Effects of nursing leadership on nurse burnout and care quality: A structural equation modeling analysis

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- Delivering high quality of care is essential to creating trusty health services, which prevent human suffering and ensure healthier societies and economies.
- As nurses are the main care providers, it is important to establish and sustain a health professional nursing workforce with the capacity and capability to meet the demands and needs of the population for high-quality care.

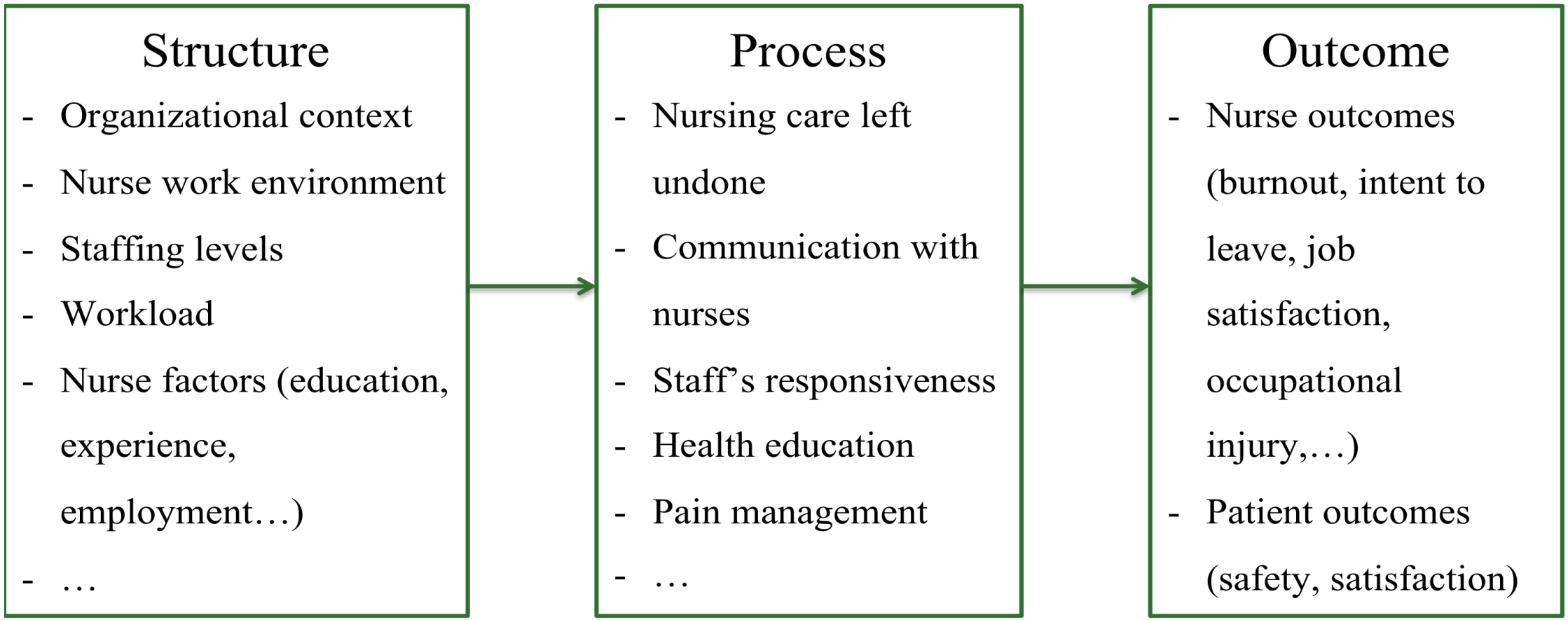
CHINESE HOSPITAL NURSING WORKFORCE STUDY

2009
-181 hospitals across mainland China;
-9698 nurses & 6494 patients.

2014
-23 hospitals across Guangdong province;
-2066 nurses & 1334 patients.

2018
-36 hospitals across Guangdong province;
-4833 nurses & 2180 patients.

THEORETICAL FRAMEWORK



(Donabedian, 1988)

STRUCTURE----NURSE OUTCOMES

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RESEARCH ARTICLE

WILEY RESEARCH IN NURSING & HEALTH

The associations of occupational hazards and injuries with work environments and overtime for nurses in China

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ABSTRACT

Occupational hazards (OHs) and occupational injuries (OIs) may contribute to nurses needing sick time and to a high financial burden for hospitals. There is little published literature about nurse-reported OHs/OIs and their relationships with work environments and working overtime in China. This study was designed to describe Chinese hospital registered nurses' OHs/OIs and to explore the associations between work environments, working overtime, and nurse-reported OHs/OIs. This cross-sectional study was conducted in Guangdong province in China in 2014. The sample included 1,517 nurses from 111 medical/surgical units in 23 hospitals. The Practice Environment Scale of the Nursing Work Index was used to measure work environment. Overtime was calculated by subtracting scheduled work hours from actual work hours. Six items were used to measure nurse-reported OHs/OIs. Descriptive statistics, Chi-square tests, and two-level logistic regression models were used to analyze the data. The percentages of nurses reporting OHs/OIs occurred in the year before the survey ranged from 47% to 80%. Nurses who worked in good (vs. poor) unit work environments were less likely to experience OHs/OIs (Odds ratio [OR] = 0.65–0.68, $p < .05$). Nurses who worked overtime (OR = 1.19–1.33, $p < .05$) and in Level 3 (largest) hospitals (OR = 1.45–1.80, $p < .05$) were more likely to experience OHs/OIs. We found that OHs/OIs were prevalent among hospital nurses in China. Better work environment and less nurse overtime were associated with fewer nurse OHs/OIs.

KEYWORDS
China, hospital nurse, occupational hazard, occupational injury, overtime, work environment

1 | INTRODUCTION

Nurses are the largest workforce of healthcare professionals at the front-line in hospitals. They have frequent and prolonged contact with patients as they provide direct care (National Health and Family Planning Commission of China, 2016). In their work hospital nurses are exposed daily to a variety of occupational hazards (OHs) and occupational injuries (OIs). This exposure can lead to nurses needing to take sick time (Geiger-Brown & Lipscomb, 2010; Lin & Juan, 2015) and to a high financial burden for hospitals (McCaughey et al., 2016).

OHs are defined as workplace situations that have the potential to cause injury or adverse health effects (Safeopedia, 2017). Injuries are mechanical disruptions of tissue resulting in pain. OIs are injuries that occur at work, and OHs have the potential to cause OIs (Dyrkacz, Mak, & Heck, 2012). Because OHs and OIs are closely related to each other,

Yan Wu and Jing Zheng should be considered joint first author.

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The Association of Chinese Hospital Work Environment with Nurse Burnout, Job Satisfaction, and Intention to Leave

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Abstract

The purpose of this study was to describe nurse burnout, job satisfaction, and intention to leave, and to explore the relationship of work environment to nurse outcomes in a sample of 9,698 nurses

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STRUCTURE----PATIENT OUTCOMES

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The relationship between patient safety culture and adverse events: A questionnaire survey

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Hospital nursing, care quality, and patient satisfaction: Cross-sectional surveys of nurses and patients in hospitals in China and Europe

Li-ming You[a], Linda H. Aiken[b,*], Douglas M. Sloane[b], Ke Liu[a], Guo-ping He[c], Yan Hu[d], Xiao-lian Jiang[e], Xiao-han Li[f], Xiao-mei Li[g], Hua-ping Liu[h], Shao-mei Shang[i], Ann Kutney-Lee[b], Walter Sermeus[j]

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HEALTH POLICY AND SYSTEMS

Nurse Staffing Levels Make a Difference on Patient Outcomes: A Multisite Study in Chinese Hospitals

Xiao-wen Zhu, BSN[1], Li-ming You, MSN, RN[2], Jing Zheng, PhD, RN[3], Ke Liu, PhD, RN[4], Jin-bo Fang, PhD, RN[5], Shu-xiao Hou, MSN, RN[6], Min-min Lu, MSN, RN[7], Ai-li Lv, PhD, RN[8], Wei-guang Ma, MSN, RN[9], Hong-hong Wang, PhD, RN[10], Zi-jing Wu, MSN, RN[11], & Li-feng Zhang, RN[12]

Shang et al. Human Resources for Health 2014, 12:1
http://www.human-resources-health.com/content/12/1/1

HUMAN RESOURCES FOR HEALTH

RESEARCH Open Access

Nurse employment contracts in Chinese hospitals: impact of inequitable benefit structures on nurse and patient satisfaction

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Effects of Work Environment on Quality of Care in ICUs

A Multisite Survey in China

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STRUCTURE—PROCESS—(NURSE OUTCOMES)—PATIENT OUTCOMES

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Hospital nursing organizational factors, nursing care left undone, and nurse burnout as predictors of patient safety: A structural equation modeling analysis

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Patient safety
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Workload
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ABSTRACT

Background: Promotion of patient safety is among the most important goals and challenges of healthcare systems worldwide in countries including China. Donabedian's Structure-Process-Outcome model implies that patient safety is affected by hospital nursing organizational factors and nursing care process. However, studies are imperative for a closer understanding about the mechanisms by which patient safety is affected to guide practice.
Objective: The objective of this study was to explore the impact of hospital nursing work environment, workload, nursing care left undone, and nurse burnout on patient safety.
Design: This was a cross-sectional study conducted in 23 hospitals in Guangdong province, China in 2014. Data from nurses (n = 1542) responsible for direct care on 111 randomly sampled medical and surgical units were analyzed.
Methods: Work environment was measured by the Practice Environment Scale of Nursing Work Index. Workload was measured by day shift unit patient-nurse ratio and non-professional tasks conducted by nurses. Nursing care left undone was measured by 12 items addressing necessary nursing activities. Nurse burnout was measured by the emotional exhaustion subscale of the Maslach Burnout Inventory-Human Services Survey. Patient safety was measured by three items indicating nurses' perception of overall patient safety and nine items addressing patient adverse events. Structural equation modeling was used to examine a hypothesized model that supposed work environment and workload have both direct and indirect effects on patient safety through nursing care left undone and nurse burnout.
Results: The findings generally supported the hypothesized model. Better work environment was associated with better patient safety both directly and indirectly. Lower workload primarily indirectly related to better patient safety. Nursing care left undone and nurse burnout were mediators negatively associated with patient safety.
Conclusions: Improving work environment, increasing nurse staffing levels, and providing sufficient support for nurses to spend more time on direct patient care would be beneficial to patient safety improvement.

What is already known about the topic?

- International studies have shown links between better work environments, lower nurses' workload, and better patient safety.
- Nursing care left undone and nurse burnout, which represent nursing care process and nurse outcome, have been related to poor patient safety.
- Evidence is limited about the mechanisms that underlie the relationships among hospital nursing organizational factors, nursing care left undone, nurse burnout, and patient safety, especially in China.

What this paper adds

- This study is one of the first to provide preliminary support for a comprehensive model taking factors related to hospital nursing organization, process, nurse outcome, and patient safety into consideration simultaneously.
- Work environments were positively associated with patient safety directly and indirectly. Lower nurses' workload was indirectly

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Association of Nurse Education Level and Nurse Staffing With Hospitalized Patient Perception of Hospital Care

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Objective

To examine the associations between unit nurse education level, unit nurse staffing, and hospitalized patient perception of hospital care in Guangdong province, China.

Methods

- **Design**: A cross-sectional study.

- **Measures**:
a) Hospitalized patient perception of hospital care was measured by Hospital Consumer Assessment of Healthcare Providers and Systems Scale.
b) Unit nurse education level was measured by the proportion of nurses holding a baccalaureate or higher degree on the unit.
c) Unit nurse staffing was measured by the nurse-patient ratio (dividing unit nurse number by average patient number reported by nurses on the unit) at unit level.

- **Data Analysis**: Structural equation modeling analysis (variables controlling: hospital level, unit nursing practice work environment, unit type, unit nurses' average age, and patient age, gender, education level, health status, and length of stay) .

Samples and Setting

Nurses (n=1,582) responsible for direct care and randomly sampled patients (n=1,330) who were aged 14 years and above had been hospitalized for at least 3 days on 111 medical and surgical units from 23 hospitals in Guangdong, China in 2014.

Table 1 Hospital and unit characteristics.

Characteristics	n (%)	Characteristics	n (%)
Hospital level (n=23)		Unit nurse-patient ratio [a] (n=111)	
Level 3 (major hospitals)	12 (52.2)	.2-	28 (25.2)
Level 2 (medium size hospitals)	11 (47.8)	.3-	39 (35.2)
Unit type (n=111)		.4-	30 (27.0)
Medical	58 (52.3)	.5-.8	14 (12.6)
Surgical	53 (47.7)	Unit proportion of nurses with baccalaureate and	
Unit nurses' average years		higher degree [b] (%; n=111)	
working in nursing [a] (n=111)		.0-	32 (28.8)
1.0-	32 (28.8)	25.0-	43 (38.8)
5.0-	63 (56.8)	50.0-	29 (26.1)
10.0-13.6	16 (14.4)	75.0-100.0	7 (6.3)
Unit nurses' average age [b] (n=111)			$\bar{x} \pm s$
22.9-	20 (18.0)	Unit nursing practice environment	3.14± .27
25.0-	74 (66.7)	(n=111)	
30.0-35.1	17 (15.3)		

Note: [a] Nurses' average years working in nursing of all units was 6.65±2.74; [b] Nurses' average age of all units was 27.49±2.67; [c] The average nurse-patient ratio of all units was .38±.12; [d] The average proportion of nurses with baccalaureate and higher degrees of all units was 28.85±23.28(%).

Table 2 Patient characteristics [(N=1,330; n (%))][a]

Characteristics		Characteristics	
Age (years; n=1,322) [b]		Health status (n=1,310)	
14-	42 (3.2)	Excellent	43 (3.4)
28-	274 (20.7)	Very good	286 (21.8)
48-	459 (34.7)	Good	516 (39.1)
68-	443 (33.5)	Fair	370 (28.2)
88-99	104 (7.9)	Poor	99 (7.5)
Gender (n=1,321)		Education level (n=1,319)	
Female	640 (48.4)	No schooling	136 (10.3)
Length of stay (days; n=1,315) [c]		Primary school	368 (27.9)
5-	703 (53.5)	Junior high school	380 (28.8)
8-	354 (27.0)	Senior high school	258 (19.6)
15-	135 (10.3)	College and higher	177 (13.4)
22-364	121 (9.2)		

Note: [a] Sample size for different characteristics varied because of missing data. [b] Patients were 53.41 ± 18.38 years old on average. [c] Patients' length of stay was the inpatient days by the time of study. Patients' average length of stay was 11.30 ± 17.57days, with a median (P_{25}, P_{75}) of 7.00 (4.00, 12.00) days.

Results

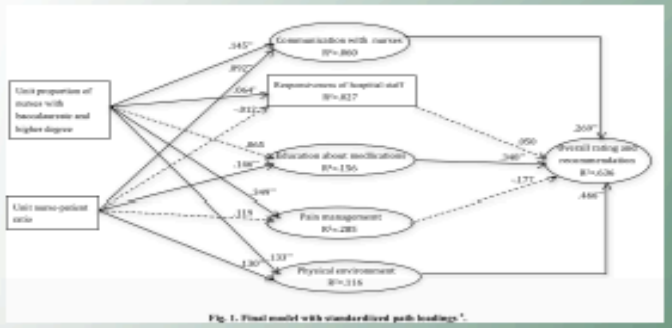

Fig. 1. Final model with standardized path loadings [a].

The model fit data well [CFI=.947, TLI=.903, SRMR=.033, and RMSEA=.030 (90%CI:.025-.036)].

Conclusions

Increasing nurse staffing and upgrading nurses' education level may be potentially helpful to improve patient perception of hospital care.

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What is already known?

- Nurses were less likely to report poor nurse outcomes such as burnout and poor quality of care in hospitals with better hospital organizational structures.
- Nursing work environment seems to be one of the most important hospital organizational structures.
- Nursing leadership is critical in creating a positive and supportive work environment.

AIM OF THIS STUDY

- To explore the impact of nursing leadership on nurse burnout and quality of care.

CONTENT

1 METHOD

- A cross-sectional study in 2014.
- Nurses (N=1579) responsible for direct care on medical and surgical units.
- Measures:

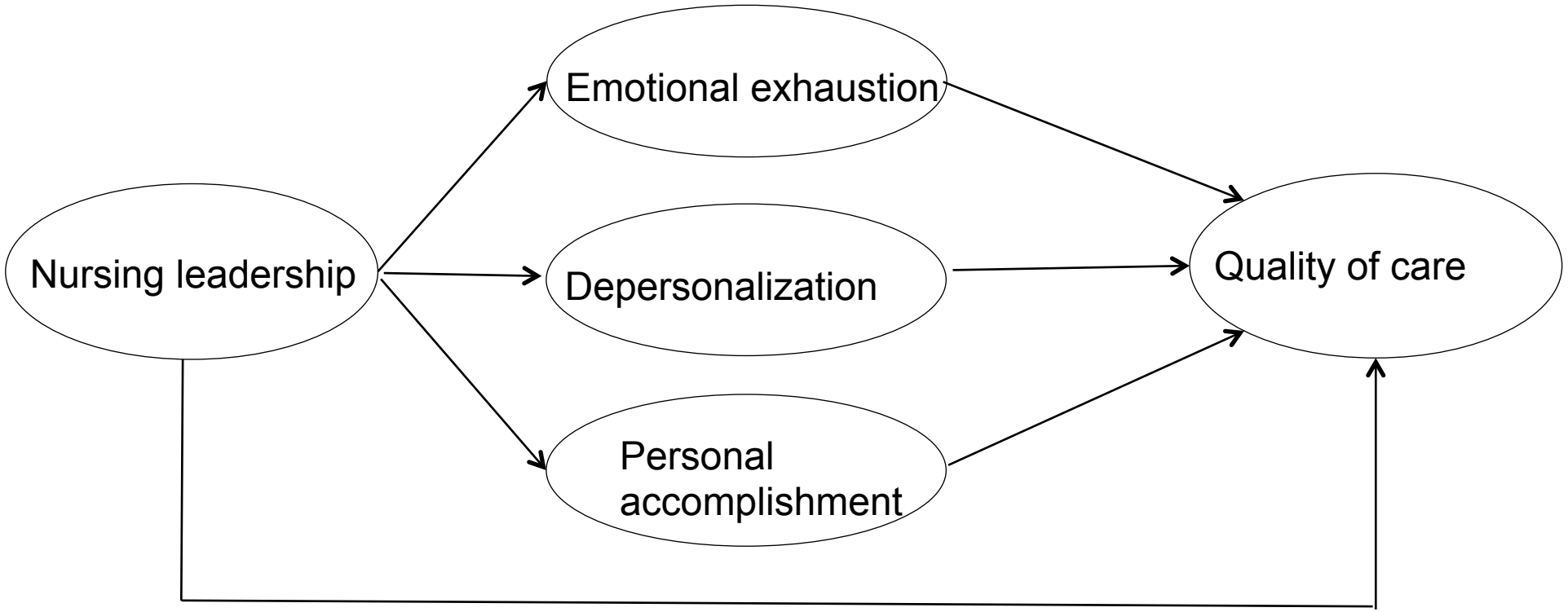
  - Nursing leadership: Nurse Manager Ability, Leadership, and Support Subscale of the Practice Environment Scale of Nursing Work Index

  - Nurse burnout: Maslach Burnout Inventory-Human Services Survey

  - Quality of care: three independent items indicating nurses' perception of overall quality of care

1 METHOD

- Structural equation modeling analysis.



Hypothesized model

2 FINDINGS

Table 1 Nurses Demographic Characteristics (*N*= 1579)[a].

Characteristics	*n* (%)	Characteristics	*n* (%)
Gender (female)	1491 (98.9)	Age	
Working years in nursing		18-	612 (39.9)
<5	773 (51.8)	25-	466 (30.3)
5-	340 (22.8)	30-	244 (15.9)
10-	177 (11.8)	35-	106 (6.9)
15-	92 (6.2)	40-54	107 (7.0)
20-34	110 (7.4)	Education level	
		Secondary diploma	184 (11.9)
		Advanced diploma	736 (47.7)
		Baccalaureate degree and higher	624 (40.4)

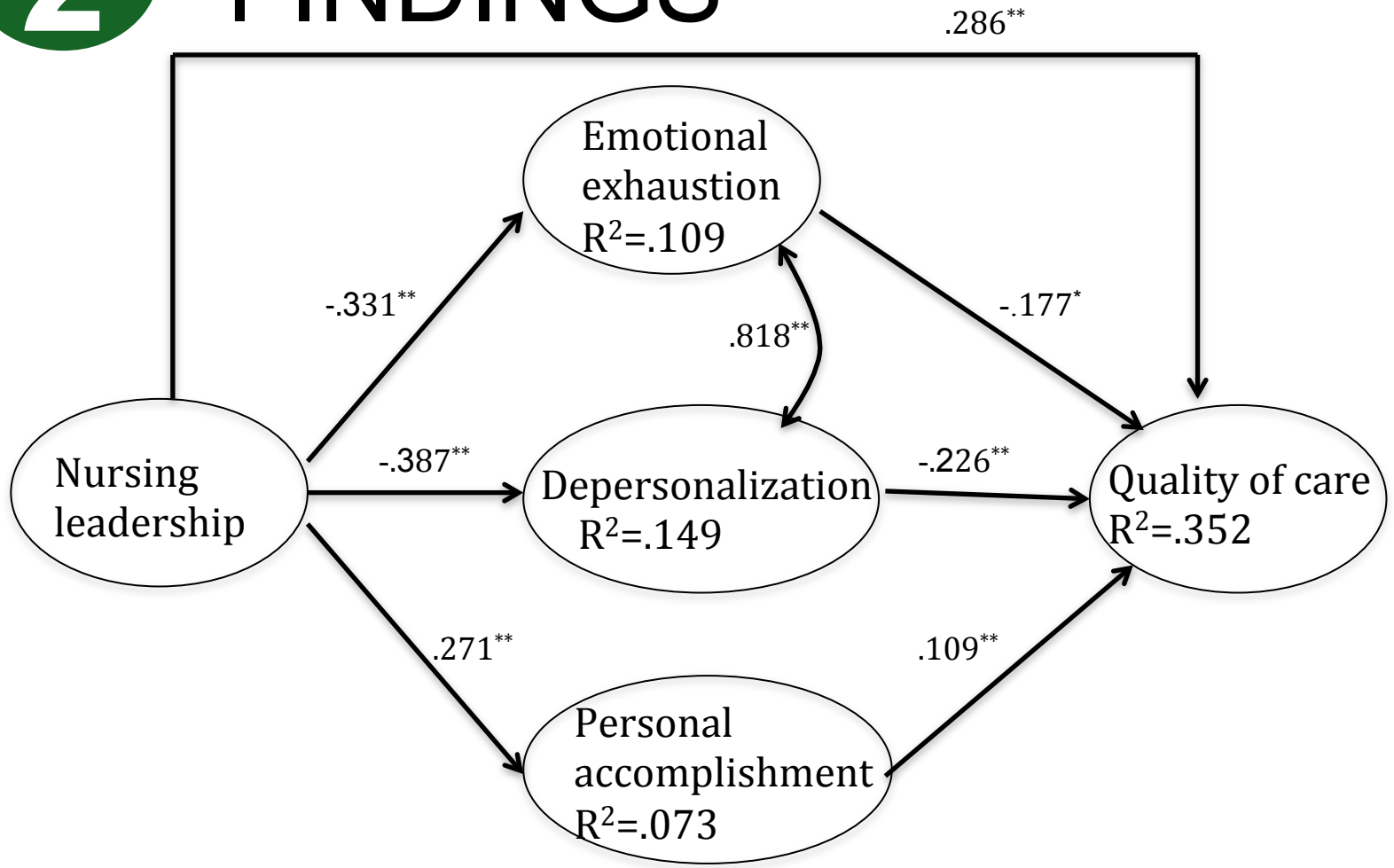
[a] Sample size for different characteristics varied due to missing data.

2 FINDINGS

Table 2 Descriptions of nursing leadership, nurse burnout, and quality of care.

Variables	Mean±**SD**	Range
Nursing leadership	3.15±0.67	1-4
Nurse burnout		
Emotional exhaustion	24.89±11.17	0-54
Depersonalization	7.28±5.86	0-30
Personal accomplishment	31.02±9.75	0-48
Quality of care	2.70±0.60	1-4

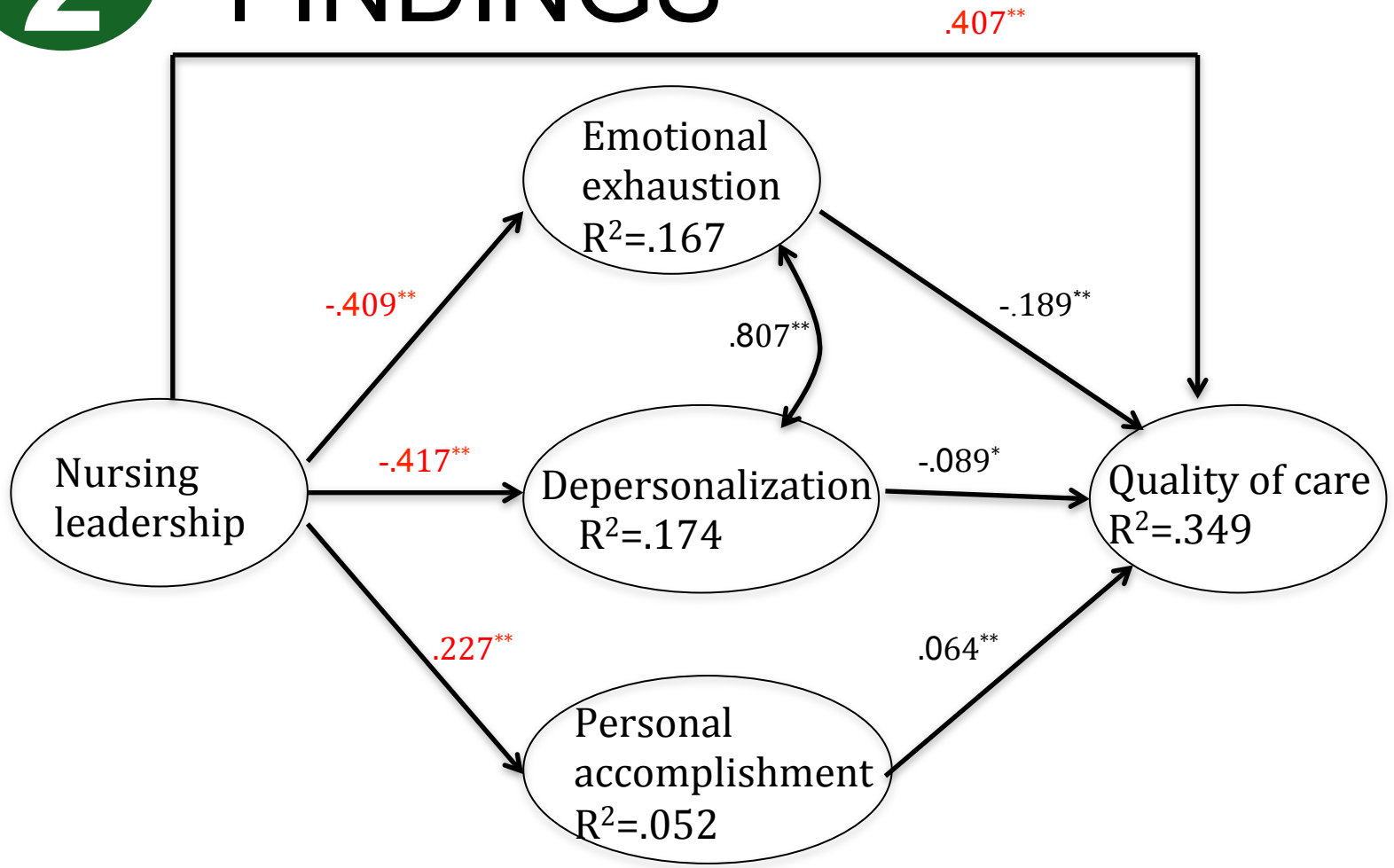
2 FINDINGS



The findings of **year 2014** supported our hypothesized model [CFI=.923, TLI=.908, SRMR=.057, and RMSEA=.057 (95% CI: .053-.061)].

Figure 1. Final model of nursing leadership, nurse burnout, and quality of care. $^{*}p<.05$, $^{**}p<.01$.

2 FINDINGS



The findings of **year 2018** supported our hypothesized model [CFI=.930, TLI=.916, SRMR=.063, and RMSEA=.062 (95% CI: .060-.064)].

Figure 2. Final model of nursing leadership, nurse burnout, and quality of care. *p<.05, **p<.01.

3 IMPLICATIONS

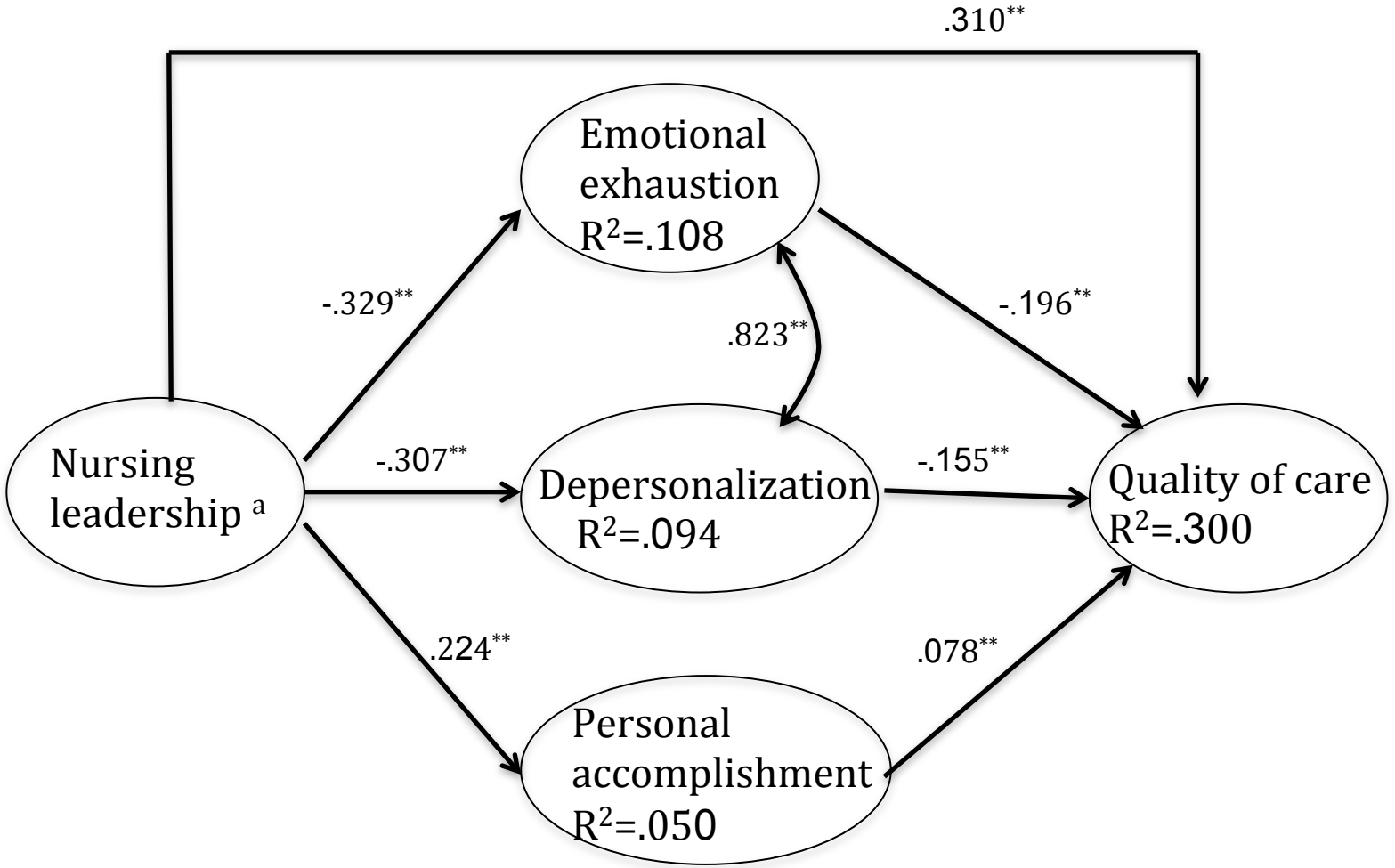
- Efforts to improve nursing leadership would not only help relieve nurse burnout, but also benefit quality of care improvement.

- Nursing leadership may play an more and more important role in improving nurse burnout and quality of care.

4 LIMITATIONS

- Only nurse-reported quality of care.
- Limited variance was explained by the model.
- A causal relationship can not be built based on a cross-sectional study.

SUPPLEMENT FINDINGS



The findings of **year 2018** supported our hypothesized model [CFI=.957, TLI=.948, SRMR=.062, and RMSEA=.062 (95% CI: .060-.065)].

Figure 3. Final model of nursing leadership, nurse burnout, and quality of care.
*p<.05, **p<.01. [a] Nursing leadership was measured with Leadership Practices Inventory Observer.

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