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Nursing Staff Characteristics on Resident Outcomes in Nursing Homes

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ABSTRACT

Background: The outlook of administrative staff and registered nurses (RNs) plays a critical role in the management of nursing homes. No previous study has compared the outcomes of nursing homes with RNs on staff with those of nursing homes without RNs on staff in Korea.

Purpose: The aim of this study was to investigate the association between nurse-led nursing homes, staff turnover, and resident outcomes in nursing homes in Korea.

Methods: Using a cross-sectional design, 36 nursing homes with 30 or more beds participated. Primary data included 15 quality indicators.

Results: Nursing homes with RNs had statistically significant better resident outcomes. RN turnover related positively to the prevalence of falls ($\beta = 1.68$, $p < .05$) and tube feeding ($\beta = 1.71$, $p < .01$) and negatively to incontinence ($\beta = -1.53$, $p < .01$). Nursing homes with RNs with tenures greater than 1 year had statistically significant lower prevalence of falls ($\beta = -0.47$, $p < .05$), incontinence ($\beta = -0.45$, $p < .05$), weight loss ($\beta = -0.53$ $p < .05$), and bed rest ($\beta = -0.54$, $p < .01$) and increased range of motion ($\beta = 0.51$, $p < .05$). Interestingly, having a nurse as a director for more than 1 year related negatively to the incidence of urinary tract infection ($\beta = -0.56$, $p < .05$) in residents. The rate of RN turnover was found to impact fall prevalence ($\beta = 1.68$, $p < .05$) and tube feeding ($\beta = 1.71$, $p < .01$) positively and to impact incontinence ($\beta = -1.53$, $p < .01$) negatively.

Conclusions: Turnover of nursing home staff and length of tenure may contribute to the more effective management of nursing homes, higher-quality long-term care insurance, and RN-staffing-related laws. Assessing staff characteristics and the tenure of employees promotes the effective management of nursing homes.

KEY WORDS:
nursing home, quality of care, administrator, nursing management.

Introduction

Emphases on quality and cost-effectiveness in the nursing home industry have increased, complicated by providing nursing care with diverse resident demands and limited resources worldwide (McGilton et al., 2016). The population share of older adults in Korea is estimated to rise to 37.4% by 2050 (Statistics Korea, 2013). To facilitate the care of older adults in professional institutions, the Korean government implemented long-term care insurance for older adults in July 2008 (Korean

Ministry of Health and Welfare, 2013). However, only 0.1% of registered nurses (RNs) in Korea work in nursing homes (Organisation for Economic Co-operation and Development, 2011). Most nursing homes in Korea employ alternative nurse staffs such as certified nurse aides because of the shortage of nurses and financial reasons. The Korean long-term care law requires nurse staffing as follows: one RN or certified nursing assistant (CNA) per 25 older adults (for nursing homes larger than 30 beds); one RN or CNA, one physical therapist, and one occupational therapist for 10- to 30-bed nursing homes; and one RN or CNA for nursing homes with less than 10 beds (Korean National Health Insurance Corporation, 2013). The scope of responsibilities of certified nurse aides is similar to that of licensed practical nurses (LPNs) in the United States, and the job scope of qualified care workers is equivalent to that of certified nurse aides in the United States (H. Y. Lee, Shin, & Harrington, 2015). The extensive body of literature worldwide on nurse staffing and outcomes includes a number of studies that support the contribution of RNs. However, no research to date has studied the relationship between nursing leadership position on resident outcomes.

Only a few studies have reported that nurse-led specific interventions effectively decreased medication errors (Blozik et al., 2010). In residential settings, nurse practitioners were shown to improve the management of chronic diseases (Neylon, 2015). However, no studies were identified in a search of the literature that addressed the relationship between administrative staff and resident outcomes in Korea.

The outlook of administrative staffs in nursing homes plays a critical role in developing a caring culture (Brannon, Kemper, Heier-Leitzell, & Stott, 2010) and achieving effective financial management (Lerner, Johantgen, Trinkoff, Storr, & Han, 2014). Consistent leadership contributes to efficient staffing and policymaking and the implementation of best nursing practices and high-quality care for residents (Krause,

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2012). The top manager in nursing homes usually includes administrators and directors of nurses (DONs). In the United States, each state has implemented a formal examination system for nursing home administrators (Siegel, Leo, Young, & Castle, 2014). In Korea, administrators are required to hold a social work certificate, in accordance with the Social Welfare Service Law and Medical Law, Article 2 (National Law Information Center, 2015). Nursing home administrators play critical roles in total management, human resource management, collaboration among staffs, providing care for residents with family members, and using community resources. The philosophy, attitudes, and leadership of administrators affect the general management and culture of the nursing home (G. H. Lee & Lee, 2012). Administrators' attitudes regarding culture change in long-term care settings are important. Moreover, the educational background of administrators, their management philosophy and beliefs, their attitudes toward person-centered care, and their perceptions on the importance of the physical environment, financial management, and staffing characteristics were statistically significant in the adoption of unit care in long-term care settings (G. H. Lee & Lee, 2012).

However, about 40% of administrators and DONs in the United States leave their positions within the first year (Executive Search Solutions, 2011). Moreover, the tenure of administrators differs based on proprietorship (profit or not for profit) and chain affiliations (Decker & Castle, 2009; Resnick, Manard, Stone, & Castle, 2009). DONs must have critical thinking skills in the decision-making process on a daily basis to achieve high-quality nursing care with very limited supplies and strict regulations (Siegel, Young, Zysberg, & Santillan, 2015). On the basis of the size of nursing homes, RNs and DONs may be employed in a single position or in two separate positions (Paek, Zhang, Wan, Unruh, & Meemon, 2016). DONs play very important roles in nursing homes because of their position between the structure (administrative role) and process (direct care nurse), as described in Donabedian's structure–process–outcome model (Siegel et al., 2015).

This study examines the importance of nurse staffing and turnover. The turnover of RNs and DONs is another factor that impacts resident outcomes. DON tenure stability has been positively associated with quality ratings (Krause, 2012) and Centers for Medicare and Medicaid's quality indicators (Rantz et al., 2004, 2003) and negatively associated with use of restraints (Anderson, Issel, & McDaniel, 2003) and immobility (Anderson et al., 2003) among residents. The turnover of nursing home administrators was shown to diminish quality outcomes but enhance resident outcomes (Castle & Lin, 2010). Furthermore, high rates of turnover of RNs have been correlated with poor resident outcomes, including increased numbers of residents on antidepressant medications, increased dehydration, and more bed rest (Castle & Anderson, 2011; Shin & Hyun, 2015). In addition, increased turnover of qualified care workers was found to relate positively with a lower prevalence of dehydration and

bed rest among residents (Shin & Hyun, 2015). Furthermore, having long-tenured nurses on staff has been correlated with better nursing home resident outcomes (Castle & Engberg, 2007). The increased turnover of DONs was associated with a lower proportion of residents with depression, whereas the high turnover of LPNs and CNAs had no statistically significant effect on resident outcomes in nursing homes (Castle & Anderson, 2011; Castle & Engberg, 2007). More research on the turnover of long-tenured staff in nursing homes is necessary in light of the limited number of relevant studies.

No study in the literature has compared resident outcomes in nursing homes with RNs with those in nursing homes without RNs in Korea. Thus, the purpose of this study was to investigate the association between nurse-led nursing homes, staff turnover, and resident outcomes in nursing homes. The hypotheses follow:

1. Nursing homes led by nurse administrators have better resident outcomes.
2. Nursing homes with RNs have better resident outcomes.
3. Nursing homes with DONs have better resident outcomes.
4. The rate of staff turnover relates to resident outcomes.
5. Tenure in the current position relates to resident outcomes.

Methods

Study Design

We used a descriptive cross-sectional design to evaluate, as dependent variables, the quality outcomes of 15 residents. We contacted by e-mail, by telephone, or in person all of the nursing homes in Korea in operation between 2014 and 2016 to invite their participation ($N = 1,332$) in this study. Ten percent of the nursing homes that indicated willingness to participate were randomly selected by computer. The principal investigator contacted about 130 nursing homes by e-mail and telephone, and 36 nursing homes were finally enrolled as participating institutions. These included only medium- and large-sized nursing homes (30 beds or larger, as evaluated by the Korean National Health Insurance Corporation, 2013). Every 3 years, the Korean Ministry of Health Welfare is mandated to evaluate nursing homes (Korean National Health Insurance Service, 2017). On the basis of this evaluation, an evaluation grade is assigned to each nursing home. Monetary incentives are provided to the top 20% of nursing homes, and an additional inspection is conducted on nursing homes that did not pass the evaluation (Korean National Health Insurance Service, 2017).

Data Sources

Information gathered included bed size, duration of operation, ownership characteristics, chain, religious affiliation of the establishment, referral hospitals, location (metropolitan or rural), current job tenure of administrators and DONs, and numbers of administrators who, respectively, hold a

nursing license, are DONs, and are RNs. All of the data were collected from primary sources because no published national data exist, and secondary data on nursing home staffing are not currently available from reliable sources (Kash, Castle, & Phillips, 2007).

Data were collected on the 15 core quality indicators related to resident outcomes that were developed by the Centers for Medicare and Medicaid in the United States and included in the 88 quality indicators of the Korean National Health Insurance Service (2017) nursing home evaluation manual (see Shin & Hyun, 2015, for details). As no official data exist on the turnover of nurse staffs, these data were collected using the American Health Care Association's (2011) Nursing Facility Staff Survey instrument.

Data Collection

A survey was used to collect the data. This survey was sent to all 1,332 nursing homes with 30 or more beds whose e-mail address was published on the long-term care insurance home page. Additional face-to-face or telephone meetings were held when requested. Approval from the institutional review board of a university in Korea was granted for this study (IRB no. 77-1).

Data Analysis

Multiple negative binomial regression was used to analyze the data. The independent variables were (a) RNs on staff/no RNs on staff, (b) DONs on staff/no DONs on staff, and (c) tenure and turnover of nursing staff. The dependent variables were the 15 quality indicators. To offset the limitations of using a cross-sectional design, we controlled heterogeneity between nursing homes as a fixed effect. Using a simple mixed-effects model for power analysis, a sample size of 36 was large enough to provide 75% power for the 15 fixed-effects dependent variables. The market characteristics of geographic location, ownership characteristics (profit vs. not for profit), market share, and size of facility were used as the control variables. The Herfindahl–Hirschman index (number of beds in an organization divided by the total number of beds in a province) was employed to control market competition characteristics (Paek et al., 2016). The long-term care insurance hierarchy (five stages) was used to adjust the case mix of residents statistically. This case mix was determined based on physical or mental competencies, cognitive status, behavior patterns, required nursing tasks, and rehabilitation (Korean National Health Insurance Service, 2017). SPSS Version 23.0 (IBM, Armonk, NY, USA) was used to identify variables with coefficients that satisfied p values below .05 and .1.

Results

Organizational Characteristics

The organizational characteristics of participating institutions are shown in Table 1. The average number of beds was 87.75

($SD = 13.24$, ranging from 9 to 296 beds). Average occupancy was high (93.35%, $SD = 11.43$%, ranging from 50.95% to 100%), and the average stay of residents was about 8 years and 5 months ($SD = 4.00$, ranging from 2 to 16 years). About 86.11% were operated as nonprofit organizations. More than half were located in small cities. Most (88.9%) did not have formal referral hospitals, and 32.43% had a religious affiliation. Approximately 46.53% of residents were third-grade, long-term care beneficiaries, who are partially dependent for activities of daily living.

Staff Characteristics and Outcomes

The results indicate that neither having a nurse as the administrator nor having multiple DONs impacted resident outcomes significantly. However, significantly better resident outcomes were identified in nursing homes with RNs in terms of the following variables: fewer falls ($\beta = 0.41$, $p < .05$), less cognitive impairment ($\beta = 0.45$, $p < .01$), less incontinence

TABLE 1.

Organizational Characteristics of 36 Nursing Homes

Demographic	Mean	SD
Number of beds	87.75	13.24
Occupancy rate (%)	93.35	11.43
Operation duration (years)	8.42	4.00
	n	**%**
Ownership form		
For profit	5	13.89
Not for profit	31	86.11
Location of organizations (population)		
Large metropolitan city (≥ 1 million)	11	30.56
Local small city (50,000–500,000)	22	61.11
Rural area (≤ 50,000)	3	8.33
Long-term care insurance[†]		
First[a]		14.63
Second[b]		28.33
Third[c]		46.53
Fourth[d]		9.39
Fifth[e]		0.00
Unrated		1.12
Chain of hospitals		
Yes	4	11.10
No	32	88.90
Religious affiliation		
Yes	11	32.43
No	25	67.57

[†]percentage of total sample; [a]Older adults who are completely dependent for activities of daily living. [b]Older adults who are mostly dependent for activities of daily living. [c]Older adults who are partially dependent for activities of daily living. [d]Older adults who have limited dependence for activities of daily living. [e]Older adults with dementia.

TABLE 2.
Staff Characteristics and Outcomes

Outcome	Administrator Led by Nurse		Director of Nursing		Registered Nurse		R^2	F
	β	p	β	p	β	p		
1. Fall prevalence	−0.18	.28	0.19	.25	0.41*	.02	.22	3.00*
2. Aggressive behavior	−0.11	.56	0.14	.45	0.17	.37	.05	0.64
3. Depression	0.03	.85	0.21	.24	0.21	.26	.11	1.34
4. Cognitive impairment	−0.12	.48	0.09	.61	0.45**	< .01	.21	2.75
5. Incontinence	−0.11	.52	0.09	.60	0.41*	.03	.17	2.25
6. Urinary tract infection	−0.14	.45	−0.17	.34	0.26	.17	.07	0.18
7. Weight loss	0.08	.67	0.25	.15	0.23	.20	.16	1.99
8. Dehydration	0.04	.81	0.22	.21	0.20	.28	.11	1.33
9. Tube feeding	−0.10	.56	0.11	.50	0.47**	< .01	.23	3.11*
10. Bed rest	−0.13	.41	0.25	.10	0.52**	< .01	.35	5.66**
11. Activities of daily living	−0.59	.14	0.43	.22	−0.13	.73	.48	1.86
12. Range of motion	0.10	.59	0.05	.78	0.29	.12	.12	1.44
13. Antidepressant or sleeping pills	0.14	.40	0.14	.38	0.36*	.04	.23	3.01*
14. Physically restrained	−0.29	.12	0.02	.93	0.32	.09	.13	1.49

Note. β = standardized coefficient.
*$p < .05$. **$p < . 01$.

($\beta = 0.41$, $p < .05$), less tube feeding ($\beta = 0.47$, $p < .01$), less bed rest ($\beta = 0.52$, $p < .01$), and fewer sleeping pills or antidepressants ($\beta = 0.36$, $p < .05$; Table 2).

Staff Turnover and Resident Outcomes
The ability of staff turnover to predict resident outcomes was also examined. As shown in Table 3, RN turnover

TABLE 3.
Staff Turnover and Resident Outcomes

Outcome	Registered Nurse Turnover		Care Worker Turnover		Social Worker Turnover	
	β	p	β	p	β	p
1. Fall prevalence	1.68*	.04	0.00	.99	0.06	.75
2. Aggressive behavior	0.74	.06	−0.12	.44	0.40*	.01
3. Depression	0.46	.35	−0.22	.19	−0.31	.19
4. Cognitive impairment	1.63	.07	−0.10	.54	0.04	.85
5. Incontinence	−1.53**	< .01	0.17	.18	0.01	.94
6. Urinary tract infection	0.03	.87	−0.23	.44	−0.02	.95
7. Weight loss	0.70	.10	−0.03	.78	−0.04	.82
8. Dehydration	−0.45	.58	−0.22	.33	−0.17	.60
9. Tube feeding	1.71**	< .01	−0.01	.93	−0.21	.23
10. Bed rest	1.33	.08	−0.09	.77	−0.28	.52
11. Activities of daily living			−0.85	.10		
12. Range of motion	0.13	.66	0.02	.83	−0.09	.51
13. Antidepressant or sleeping pills	−0.18	.77	−0.33	.13	−0.02	.90
14. Physically restrained	1.31	.13	0.12	.75	−0.22	.62

Note. β = standardized coefficient.
*$p < .05$. **$p < .01$. ***$p < .001$.

was found to relate positively to a lower prevalence of falls ($\beta = 1.68$, $p < .05$), less tube feeding ($\beta = 1.71$, $p < .01$), and less incontinence ($\beta = -1.53$, $p < .01$); administrative staff turnover was found to relate positively to depression ($\beta = 0.75$, $p < .05$), dehydration ($\beta = 1.02$, $p < .05$), range of motion ($\beta = 0.84$, $p < .01$), and use of antidepressant or sleeping pills ($\beta = 0.89$, $p < .01$); social worker turnover was found to relate positively to aggressive behavior ($\beta = 0.4$, $p = .01$); and dietician turnover was found to relate positively to prevalence of falls ($\beta = 1.12$, $p < .001$), aggressive behaviors ($\beta = 0.45$, $p < .05$), cognitive impairment ($\beta = 1.02$, $p < .01$), incontinence ($\beta = 0.99$, $p < .001$), weight loss ($\beta = 0.47$, $p < .05$), and tube feeding ($\beta = 1.24$, $p < .001$).

Staff Tenure and Resident Outcomes

Nursing homes with RNs with tenures of more than 1 year had statistically significant reductions in the prevalence of falls ($\beta = -0.47$, $p < .05$), incontinence ($\beta = -0.45$, $p < .05$), weight loss ($\beta = -0.53$ $p < .05$), and bed rest ($\beta = -0.54$, $p < .01$) and increases in range of motion ($\beta = 0.51$, $p < .05$). Interestingly, having a DON with a tenure of over 1 year was negatively associated with the incidence of urinary tract infections among residents ($\beta = -0.56$, $p < .05$). Moreover, nursing homes with social workers and RNs with a tenure of over 1 year had significantly lower aggressive behavior ($\beta = -0.54$, $p < .05$), depression ($\beta = -0.48$, $p < .05$), and weight loss ($\beta = -0.51$, $p < .01$), as shown in Table 4.

Discussion

This article tested staff characteristics and turnover, length of tenure of employees, and resident outcomes in nursing homes. This was the first study to examine the effects of nurse-led nursing homes, staffing of nurses, staff turnover, and resident outcomes in Korea. Unexpectedly, nursing leadership of nursing homes did not significantly affect resident outcomes. Previous research indicates that the management philosophy, the awareness of importance of staffing and finance, and the experience of managers improved resident outcomes in government-funded long-term care settings (G. H. Lee & Lee, 2012). Furthermore, the general management autonomy of administrators or DONs has been deemed to guarantee the achievement of effective management with optimal quality of care (G. H. Lee & Lee, 2012). Nursing leadership plays a crucial role in advancing quality of care. The positive nursing leadership of nurse administrators favorably influences working conditions and culture and may be employed to accomplish better patient outcomes (André, Sjøvold, Rannestad, & Ringdal, 2014). Chief nurse executives promote patient safety, patient-centered care, and cost-effective systems (Adams, Erickson, Jones, & Paulo, 2009). The results of this study are inconsistent with the results of prior research in that the nursing home administrators in this study did not impact nursing home outcomes. Thus, further research is necessary to confirm the effects of staff characteristics, especially focusing on the impact of nurse-led nursing homes on resident outcomes.

Dietitian Turnover		Cook Turnover		Administrative Staff Turnover			
β	p	β	p	β	p	R²	F
1.12***	< .001	−0.05	.75	−0.26	.21	.93	13.37**
0.45*	.040	−0.05	.79	0.35	.15	.91	9.67**
0.32	.130	0.32	.11	0.75*	.02	.90	8.56**
1.02**	.002	0.03	.87	−0.25	.33	.88	7.45*
0.99***	< .001	−0.04	.78	−0.01	.94	.94	16.56**
−0.04	.900	−0.01	.99	0.67	.16	.64	1.77
0.47*	.014	−0.04	.80	0.61*	.01	.94	16.37**
−0.22	.440	0.17	.53	1.02*	.02	.79	3.83
1.24***	< .001	0.16	.27	−0.88**	< .01	.94	16.43**
0.78	.070	−0.02	.96	0.04	.92	.64	1.76
		−0.01	.98			.64	1.97
−0.08	.600	0.15	.30	0.84**	< .01	.95	18.28***
−0.06	.840	−0.04	.88	0.89**	< .01	.83	4.80*
−0.28	.610	0.54	.26	−0.51	.38	.40	0.67

TABLE 4.
Staff Tenure and Resident Outcomes

Outcome	SEC β	DON β	NAD β	RN β	CW β	SW β
1. Fall prevalence	−0.22	0.20	0.18	−0.47*	−0.01	−0.26
2. Aggressive behavior	−0.02	−0.13	0.42*	0.26	0.03	−0.54*
3. Depression	−0.20	0.01	0.34	0.17	−0.01	−0.48*
4. Cognitive impairment	−0.07	−0.07	0.21	0.39	−0.05	−0.18
5. Incontinence	−0.12	−0.02	0.23	−0.45*	0.02	−0.26
6. Urinary tract infection	−0.05	−0.56*	−0.12	−0.05	−0.01	−0.12
7. Weight loss	−0.36*	0.19	0.40*	−0.53*	−0.23	−0.51**
8. Dehydration	−0.26	0.06	0.18	0.18	0.02	−0.40
9. Tube feeding	0.21	0.06	0.25	0.44	−0.13	0.21
10. Bed rest	−0.15	0.15	0.27	−0.54**	−0.10	0.12
11. ADL						
12. Range of motion	−0.34	−0.05	0.25	0.51*	0.07	−0.28
13. Antidepressant or sleeping pills	−0.04	−0.19	0.17	0.36	−0.05	−0.34
14. Physically restrained	0.03	−0.28	0.01	−0.02	−0.02	0.34

Note. SEC = executive secretary; DON = director of nurses; NAD = administrator led by nurse; RN = registered nurse; CW = care worker; SW = social worker; AS = administrative staff; ADL = activities of daily living; β = standardized coefficient.
*$p < .05$. **$p < .01$.

In this study, the effects of turnover on quality outcomes are quite consistent with those identified in previous studies. High turnover of RNs aligned with the prevalence of falls, tube feeding, and incontinence, and care worker turnover impacted tube feeding. In previous studies, stability in RN staffing (i.e., lower turnover) was significantly associated with decreased falls, decreased tube feeding, and decreased incontinence; higher CNA and licensed nurse turnover (RNs and LPNs) was significantly associated with low quality of care (Lerner et al., 2014); higher CNA turnover was significantly associated with more pressure ulcers, pain, and urinary tract infections (Trinkoff et al., 2013); and a high rate of turnover of qualified care workers reduced the prevalence of residents with dehydration and bed rest (Shin & Hyun, 2015).

The turnover of administrative staffs was found to relate to resident outcomes in this study. However, Harvey (2014) found no significant relationship between administrator turnover and patient outcomes. As the turnover of administrative and other staff has yielded complex results in many studies, additional research is necessary to clarify this relationship. In this study, the high turnover of social workers caused more tube feeding and dietician turnover aligned with a prevalence of falls, aggressive behaviors, cognitive impairment, weight loss, and tube feeding. However, no researchers have investigated the relationship between the turnover rate in other occupations (social workers, dieticians, and administrative staff) and nursing home resident outcomes. More research is needed to clarify the effect of staffs other than nurses on resident outcomes in nursing homes.

In particular, nursing homes that had RNs with over 1 year of tenure had better outcomes in terms of falls, incontinence, weight loss, bed rest, and range of motion, and those that had DONs with over 1 year of tenure exhibited a lower incidence of urinary tract infection. RNs are responsible for assessing major physical or psychological changes or symptoms and for cooperating with physicians for better treatment and care plans, whereas care that is provided by assistive personnel such as CNAs is nontechnical (Konetzka, Stearns, & Park, 2008). However, some nursing homes replace RNs with CNAs to decrease staffing costs. In addition, RNs are reluctant to work in nursing homes because of deficiencies in the working environment and insufficient benefits (Konetzka et al., 2008).

In Korea, nursing homes may employ RNs or CNAs interchangeably. For example, nursing homes must have at least one RN or CNA per 25 residents for 30 or more beds and one qualified care worker per 2.5 residents (Korean National Health Insurance Corporation, 2013). However, in the United States, the federal government and each state mandate specific requirements for nurse staffing in nursing homes, specifying direct and indirect care, number of licensed versus unlicensed staff, specific nursing staff numbers during mealtimes, and size of facilities (Harrington, 2005). In 2003, the Centers for Medicare and Medicaid Services recommended that nursing homes maintain a minimum staff of one RN, with increasing staffing levels with increased resident numbers (Harrington, 2005). We studied the effects of organization and nurse staff characteristics on resident outcomes in nursing homes. Legislative regulations for long-term care facilities in Korea did not reflect differences in each staff role and responsibility, direct

Dietitian	Cook	AS				
β	β	β	R^2	F	M	SD
0.01	0.20	0.12	.36	1.65	12.31	25.98
−0.23	0.36	0.35	.35	1.56	7.58	9.91
0.11	0.45	0.20	.40	1.96	10.01	17.22
0.08	0.25	0.17	.31	1.29	52.94	55.34
−0.01	0.26	0.14	.31	1.30	39.75	49.06
0.25	0.10	0.55	.29	1.16	2.36	5.32
−0.16	0.47*	0.07	.56	3.69**	4.11	10.08
0.21	0.35	0.18	.37	1.63	0.97	1.90
−0.12	0.03	0.06	.32	1.28	6.86	8.94
0.02	−0.06	0.35	.56	3.50**	16.29	12.86
−0.17	0.18	0.29	.37	1.65	1.99	3.77
0.07	0.50	0.25	.42	1.99	32.51	29.68
0.26	−0.25	0.44	.28	1.10	5.20	6.41

and indirect care, licensed versus unlicensed personnel, and any specific required timing such as mealtimes (Shin & Hyun, 2015).

Unorganized staff roles and duties lead to poor practice environments and overwork problems, causing discontent and high staff turnover (Maenhout & Vanhoucke, 2013). Nurse staffing is pivotal to the delivery of high-quality care. Many studies report a relationship between higher experienced RN staffing and lower adverse outcomes. Furthermore, legislative regulations that address the issue of optimal staffing are more effective when they specify more than numbers. Well-organized direct care staffs contribute to the development of quality of care (American Nurses Association, 2017). Thus, it is necessary to introduce policies on stable nurse staffing at nursing homes to enhance residents' quality of care.

Limitations

This study had some limitations. First, the issue of how DONs control and administer their staff and resources was not examined. Further research is needed to examine how nurse administrators and DONs actually operate and the effects of this on residents' quality-of-care outcomes. Second, as participating facilities are not representative of all nursing homes in Korea, generalizations should be made cautiously. Third, the 88 quality indicators that were developed by the Korean National Health Insurance Service (2017) were not fully measured, although very important issues such as elder abuse, communication with family members, counseling with residents, quality of food, transfer, staffing benefits, and appropriate reactions to emergency situations were raised.

Future research should consider a wider scope of quality measures. Last, the cross-sectional design used limits the validity of findings. Thus, more research is necessary to confirm the association between the nurse-led administration of nursing homes and resident outcomes.

Conclusions

This study examined using a cross-sectional approach the relationship between nurse-led nursing homes, staff turnover, length of tenure of employees, and resident outcomes. This was the first study to examine the relationship between nurse administrative staffing and resident outcomes in nursing homes in Korea. More research using representative sampling is required to confirm the influence of various administrative staff characteristics on resident outcomes.

Using large databases of administrative staff, future researchers may expand the current knowledge about the linkage between administrative staff characteristics and resident outcomes. In addition, accessible research materials on the effects of staff turnover and on resident outcomes are necessary for administrators or chiefs of nursing to create a more stable working environment in nursing homes (Lerner et al., 2014). Moreover, this study contributed to improving the quality of long-term care services for older adults. By assessing staff characteristics, turnover of nursing home staff, and tenure of employees, this study contributes to the more efficient management of nursing homes and to providing high-quality long-term care for older adults. Ultimately, this study contributes to enacting laws on stable staffing, especially with regard

to nurse staffing in nursing homes. This study may lead to improved quality of life for older adults who need support from the government and their families and improve the quality of the work environment of employees in nursing homes.

Acknowledgments

References

Adams, J. M., Erickson, J. I., Jones, D. A., & Paulo, L. (2009). An evidence-based structure for transformative nurse executive practice: The model of the interrelationship of leadership, environments, and outcomes for nurse executives (MILE ONE). *Nursing Administration Quarterly*, 33(4), 280–287. https://doi.org/10.1097/NAQ.0b013e3181b9dce3

American Health Care Association. (2011). *2011 Staffing survey report*. Retrieved from http://www.ahcancal.org/research_data/staffing/Documents/2011%20Staffing%20Survey%20Report.pdf

American Nurses Association. (2017). *Safe staffing literature review*. Retrieved from http://nursingworld.org/SafeStaffing-LiteratureReview

Anderson, R. A., Issel, L. M., & McDaniel, R. R., Jr. (2003). Nursing homes as complex adaptive systems: Relationship between management practice and resident outcomes. *Nursing Research*, 52(2), 12–21. https://doi.org/10.1097/00006199-200301000-00003

André, B., Sjøvold, E., Rannestad, T., & Ringdal, G. I. (2014). The impact of work culture on quality of care in nursing homes—A review study. *Scandinavian Journal of Caring Sciences*, 28(3), 449–457. https://doi.org/10.1111/scs.12086

Blozik, E., Born, A. M., Stuck, A. E., Benninger, U., Gillmann, G., & Clough-Gorr, K. M. (2010). Reduction of inappropriate medications among older nursing-home residents: A nurse-led, pre/post-design, intervention study. *Drugs & Aging*, 27(2), 1009–1017. https://doi.org/10.2165/11584770-000000000-00000

Brannon, S. D., Kemper, P., Heier-Leitzell, B., & Stott, A. (2010). Reinventing management practices in long-term care: How cultural evolution can affect workforce recruitment and retention. *Generations*, 34(4), 68–74.

Castle, N. G., & Anderson, R. A. (2011). Caregiver staffing in nursing homes and their influence on quality of care: Using dynamic panel estimation methods. *Medical Care*, 49(6), 545–552. https://doi.org/10.1097/MLR.0b013e31820fbca9

Castle, N. G., & Engberg, J. (2007). The influence of staffing characteristics on quality of care in nursing homes. *Health Services Research*, 42(5), 1822–1847. https://doi.org/10.1111/j.1475-6773.2007.00704.x

Castle, N. G., & Lin, M. (2010). Top management turnover and quality in nursing homes. *Health Care Management Review*, 35(2), 161–174. https://doi.org/10.1097/HMR.0b013e3181c22bcb

Decker, F. H., & Castle, N. G. (2009). The relationship of education level to the job tenure of nursing home administrators and directors of nursing. *Health Care Management Review*, 34(2), 152–160. https://doi.org/10.1097/HMR.0b013e31819ea7f7

Executive Search Solutions. (2011). *Leadership turnover in long term care*. Retrieved from http://www.essusa.net/pdf/NURSINGHOMELEADERSHIPTURNOVERESSWhitePaperFinal.pdf

Harrington, C. (2005). Nurse staffing in nursing homes in the United States: Part II. *Journal of Gerontological Nursing*, 31(3), 9–15. https://doi.org/10.3928/0098-9134-20050301-05

Harvey, D. W. (2014). *Nursing home administrator turnover and quality of care: A quantitative study* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (UMI No. 3583305)

Kash, B. A., Castle, N. G., & Phillips, C. D. (2007). Nursing home spending, staffing, and turnover. *Health Care Management Review*, 32(3), 253–262. https://doi.org/10.1097/01.HMR.0000281625.20740.13

Konetzka, R. T., Stearns, S. C., & Park, J. (2008). The staffing-outcomes relationship in nursing homes. *Health Services Research*, 43(3), 1025–1042. https://doi.org/10.1111/j.1475-6773.2007.00803.x

Korean Ministry of Health and Welfare. (2013). *Medical law*. Retrieved from http://www.law.go.kr/DRF/lawService.do?OC=lrzh&target=law&MST=107499&type=HTML (Original work published in Korean)

Korean National Health Insurance Corporation. (2013). *Long term care insurance statistics* (no. 11-B550928-000038-09). Retrieved from http://khiss.go.kr/board/bbs_seq=367&bbsid=B301&tname=MINBOARD358 (Original work published in Korean)

Korean National Health Insurance Service. (2017). *Judgment rating for long-term care insurance*. Retrieved from http://www.nhis.or.kr/bbs7/boards/B0039/17025 (Original work published in Korean)

Krause, M. R. (2012). Director of nursing current job tenure and past experience and quality of care in nursing homes. *Health Care Management Review*, 37(1), 98–108. https://doi.org/10.1097/HMR.0b013e318222429a

Lee, G. H., & Lee, J. M. (2012). Impact of facility managers' characteristics on their intention to introduce a unit care system. *Health and Social Welfare Review*, 32(4), 94–122. https://doi.org/10.15709/hswr.2012.32.4.94

Lee, H. Y., Shin, J. H., & Harrington, C. (2015). Comparing the nurse staffing in Korean and U.S. nursing homes. *Nursing Outlook*, 63(2), 137–143. https://doi.org/10.1016/j.outlook.2014.08.005

Lerner, N. B., Johantgen, M., Trinkoff, A. M., Storr, C. L., & Han, K. (2014). Are nursing home survey deficiencies higher in facilities with greater staff turnover. *Journal of the American Medical Directors Association*, 15(2), 102–107. https://doi.org/10.1016/j.jamda.2013.09.003

Maenhout, B., & Vanhoucke, M. (2013). An integrated nurse staffing and scheduling analysis for longer-term nursing staff allocation problems. *Omega*, 41(2), 485–499. https://doi.org/10.1016/j.omega.2012.01.002

McGilton, K. S., Bowers, B. J., Heath, H., Shannon, K., Dellefield, M. E., Prentice, D., … Mueller, C. A. (2016). Recommendations from the International consortium on professional nursing practice

in long-term care homes. *Journal of the American Medical Directors Association*, *17*(2), 99–103. https://doi.org/10.1016/j.jamda.2015.11.001

National Law Information Center. (2015). *Welfare of the Aged Act Article 22-1*. Retrieved from http://www.law.go.kr/lsInfoP.do?lsiSeq=178901&efYd=20160101#AJAX (Original work published in Korean)

Neylon, J. (2015). Nurse-led management of chronic disease in a residential care setting. *Nursing Older People*, *27*(9), 22–26. https://doi.org/10.7748/nop.27.9.22.s18

Organisation for Economic Co-operation and Development. (2011). *Help wanted? Providing and paying for long-term care*. Retrieved from http://www.oecd.org/health/health-systems/help-wanted-9789264097759-en.htm

Paek, S. C., Zhang, N. J., Wan, T. T., Unruh, L. Y., & Meemon, N. (2016). The impact of state nursing home staffing standards on nurse staffing levels. *Medical Care Research and Review*, *73*(1), 41–61. https://doi.org/10.1177/1077558715594733

Rantz, M. J., Hicks, L., Grando, V., Petroski, G. F., Madsen, R. W., Mehr, D. R., … Maas, M. (2004). Nursing home quality, cost, staffing, and staff mix. *The Gerontologist*, *44*(1), 24–38. https://doi.org/10.1093/geront/44.1.24

Rantz, M. J., Vogelsmeier, A., Manion, P., Minner, D., Markway, B., Conn, V., … Mehr, D. R. (2003). Statewide strategy to improve quality of care in nursing facilities. *The Gerontologist*, *43*(2), 248–258. https://doi.org/10.1093/geront/43.2.248

Resnick, H. E., Manard, B., Stone, R. I., & Castle, N. G. (2009). Tenure, certification, and education of nursing home administrators, medical directors, and directors of nursing in for-profit and not-for-profit nursing homes: United States 2004. *Journal of the American Medical Directors Association*, *10*(6), 423–430. https://doi.org/10.1016/j.jamda.2009.03.009

Shin, J. H., & Hyun, T. K. (2015). Nurse staffing and quality of care of nursing home residents in Korea. *Journal of Nursing Scholarship*, *47*(6), 555–564. https://doi.org/10.1111/jnu.12166

Siegel, E. O., Leo, M. C., Young, H. M., & Castle, N. G. (2014). Nursing home administrator self-assessed preparedness. *Health Care Management Review*, *39*(3), 210–222. https://doi.org/10.1097/HMR.0b013e318294e5ce

Siegel, E. O., Young, H. M., Zysberg, L., & Santillan, V. (2015). Securing and managing nursing home resources: Director of nursing tactics. *The Gerontologist*, *55*(5), 748–759. https://doi.org/10.1093/geront/gnu003

Statistics Korea. (2013). *Estimated future population*. Retrieved from http://meta.narastat.kr/metasvc/svc/SvcMetaDcDtaPopup.do?orgId=101&confmNo=10133&kosisYn=Y (Original work published in Korean)

Trinkoff, A. M., Han, K., Storr, C. L., Lerner, N., Johantgen, M., & Gartrell, K. (2013). Turnover, staffing, skill mix, and resident outcomes in a national sample of US nursing homes. *JONA: Journal of Nursing Administration*, *43*(12), 630–636. https://doi.org/10.1097/NNA.0000000000000004