to address this issue.

KEY WORDS Nursing Home; Quality; Ownership; Staffing

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The U.S. Government Accountability Office (2009) reported that Indiana had the greatest number of “the most poorly performing” nursing homes in the country. With 52 such nursing homes out of a nationwide 580, the state is home to almost 9 percent of the total. The Centers for Medicare and Medicaid Services (CMS) also report that only about 10 percent of Indiana nursing homes have never been cited for health deficiencies (Demaree 2010). In addition, according to Nursing Home Compare (NHC) data collected from 2010 to 2012, more than 50 percent of Indiana nursing homes fall into the “below average” and “much below average” overall rating categories. This number is much greater than the national average of 31.3 percent (Abt Associates Inc. 2014).

The poor quality of nursing home care and higher volume of health deficiency citations are alarming given the rapid increase in demand for nursing home care. The number of Indiana residents aged 85 years or older, a demographic that is likely to need long-term care services, has been rapidly increasing in recent years, with a 26 percent rise from 2000 to 2010. To meet the health care needs of an aging population, the quality and performance of Indiana nursing homes should be improved. To explore potential policy remedies, this study will highlight the current quality problems of Indiana nursing homes and explore contributing factors such as ownership type and staffing hours to poor quality.

The next section will summarize a body of literature on nursing home quality itself, and the impact of ownership and staffing hours on nursing home quality. We will then introduce the data used in this study as well as the statistical methods utilized before presenting the results. We will conclude with policy suggestions and recommendations.

LITERATURE REVIEW

A number of studies have reported a great deal of across-facility variation in nursing home quality, but the most reliable measures of nursing home quality are unclear. Nursing home quality encompasses complex factors such as care practices, health outcomes for individual residents, and deficiency citations (Bowblis 2011). Frequency of care by staff members, patient care or dietary plan ratings, resident care or quality-of-life measures, and regulatory violations have all been used as various indicators of nursing home quality in previous studies, as have other patient-level quality indicators such as use of physical restraints, pressure ulcers, use of antipsychotics, and experiences of pain (Gottesman 1974; Mor et al. 2004; Nyman 1988a, 1988b). Even though studies have recently transitioned from using facility-level to patient-level quality measures (QMs), it is argued that correlations across QMs at the patient level are weak and sometimes conflict (Grabowski 2005). Overall, nursing home quality is difficult to assess (Bowblis 2011), and there is no single perfect measure.

The CMS launched NHC, a web-based nursing home report card, in 1998 with an expectation to improve nursing home quality by enhancing consumers’ information about the performance of nursing homes (Grabowski 2010). Regular inspections by state surveyors are important markers of the quality of care provided in nursing homes (Eaton

2005), and the NHC database compiles performance information on all federally certified Medicare and Medicaid nursing homes as a result of these inspections. This performance information includes staffing and deficiency ratings, the Minimum Data Set (MDS)-based QMs rating, and a composite measure of these three dimensions of quality (i.e., an overall rating; Grabowski 2010). As may be inferred, the overall rating is a multidimensional measure of nursing home quality. Considering its complexity, the overall rating can be preferred to the other three.

Previous studies have reported that nonprofit ownership is associated with higher staff hours per resident day (HPRD) (McGregor et al. 2005; Mueller et al. 2006; Park and Stearns 2009) and better nursing home quality (Ben-Ner and Ren 2008; Harrington et al. 2001; Park and Stearns 2009). This is likely because nonprofit nursing homes are more resident-oriented as a result of various tax subsidies and exemptions, in addition to the involvement of a limited number of stakeholders. Nonprofit nursing homes are therefore able to spend a larger proportion of their revenues on actual patient care than are for-profit homes (Grabowski and Stevenson 2008). Schlesinger and Gray (2006) found that nonprofit nursing homes provide services that are more efficient, cheaper, and more acceptable to Medicaid recipients and that this form of home is able to respond more flexibly to variations in community needs. This flexible nature is tied to the core principle of tailoring services to meet demand. Ben-Ner and Ren (2008) also claim that nonprofits and government-owned organizations are more likely to delegate decisions to employees than are for-profits, spurred by the decision-making vacuum created by fewer stakeholders. The increased trust placed in employees among nonprofits also creates a greater degree of autonomy, and the delegation of decision making to those who are working directly with the patients is thought to enhance the quality of care provided by nonprofit nursing homes (Ben-Ner and Ren 2008).

As a potential mediating factor on the relationship between ownership type and nursing home quality, staffing levels are believed to be a core factor in determining overall nursing home quality. A higher quality of care is more likely in homes with a greater number of staff. Registered nurses (RNs) and certified nursing assistants (CNAs) play a critical role within nursing homes, especially in the provision of direct care to residents. Higher RN staffing levels in particular are reported to be associated with better resident outcomes, as RNs are better able to apply their knowledge to the planning, assessment, and supervision of care (Decker 2008). It has also been demonstrated that RNs have a positive effect on residents' functioning and competence, and are associated with a lower number of deficiency citations (Harrington and Zimmerman 2000; Shin 2013). In comparison, CNAs provide over 80 percent of residents' total care within nursing homes (Pennington, Scott, and Magilvy 2003), which is why CNA HPRD is about three times higher than RN HPRD on average. CNAs assume many daily caring responsibilities, including feeding, bathing, dressing, and changing of bedding. CNAs not only facilitate daily living activities but also monitor residents' medical conditions. Because of their daily proximity with residents, CNAs play a pivotal role in observing changes in patients' physical conditions and the subtleties of their emotional states. All of these functions add to the quality of care in nursing homes. Previous studies have

reported that increased CNA staffing hours are associated with improved security among residents and a reduction in deficiency citations (Harrington and Zimmerman 2000; Kim et al. 2009; Park and Stearns 2009; Shin 2013).

DATA AND ANALYSIS

This study utilized data from the CMS's NHC database. The Five-Star Quality Rating System used by the CMS rates the performance of nursing homes across three domains—health inspection, staffing levels, and a set of QMs—along with an overall rating (hereafter, NHC quality domains; Abt Associates Inc. 2014). Health inspection ratings are based on the number, scope, and severity of deficiencies identified during the three most recent on-site annual health inspections. Certification surveys and inspections related to complaints lodged by residents and family members are also taken into account. Staffing ratings are based on the hours worked by RNs and on total nursing hours, calculated as the total HPRD of RNs, licensed practical nurses (LPNs), and CNAs (CMS 2012). To take into account the different levels of care needed by residents, staffing measures are adjusted to reflect the case mix of each facility. Quality ratings are based on various MDS QMs, including the percentage of residents who are physically restrained, demonstrate an increased need for help with daily activities, have catheters inserted, or suffer from pressure sores, urinary tract infections, severe pain, or major injuries. The overall rating is a composite of all three of these quality domains, but no specific weighting scale is applied (CMS 2012; Parenteau 2009). We believe that the overall rating is the most suitable quality indicator because it captures a multidimensional representation of nursing home quality. The NHC Five-Star Quality Rating System uses a five-point Likert scale ranging from 1 (“much below the average”) to 5 (“much above the average”).

In addition to the Five-Star Quality Rating System, the NHC website provides the structural characteristics of nursing facilities, such as ownership type and staffing hours. To explore differences in quality by ownership type and the potential mediating effect of staffing hours, data were extracted from the NHC database. Of the 510 federally certified Medicare and Medicaid nursing homes in Indiana, we evaluated 481 after eliminating 29 because of missing data. All nursing home information was collected between January 2010 and February 2012.

We used chi-square tests to explore quality differences by ownership type, one-way ANOVAs to investigate whether mean staffing HPRD differed by ownership type, and correlation analyses to examine the relationship between staffing hours and NHC quality domains in the 481 Indiana nursing homes. SPSS 22 was used for all data analysis.

DESCRIPTIVE STATISTICS

Fewer than half of the nursing homes assessed fell into the “above average” or “much above average” categories for health inspections (34 percent), staffing (41 percent), and overall rating (43 percent), whereas 53 percent of the nursing homes received an “above

average” or “much above average” QMs rating (see Table 1). In contrast, roughly 40 percent of the nursing homes were reported as either below average or much below average (a 1 or 2 rating) for health inspections, staffing, and overall rating. Only 18 percent, however, were found to be below average or much below average on the QMs ratings (Figure 1). These findings confirm that the majority of Indiana nursing homes perform poorly across three of the measures analyzed, most notably on the health inspection rating. Overall, the typical Indiana nursing home was seen as performing below average levels for health inspection and staffing ratings (rating < 3), even though the average overall rating was close to the average (rating = 3) and the QMs rating was slightly better than average (rating > 3; Figure 2).

Table 1. Descriptive Statistics: Ownership and NHC Quality Domains

Nursing Home Ownership Type	1	2	3	Total		
	For-Profit	Nonprofit	Government			
	N (%)	N (%)	N (%)			
	309 (64.2)	115 (23.9)	57 (11.9)	481 (100)		
NHC Quality Domains	1 Much below average	2 Below average	3 Average	4 Above average	5 Much above average	Total
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Health inspection rating	93 (19.3)	112 (23.3)	113 (23.5)	115 (23.9)	48 (10.0)	481 (100)
Staffing rating	72 (15.0)	111 (23.1)	99 (20.6)	166 (34.5)	33 (6.9)	481 (100)
QMs rating	26 (5.4)	58 (12.1)	141 (29.3)	174 (36.2)	82 (17.0)	481 (100)
Overall rating	73 (15.2)	98 (20.4)	103 (21.4)	133 (27.7)	74 (15.4)	481 (100)

Figure 1. Distribution of NHC Quality Domains



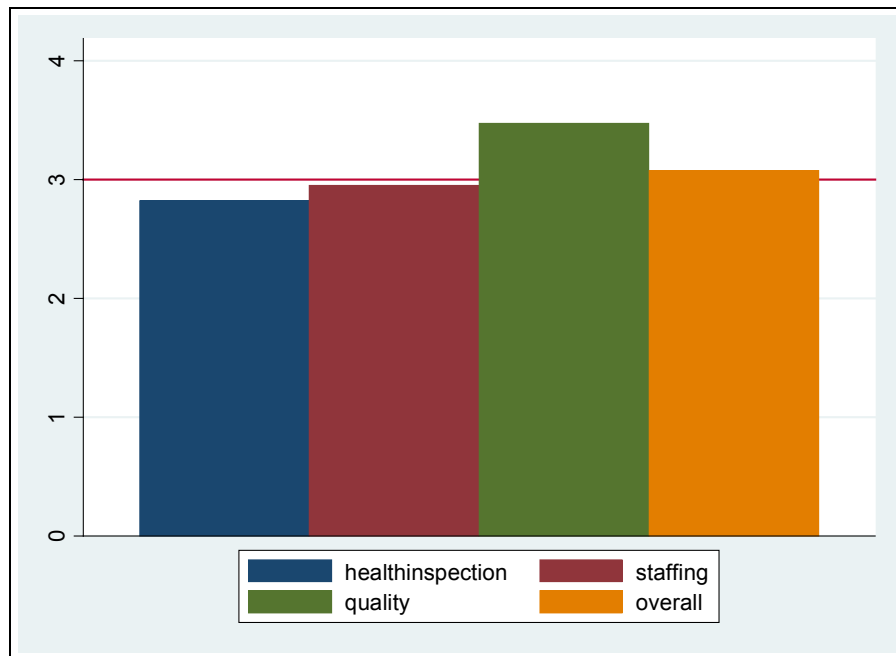
Notes: NHC=Nursing Home Compare.

5-point Likert scale on x-axis: 1 = much below average; 2 = below average; 3 = average; 4 = above average; 5 = much above average.

There were a greater number of for-profit nursing homes compared to nonprofit and government-owned nursing homes. As indicated in Table 1, 64 percent of Indiana nursing homes were for-profit, while only 24 percent and 12 percent were nonprofit and government-owned, respectively.

The average nursing staff HPRD was 44, 59, and 132 minutes for RNs, LPNs, and CNAs, respectively (see Table 2); however, the staffing hours varied substantially across nursing homes (SD > 20 minutes).

Figure 2. Mean Rating of the Four NHC Quality Domains



Notes: NHC=Nursing Home Compare.

5-point Likert scale on y-axis: 1 = much below average; 2 = below average; 3 = average; 4 = above average; 5 = much above average.

Table 2. Descriptive Statistics: Staffing Hours (Minutes)

	Mean (SD)	Min	Max	N
RN HPRD	44 (27)	14	272	481
LPN HPRD	59 (22)	0	196	481
CNA HPRD	132 (30)	26	272	481

Notes: HPRD=hours per resident day; CNA=certified nursing assistant; LPN=licensed practical nurse; RN=registered nurse.

RESULTS

First, the result of the chi-square test revealed that all NHC quality domains, with the exception of health inspection ratings, significantly differed by ownership type ($p < 0.001$; see Table 3). Nonprofit nursing homes had a much lower percentage of “belowaverage” or

“much below average” staffing and much lower overall ratings. Only 5.2 percent and 17.4 percent of nonprofit nursing homes obtained overall ratings of 1 or 2, respectively, whereas 16.5 percent and 21.4 percent of for-profit nursing homes reported such results. Likewise, 2.6 percent and 17.4 percent of nonprofit nursing homes were awarded a staffing rating of 1 or 2, respectively, whereas 17.2 percent and 24.9 percent of for-profit homes were graded as such in this category. In contrast, 58.3 percent and 66.1 percent of nonprofit nursing homes achieved “above average” or “much above average” ratings overall and for staffing, respectively, while this was true for only 40.5 percent and 35.9 percent of for-profit nursing homes. The QMs rating revealed somewhat different patterns. For-profit nursing homes had a higher percentage, with 59.6 percent graded as above average or much above average, whereas only 49.6 percent of nonprofit homes achieved such a rating. Government-owned nursing homes demonstrated inferior quality to both nonprofit and for-profit nursing homes across all three NHC quality domains, as seen in Table 3.

Second, given the superior quality of nonprofit over for-profit nursing homes as discussed above, we conducted one-way ANOVAs to explore whether staffing hours differed by ownership type. Staffing HPRD represented a continuous variable, while ownership type was a form of categorical data. These two variables were considered independent from each other. Because the data revealed some outliers, these observations were dropped from the analysis in order to meet normality assumptions.

The results of a series of one-way ANOVAs revealed that the average staffing HPRDs, not LPN but RN and CNA, differ by ownership type (Table 4). The mean RN HPRD significantly differed by ownership type [$F(2, 421) = 3.27 (p < 0.05)$]. Levene’s test statistics tell us that homogeneity of variance is not violated. Given this, Tukey’s Honestly Significance Difference test revealed that the mean differences between for-profits and nonprofits were statistically significant at the 0.05 significance level. The HPRD of RNs was 3.25 minutes higher within nonprofit nursing homes than within for-profit homes, with a 95% confidence interval [0.05, 6.45].

In addition, CNA HPRD was significantly greater in nonprofit nursing homes compared to in their for-profit counterparts [Levene’s statistic (2, 421) = 24.79 ($p < .001$); Welch statistic (2, 114.585) = 23.419 ($p < .001$)]. Given the unequal variance, the Games-Howell test showed that nonprofits have a higher CNA HPRD compared to for-profits by 16.4 minutes, with a 95% confidence interval [8.4, 24.5]. Nonprofits also demonstrated a higher CNA HPRD compared to government-owned homes, by 27 minutes, with a 95% confidence interval [17.7, 36.3]. No significant difference was found for LPN HPRD by ownership type, however. The box plots in Figure 3 depict the mean differences in nursing staffing hours by ownership type.

Third, correlation analysis revealed the presence of statistically significant relationships between nursing staff HPRD and NHC quality domains ($p < 0.01$; see Table 5). The HPRD of RNs and CNAs, but not of LPNs, were positively correlated with an overall rating, that is, the multidimensional measure of quality, even though the relationships were modest ($r = 0.3$). This positive relationship indicates that the overall rating of nursing homes increases as staffing levels increase. More specifically, a positive and significant but weak ($r \leq 0.2$) relationship was also found between the staffing levels of RNs and CNAs and health inspection ratings. In addition, the HPRD of RNs and CNAs were moderately correlated with staffing rating ($r = 0.5$ and $r = 0.6$, respectively), as expected. Interestingly, however, none of aforementioned variables demonstrated a statistically significant association with QMs rating. Overall, these results lead us to conclude that increased staffing levels of RNs and CNAs are associated with higher ratings in the NHC quality domains, as seen in Table 5.

Table 3. R results of Chi-Square Test between NHC Quality Domains and Nursing Home Ownership

NHC Quality Domains ^a	Overall Rating			Staffing Rating			QMs Rating		
	FP	NP	GOVT	FP	NP	GOVT	FP	NP	GOVT
1	51 16.50%	6 5.20%	16 28.10%	53 17.20%	3 2.60%	16 28.10%	13 4.20%	7 6.10%	6 10.50%
2	66 21.40%	20 17.40%	12 21.10%	77 24.90%	20 17.40%	14 24.60%	38 12.30%	13 11.30%	7 12.30%
3	67 21.70%	22 19.10%	14 24.60%	68 22.00%	16 13.90%	15 26.30%	74 23.90%	38 33.00%	29 50.90%
4	84 27.20%	37 32.20%	12 21.10%	101 32.70%	54 47.00%	11 19.30%	131 42.40%	33 28.70%	10 17.50%
5	41 13.30%	30 26.10%	3 5.30%	10 3.20%	22 19.10%	1 1.80%	53 17.20%	24 20.90%	5 8.80%
Total	309 100.00%	115 100.00%	57 100.00%	309 100.00%	115 100.00%	57 100.00%	309 100.00%	115 100.00%	57 100.00%
	Pearson Chi-Square = 30.36 (df = 8)***			Pearson Chi-Square = 67.68 (df = 8)***			Pearson Chi-Square = 30.21 (df = 8)***		

Notes: FP=for-profit; GOVT=government; NHC=Nursing Home Compare; NP=nonprofit; QMs=quality measures.

^a 5-point Likert scale: 1 = much below average; 2 = below average; 3 = average; 4 = above average; 5 = much above average.

*** p < .001

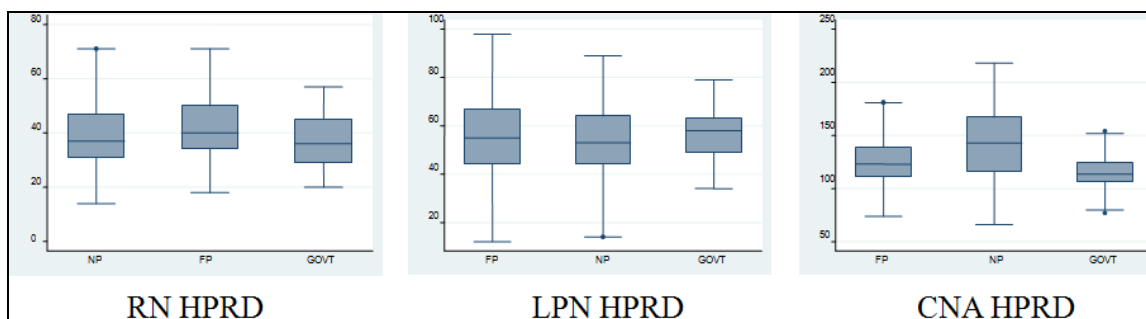
Table 4. Staffing Hours by Nursing Home Ownership

	For-profit (N=283)	Nonprofit (N=95)	Government-owned (N=46)
	Mean (SD) (HPRD in minutes)	Mean (SD) (HPRD in minutes)	Mean (SD) (HPRD in minutes)
RN*	39 (11)	42 (12)	38 (11)
LPN	56 (15.5)	54 (16)	56.6 (11)
CNA***	126 (21)	142 (30)	115 (16)

Notes: CNA=certified nursing assistant; HPRD=hours per resident day; LPN=licensed practical nurse; RN=registered nurse; SD=standard deviation.

* $p < .05$ *** $p < .001$

Figure 3. Box Plots of Nursing Staff HPRD by Ownership



Note: CNA=certified nursing assistant; FP=for-profit; GOVT=government-owned; HPRD=hours per resident day; LPN=licensed practical nurse; NP=nonprofit; RN=registered nurse.

Table 5. Correlation Coefficients among Quality Measures and Nursing Staff HPRD

	RN HPRD	LPN HPRD	CNA HPRD
Overall Rating	0.30***	0.06	0.30***
Health Inspection Rating	0.20***	-0.03	0.15**
Staffing Rating	0.47***	0.26***	0.57***
QMs Rating	-0.05	-0.06	-0.08

Notes: CNA=certified nursing assistant; HPRD=hours per resident per day; LPN=licensed practical nurse; QMs=quality measures; RN=registered nurse.

** $p < .01$ (two-tailed) *** $p < .001$ (two-tailed)

DISCUSSION AND CONCLUSION

The main finding of this study was that nonprofit nursing home ownership is significantly and positively associated with nursing home quality, especially overall rating. We postulate that the higher staffing levels found in nonprofit nursing homes, especially the HPRD of RNs and CNAs, explain the positive association between nonprofit ownership and nursing home quality. The HPRD of RNs and CNAs were 3.25 and 16.4 minutes higher, respectively, within nonprofit nursing homes than within for-profit nursing homes. Moreover, the HPRD of RNs and CNAs were positively associated with overall rating, demonstrating modest correlation coefficients. These findings are consistent with previous research that has revealed the existence of higher staffing levels and superior quality in nonprofit nursing homes (Konetzka, Stearns, and Park 2008; Park and Stearns 2009). As these studies have typically noted, the higher staffing levels found in nonprofit nursing homes could be the reason that these homes report fewer deficiencies, a factor that positively affects nursing home quality (McGregor et al. 2005).

Compared with the national average, Indiana nursing homes lag behind in the HPRD of both RNs and CNAs. The national average for RN and CNA HPRD is 47 and 147 minutes, respectively; in Indiana, these are only 44 and 132 minutes, respectively. This underachievement might be the reason why Indiana has the greatest number of the most poorly performing nursing homes in the country. The federal government enacted national standards ensuring that facilities have licensed nurses on duty 24 hours per day; an RN on duty at least eight consecutive hours per day, seven days per week; and a full-time RN director of nursing (Park and Stearns 2009). Following this enactment, several states introduced supplemental state standards; however, some states, including Indiana, have left the task of determining appropriate staffing levels to individual nursing homes. The results of this study imply that the establishment of appropriate staffing regulations at the state level is a more appropriate system, as higher staffing levels positively affect the process and outcome of health care in nursing homes. For instance, CNAs are directly entrusted with assisting residents with daily living activities, and so a reduction in the ratio of residents to CNAs may facilitate more one-on-one care, which is a significant factor in enhancing nursing home quality. A bill proposed by Indiana representative Clyde Kersey in 2010 made an effort to address staffing issues in nursing homes in the state. The proposition required nursing homes to provide one aide for every six residents during the day, and one aide for every nine residents during evening shifts (Indiana General Assembly 2013). Regrettably, the bill failed to garner legislative support. When considering that state staffing standards tend to increase staffing hours for facilities with below-average standards and are associated with a reduction in the number of total deficiencies across all types of facilities (Park and Stearns 2009), Indiana should set state minimum staffing standards in order to improve nursing home quality.

In addition, low CNA salaries are compounding the nursing home crisis in Indiana, as these result in high turnover rates. With an average annual salary of \$23,120, CNAs in Indiana are underpaid (Bureau of Labor Statistics 2012). Investing in programs to retain CNAs will be necessary to improve CNAs' job satisfaction and, subsequently, the quality of care they provide. The use of a wage pass-through policy, for instance,

which ties Medicaid reimbursement rates directly to staffing expenditures, may offer an effective solution. The Medicaid wage pass-through policy reserves a portion of Medicaid funds for the sole purpose of increasing compensation for direct-care workers, the majority of whom are CNAs working in long-term care (Zhanlian et al. 2010). Previous research has found that wage pass-through programs are likely to increase CNA wages, retention, and HPRD, and improve overall staffing levels (Miller et al. 2012; Zhanlian et al. 2010). In the state of Michigan, for example, the wage pass-through policy for nursing homes has been in place since 1990 and success in decreasing the turnover rates of CNAs has been reported (Zhanlian et al. 2010).

Implementation of the wage-pass through policy in Indiana would, however, be dependent on many factors. Given the current economic climate and its attendant effects on Medicaid funding, setting aside a portion of Medicaid funds could be problematic. Similarly, because 55.4 percent of Medicaid funds are already allocated to nursing homes in the state of Indiana (Kaiser Family Foundation 2012), allocation of more funds to the program would likely be met with great opposition. National research on wage pass-through success is limited by the scarcity of data and inadequate audits, which presents a challenge to the adoption of the policy (Miller et al. 2012; Zhanlian et al. 2010); however, the success in Michigan may propel Indiana policy makers' decision to adopt this proposal. In addition, the wage pass-through policy can be tailored to meet the needs of other nursing staff, such as RNs, and thus has the potential to increase the staffing hours of both RNs and CNAs to close to the national average, thereby improving nursing home quality.

In conclusion, this study finds that nonprofit ownership of nursing homes in Indiana has a positive relationship with both staffing hours and NHC quality domains. Nonprofit nursing homes have superior quality and record a greater number of RN and CNA HPRD compared to for-profit nursing homes. In addition, higher staffing hours were positively associated with the NHC quality domains. These findings imply a possibility that higher staffing levels in nonprofit nursing homes have a mediating effect on the relationship between ownership and nursing home quality. We therefore suggest that Indiana nursing home quality might be improved through the enhancement of RN and CNA staffing levels. To this end, we recommend that the state government enact and implement policy initiatives such as state staffing standards and the Medicaid wage pass-through policy. Unquestionably, it will not be an easy task to find a permanent solution to the current nursing home quality crisis. History has shown that political responses to health care crises in the United States are often calculative, slow, and unsuccessful. Nonetheless, not only Indiana but also other states will need to act quickly to prevent further reductions in quality of care for the elderly.

This study has limitations that can be addressed in future research. First, this study did not analyze the effects of nursing home structure, such as delegation, autonomy, and information asymmetry, on the making of policy. We have assumed that nonprofit nursing homes tailor their organizations to meet the needs of residents, thereby resulting in the demonstrated higher quality of nursing home care. Second, this study relied on bivariate analyses using Indiana nursing home data, which may limit the

generalizability of the findings. Much work remains for future research, including an exploration of the influence of additional factors that may affect nursing home quality, such as the payer mix and case mix. For example, the differences in funding for nonprofit, for-profit, and government-owned nursing facilities may influence the quality gap. Further research is necessary to understand how funding affects care, and whether this translates into differences in quality. Despite these limitations, this study will help policy makers within the state of Indiana recognize the quality gap between nonprofit and for-profit nursing homes and inform them of staffing regulations and policies that can help reduce this gap.

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