Available online at www.sciencedirect.com

ScienceDirect

Nurs Outlook 67 (2019) 558–566

Nursing Outlook

www.nursingoutlook.org

Workplace violence against nurses, job satisfaction, burnout, and patient safety in Chinese hospitals

Jiali Liu, PhD[a,1], Jing Zheng, PhD, RN[a,1], Ke Liu, PhD, RN[a], Xu Liu, BSN, PhD[a], Yan Wu, PhD, RN[b], Jun Wang, PhD[a], Liming You, PhD, RN[a,*]

[a]School of Nursing, Sun Yat-sen University, Guangzhou, China

[b]School of Nursing, Guangzhou University of Chinese Medicine, Guangzhou, China

ARTICLE INFO

Article history:
Received 8 November 2018
Received in revised form
6 April 2019
Accepted 28 April 2019
Available online May 2, 2019.

Keywords:
Workplace violence
Job satisfaction
Burnout
Patient safety

ABSTRACT

Background: Most nurses have experienced some form of workplace violence, which could lead to physical or psychological harm and reduced job performance. Previous studies have examined the effects of workplace violence on nurses' job satisfaction and patient safety, but there have been very few examinations of whether workplace violence affects patient safety through nurse job satisfaction and burnout.

Purpose: To investigate the relationships among workplace violence, nurse outcomes and patient safety. To explore whether nurse burnout and job satisfaction play mediating roles in the association of workplace violence and patient safety.

Methods: A cross-sectional survey was conducted in 23 hospitals in Guangdong province in China to collect data from 1502 nurses. A structural equation model design was tested with validated measurement instruments.

Findings: Nurse-reported workplace violence was found to be associated directly with higher incidences of burnout, less job satisfaction, lower patient safety and more adverse events. Nurse burnout was associated directly with lower patient safety and more adverse events. Higher nurse job satisfaction was associated directly with higher patient safety. Nurse burnout and job satisfaction played mediating roles in workplace violence and patient safety. The model explained 19.8% and 35.0% of nurse-reported patient safety and adverse events, respectively.

Discussion: It is important for administrators to consider how to protect nurses from workplace violence, to improve their wellbeing at work, and to deliver safe patient care. When nurses experience workplace violence, it is necessary to pay attention to their emotional reactions and job attitudes, and to provide them with support in order to avoid adverse impacts on patient safety. Further practices and research initiatives to support nurses' safety at work are recommended.

Cite this article: Liu, J., Zheng, J., Liu, K., Liu, X., Wu, Y., Wang, J., & You, L. (2019, September/October). Workplace violence against nurses, job satisfaction, burnout, and patient safety in Chinese hospitals. Nurs Outlook, 67(5), 558–566. https://doi.org/10.1016/j.outlook.2019.04.006.

* *Corresponding author:* Liming You, School of Nursing, Sun Yat-sen University, 74 Zhongshan Rd II, Guangzhou, 510089, China.
E-mail address: youlm@mail.sysu.edu.cn (L. You).

[1] **NB.**Jiali Liu and Jing Zheng should be considered joint first author.

https://doi.org/10.1016/j.outlook.2019.04.006

Introduction

Patient safety is a fundamental priority in health care systems worldwide; however, delivering safe care remains as one of the greatest challenges facing health care (World Health Organization [WHO], 2017). According to (WHO 2018), patient harm is the 14th leading cause of global disease burdens; one in 10 patients is harmed during hospitalization and approximately 43 million patient safety incidences occur every year. Unsafe patient care is as much a concern in the Chinese health care system as it is globally. A cross-national survey showed that cultures of patient safety were unsatisfactory in Chinese hospitals, where physicians and nurses have reported their perceptions of insufficient organizational resources to support safe patient care (Li, Tang, Wei, Zhou, & Xue, 2019). One study surveyed 459 Chinese nurses in 22 intensive care units, indicating that 45% of the respondents believed there was unsafe patient care on their units (Liu, Zheng, Liu, & You, 2019). Other studies have shown that unsafe patient care can lead to adverse events, in turn associated with poor patient outcomes and low healthcare efficiency (Berry et al., 2016; Ramanathan, Leavell, Wolfe, & Duane, 2014). Therefore, the promotion of patient safety is of utmost importance in health care systems.

As nurses provide direct care to patients and spend most of their work time with patients, nursing plays an important role in safe and high-quality care delivery (You et al., 2013). A growing research literature has linked nursing work environments, in which nurses carry out their professional practice, with patient safety. Research has indicated that healthy nursing work environments are associated with fewer adverse events, and higher care quality (Liu, You, Zheng, Ross, & Liu, 2016). Exposure to negative work environments may create physiological or psychological distress in nurses, which is related eventually to jeopardized patient safety (Oh, Uhm, & Yoon, 2016). It has been suggested that unwanted nurse outcomes, such as job dissatisfaction and burnout, play a mediating role in the relationship of poor nursing work environments and unsafe patient care (Liu et al., 2018).

Workplace violence is known as one of the most challenging issues in negative nursing work environments. A high prevalence of workplace violence in health care systems has been reported around the world. A meta-analysis of 136 international research studies, conducted in Anglo, Asian, European, and Middle East regions, showed that 36.4% of nurses reported having been physically assaulted, with 67.2% reporting nonphysical assaults (Spector, Zhou, & Che, 2014). Groenewold et al. (2017) analyzed surveillance data about injury due to workplace violence from 2012 to 2015 in the US. They suggested that nurses have the highest workplace violence injury rates of all health professionals, finding that the nurses in their study faced 1.7 times the risk of experiencing injury due to workplace violence than personnel not involved in patient care. National survey data indicated that more than half of the nurses surveyed had experienced workplace violence in the prior 12 months in Turkey (51%), Australia (67%), and China (68%; Pinar et al., 2017; Shea, Sheehan, Donohue, Cooper, & De Cieri, 2017; Zhang et al., 2017).

The seriousness of workplace violence against health care workers is receiving increasing public attention. In 2015, the National Health Commission of China (NHC, 2015) established the “safe hospital” policy, aiming to build safe working environments for health care workers. After the implementation of the policy, some provinces established regulations to solve health care disputes; more than 85% of level 2 and level 3 hospitals were equipped with security guard offices; and more than 6,000 hospitals’ emergency alarm devices were connected to local departments of public security (NHC, 2017). As measures to combat workplace violence against health care workers continue to be implemented, evidence is needed to analyze the effectiveness.

According to the job demands-resources model, job demands such as high work pressure, interpersonal conflicts, and unfavorable work environments may lead to burnout and dissatisfaction, and negatively impact upon employees’ well-being and professional performance (Bakker & Demerouti, 2007; Nakagawa et al., 2014). Research has demonstrated a negative association between workplace violence and patient safety. Roche, Diers, Duffield, and Catling-Paull (2010) found that violence toward nurses was associated with delayed tasks and increased medical errors. Nurses reported that workplace violence could distract them from work, disrupt nursing interactions, and lead to substandard care and errors (Wolf, Perhats, Delao, & Clark, 2017). Recent studies have also shown that workplace violence can impact negatively upon nurses’ attitudes toward the job; nurses have reported stress, burnout and job dissatisfaction after experiencing workplace violence (Hassankhani, Parizad, Gacki-Smith, Rahmani, & Mohammadi, 2017; Jaradat et al., 2016). Nurses who had suffered from physical assaults were found to be 2.7 times more likely to leave the nursing profession (Boafo, & Hancock, 2017). Previous studies have shown poor nurse outcomes to be associated with unsafe patient care. However, seldom studies have tried to explore the relationship between workplace violence and patient safety, of the mediating effects of nurse job satisfaction and burnout. To our best knowledge, only one study, conducted in South Korea, has reported an association between workplace bullying and patient safety outcomes through the mediator of nurse turnover intention (Oh et al., 2016). More evidence is needed to deepen our understanding of how workplace violence is related to patient safety.

Based on the job demands-resources model and review of literature, we hypothesized that (a) higher nurse-reported frequencies of workplace violence would be related directly to more burnout, less job

satisfaction, lower ratings of patient safety, and higher nurse-reported frequencies of adverse patient outcomes; (b) nurse job dissatisfaction and burnout would be associated directly with unsafe patient care and adverse patient outcomes; (c) through the mediating effects of nurse job dissatisfaction and burnout, workplace violence would be associated indirectly with unsafe patient care and adverse patient outcomes.

Methods

Design and Sample

A descriptive, cross-sectional design was used to collect survey data from nurses. First, convenience sampling was used to select 23 level 2 hospitals (300-<500 beds) and level 3 hospitals ($\geq$ 500 beds) across Guangdong province in southern China. Level 1 hospitals and level 2 hospitals with less than 300 beds were excluded because adequate samples of nurses could not be achieved. Second, the list of medical and surgical units was obtained from each hospital. At least three medical or surgical units were selected randomly from each hospital, using a random number table. All clinical registered staff nurses who were providing direct care to patients and working fulltime in the selected units were eligible participants. Nurse managers and nurses who were on leave during the survey were excluded.

The study was approved by the Ethical Committee of the School of Nursing, Sun Yat-sen University, before the data collection. Data were collected in December 2013 to August 2014. The researchers contacted the director of nursing in each hospital to obtain permission. Then the researchers went to the selected medical units and surgical units to invite all eligible nurses in the selected units to participate. The researchers delivered an envelope with an informed consent form and a questionnaire to every eligible nurse. The nurses were asked to fill the nurse questionnaire, seal it in the envelope, and put the envelope into a locked box placed in their units within seven days after the survey distribution. To protect confidentiality, no identification information of participants was collected. Completion and return of the questionnaires was considered as consent to participate. The sealed envelopes were collected by researchers. All the envelopes remained unopened until they arrived at the research center at the University. A total of 1,671 nurse surveys were delivered, and 1,502 valid responses were returned (response rate, 89.9%).

Measures

This study used the China Nurse Survey developed for the China Hospital Nurse Workforce Research to collect the data (You et al., 2013). The China Nurse Survey was adapted from the Pennsylvania Registered Nurse Questionnaire (Florida version; Clarks & Aiken, 2008). The survey consisted of questions regarding nurse-reported workplace violence, job satisfaction, burnout, patient safety, and nurses' demographic characteristics. The survey was translated from English to Mandarin by a researcher and a bilingual expert independently, and back-translated into English by another two bilingual experts. The authors of the English version of the survey approved the back-translated version. A pilot study was carried out in a level 3 hospital in Guangdong province to test the feasibility and the reliability of the Chinese version. The Cronbach's α coefficients for all multi-item scales in this study were 0.71 to 0.86, indicating an acceptable internal consistency. The confirmatory factor analysis showed that the construct validity of multi-item scales in this study was good.

Workplace Violence

The measure of workplace violence has been used widely in international studies (Al-Omari, 2015; Hanrahan, Kumar, & Aiken, 2010; Khademloo, Moonesei, & Gholizade, 2013). This instrument included two items about nurse-reported (a) verbal abuse and (b) physical abuse, these being two representations of workplace violence for hospital nurses (Atan et al., 2013; Pinar & Ucmak, 2011). We adapted the measure by adding information about the perpetrator/s. Consequently, we measured the frequency of nurses experiencing (a) verbal abuse from patients or families, (b) physical abuse from patients or families, (c) verbal abuse from other staff, and (d) physical abuse from other staff in the 12 months prior to the data collection. The responses to each item ranged from 0 = *never happened* to 5 = *every day*. The responses were dichotomized as *less frequent* (i.e., *a few times a year* or less) and *frequent* (i.e., *a few times a month* or more) to describe the frequencies of four types of workplace violence. The mean score of four items was used in the correlation analysis. For the structural equation modeling (SEM), the scores of four items were used as observed indicators of workplace violence, which was the latent variable.

Burnout

Nurse burnout was measured by the emotional exhaustion subscale of the Maslach Burnout Inventory-Human Service Survey, as exhaustion has been described as the core and most prominent experience of burnout (Maslach & Leiter, 2008; Maslach, Jackson & Leiter, 1996). The subscale has been established as a reliable and valid measure in other studies (Liu et al., 2018; Maslach & Jackson, 1981). The emotional exhaustion subscale included nine items, scored on a 7-point Likert scale ranging from 0 = *never* to 6 = *daily*. The sum scores of the items were calculated for descriptive and correlational analyses, with higher scores indicating higher levels of burnout. The scores $\leq$ 18 were considered as low burnout, 19 to 26 as moderate burnout,

and ≥27 as high burnout (Maslach, Jackson, Leiter, 1996). In the SEM, the nine items were divided into three parcels as indicators of burnout to decrease measurement error and obtain model estimation stability (Liu et al., 2018; Matsunaga, 2008).

Job Satisfaction

Nurse job satisfaction was measured with a single item, asking nurses to rate their overall satisfaction with their current jobs (Aiken et al., 2012; You et al., 2013). The item was rated on a Likert scale from 1 = *very dissatisfied* to 4 = *very satisfied*. The tool has been widely used in international studies and is regarded as a reliable and valid measure for job satisfaction (Aiken et al., 2012; Liu et al., 2018; You et al., 2013). Responses of *very satisfied* and *satisfied* were combined into a category of *satisfied*, and *very dissatisfied* and *dissatisfied* were combined as *dissatisfied* to describe nurse job satisfaction. The 4-point Likert scale for job satisfaction was used as an observed indicator in the SEM.

Patient Safety

Nurses were regarded as important informants, thus patient safety was assessed with two nurse-reported measures. One was an item from the Agency for Healthcare Research and Quality Hospital Survey on Patient Safety Culture: *Please give an overall grade of patient safety for your unit*, rated from 1 = *poor* to 5 = *excellent* (Agency for Healthcare Research and Quality, 2013). We compared nurses who graded patient safety as *poor* or *failing* with those who graded it as *excellent, good*, or *acceptable* in the statistical description. The nurse-reported patient safety was used as a continuous observed variable in the SEM.

The other measure was nurse-reported frequencies of adverse events in the previous 12 months in their units. The adverse events indicators included medication errors, patient falls with injuries, pressure ulcers, transfusion site swelling or bleeding, phlebitis, transfusion reaction, hospital-acquired pneumonia, and unplanned extubation. The adverse event indicators were mainly nurse-sensitive quality indicators and nursing-associated adverse events reported in previous studies (Aiken et al., 2017; Hu et al., 2013; Liu et al., 2018; National Institute of Hospital Administration, 2016). They have been used widely in international studies and been have found to be associated with patient outcomes (Aiken et al., 2017; Liu et al., 2018). Responses were rated from 1 = *never happened*, 2 = *a few times a year*, 3 = *a few times a month*, 4 = *a few times a week*, to 5 = *every day*. The frequency was dichotomized as less frequent (i.e., *a few times a year* or less) and frequent (i.e., *a few times a month* or more) to describe the occurrences of adverse events (Aiken et al., 2013). The average score of eight items was used in the correlation analysis. In the SEM, the scores of eight items were used as observed indicators of patient adverse events.

Data Analysis

Descriptive statistics and reliability tests based on Cronbach's α, and Pearson correlation analysis were processed with the Statistical Package for the Social Sciences (version 20.0). Following this, the Mplus version 7.0 was used to estimate the SEM. Structural equation modeling with robust maximum likelihood estimator was used to estimate the direct and indirect relationships among workplace violence, nurse burnout, job satisfaction, and patient safety. Significant pathways were estimated using standardized regression weights. The indices of model fit included standardized root mean square residual (SRMR < 0.08), comparative fit index (CFI > 0.90), Tucker-Lewis index (TLI > 0.90), and root mean square error of approximation (RMSEA < 0.08).

Findings

Nurse Characteristics

In total, 1,502 nurses were included in this study. Nurses' average age was 27.51 years and they had an average of 6.58 years of nursing experience. Most were female (98.81%), and about two-fifths held bachelor degrees in nursing. Fifty-six percent worked in medical units and 44% in surgical units, see Table 1.

Descriptions and Correlations of Variables

Twenty-eight percent of the nurses reported having experienced frequent verbal abuse from patients or families in the past 12 months. However, physical abuse from patients or families, verbal abuse, and physical abuse from other staff were reported as infrequent by most of nurses (93%–96%), see Table 1. Around one quarter of the nurses reported moderate burnout (25.01) and half said they were satisfied with their jobs (50%). About 7% assessed the patient safety on their units as failing or poor. Frequent transfusion site swelling or bleeding was reported by 39% of nurses, while the frequency of other types of adverse events was rated as infrequent by the majority (90%–98%).

Before testing the model, a correlation matrix was prepared (Table 2). Workplace violence was related to job burnout, less job satisfaction, worse patient safety, and more adverse events ($|r| = 0.223–0.516$, $p < .01$). As mediating factors, nurse job burnout and job satisfaction were related significantly to overall patient safety ($|r| = 0.332–0.363$, $p < .01$) and adverse events ($|r| = 0.169–0.221$, $p < .01$).

Model Testing

The results supported the hypothesized model: CFI = 0.935, TLI = 0.917, RMSEA = 0.05 (90% confidence interval = 0.046–0.055), SRMR = 0.047. The standardized

Table 1 – Descriptions of Nurse Characteristics, Workplace Violence, Nurse Burnout, Job Satisfaction, and Nurse-Reported Patient Safety in Chinese Hospitals (*n* = 1,502)

	Mean ± SD/*n* (%)
Nurse characteristics	
Age*	27.51 ± 6.24
Gender (female, *n* = 1,438)	1421 (98.81)
Years in nursing*	6.58 ± 6.51
Bachelor of science in nursing (*n* = 1,473)	598 (40.60)
Primary specialty areas (*n* = 1,502)	
Medical units	839 (55.86)
Surgical units	663 (44.14)
Nurse-experienced frequent workplace violence in the past 12 months†	
Verbal abuse from patients or families (*n* = 1,493)	425 (28.47)
Physical abuse from patients or families (*n* = 1,490)	98 (6.58)
Verbal abuse from other staff (*n* = 1,394)	99 (7.10)
Physical abuse from other staff (*n* = 1,407)	55 (3.91)
Burnout (Emotional exhaustion)‡	25.01 ± 10.93
Satisfied with job (*n* = 1,473)	738 (50.10)
Nurse-reported patient safety	
Nurse-rated patient safety as failing or poor (*n* = 1,490)	101(6.78)
Nurse-perceived frequent adverse events in the past 12 months†	
Swelling or bleeding at intravenous catheter sites (*n* = 1,477)	576 (39.00)
Unplanned extubation (*n* = 1,471)	151 (10.27)
Phlebitis (*n* = 1,473)	122 (8.28)
Hospital-acquired pneumonia (*n* = 1,423)	57 (4.01)
Preventable pressure ulcer (*n* = 1,492)	37 (2.48)
Infusion reaction (*n* = 1,475)	69 (4.68)
Patient falls with injuries (*n* = 1,491)	32 (2.15)
Wrong medication or dose (*n* = 1,493)	31 (2.07)

* The median and interquartelie (P25–P75) of nurses' age was 26 (23–30); and the median and interquartelie (P25–P75) of nurses' working years was 4 (2–9).
† "Frequent" refer to nurse-reported frequency equal to or greater than a few times a month.
‡ The median and interquartelie (P25–P75) of emotional exhaustion was 24 (17–32).

coefficients of direct and indirect paths were shown in Figure 1 and Table 3. Workplace violence had direct positive effects on nurse burnout and adverse events, and direct negative effects on nurse job satisfaction and nurse-reported patient safety.

Nurse burnout had direct negative effects on nurse-reported patient safety, and direct positive effects on adverse events. Job satisfaction had direct positive effects on nurse-reported patient safety; however, the direct association between job satisfaction and adverse events were not statistically significant.

Workplace violence showed indirect effects on nurse-reported patient safety through the mediating effects of burnout and job satisfaction (Table 4). Workplace violence also had indirect effects on adverse events through burnout. The model explained 19.8% and 35.0% of variance of nurse-reported patient safety and adverse events, respectively.

Discussion

Overall, the results supported our hypothesis linking workplace violence and nurses with more burnout, less job satisfaction, and lower patient safety. The results provide empirical support for a more comprehensive explanation of how workplace violence may influence patient safety by producing job dissatisfaction and burnout.

Table 2 – Range, Means, SDs, Cronbach's α, and Correlations for Major Study Variables

	Range	Mean ± SD	Cronbach's α	2	3	4	5
1. Workplace violence	1–5	1.59 ± 0.54*	.71	.314**	−.223**	−.272**	.516**
2. Burnout	0–54	25.01 ± 10.93†	.86		−.469**	−.332**	.221**
3. Job satisfaction	1–4	2.54 ± 0.67*	-			.363**	−.169**
4. Overall patient safety	1–5	3.55 ± 0.82*	-				−.307**
5. Adverse events	1–5	1.68 ± 0.41*	.74				

* Item means.
† Sums of item ratings.
** $p < .01$.

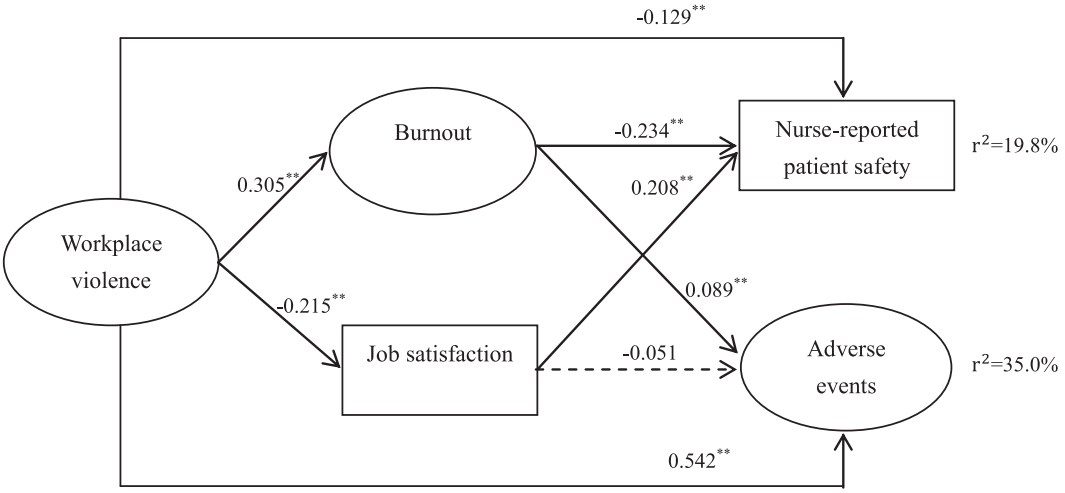

Figure 1 – Standardized coefficients of direct effects of workplace violence, nurse outcomes and patient safety.
Note. The dashed line with arrow represents the nonsignificant path; $^{**}p < .01$.

Table 3 – Factor Loading of Observed Variables on Latent Variables

	Factor loading
Workplace violence	
Verbal abuse from patients or families	.49
Physical abuse from patients or families	.73
Verbal abuse from other staff	.66
Physical abuse from other staff	.74
Burnout	
Parcel 1 (emotionally drained, used up, and fatigued)	.83
Parcel 2 (strained, burned out, and frustrated)	.79
Parcel 3 (working too hard, stressed, and at the end of rope)	.57
Adverse events	
Wrong medication or dose	.49
Patient falls with injuries	.49
Preventable pressure ulcer	.50
Hospital-acquired pneumonia	.64
Swelling/bleeding at intravenous catheter sites	.51
Infusion reaction	.63
Phlebitis	.62
Unplanned extubation	.60

Table 4 – Indirect Effects of Workplace Violence on Patient Safety in the Model

Paths	Standardized Coefficient	Standard Error	*p* Value
1. WV—JS—NPS	−0.045	0.008	<.001**
2. WV—BO—NPS	−0.071	0.013	<.001**
3. WV—JS—AE	0.011	0.007	.111
4. WV—BO—AE	0.027	0.012	.019*

Note. AE, adverse events; BO, burnout; JS, job satisfaction; NPS, nurse-reported patient safety; WV, workplace violence.

* $p < .05$.
** $p < .01$.

In this study, half of nurses said they were satisfied with their jobs, but the majority had experienced moderate burnout, and some reported poor patient safety. These results indicated that the nurses' job satisfaction and patient safety had not improved significantly since previous studies that were conducted in China (You et al., 2013; Zhang et al., 2014). The Chinese nurses in this study reported similar or higher levels of burnout to those participating in studies in Brazil, Thailand, Jordan, the United States, and European countries, but their levels of job satisfaction were lower (Al-Hamdan, Banerjee, & Manojlovich, 2018;

Dutra, Cimiotti, & Guirardello, 2018; Kutney-Lee, Wu, Sloane, & Aiken, 2013; Nantsupawat et al., 2017). Their perceptions of patient safety levels in Chinese hospitals were similar to those reported by nurses in the United States and most of the European countries (except for Greece and Poland; Aiken et al., 2012). Efforts are still needed to improve nurses' wellbeing at work and patient safety.

The results showed that increases in nurses' perceptions of the frequencies of workplace violence contributed directly to increased burnout, reduced job satisfaction, and unsafe patient care. This is congruent with previous studies linking workplace violence to lower job satisfaction, higher job stress, and negative patient outcomes (Banda, Mayers, & Duma, 2016; Graham, 2017; Tee, ÜzarÖzçetin, & Russell-Westhead, 2016). Workplace violence can have prolonged effects on nurses' wellbeing and work performance; those who had experienced it reported that their experiences had negative effects on their physical and mental health, social integrity, and professional performance (Hassankhani et al., 2017). This study has corroborated previous studies, highlighting the fundamental importance of preventing workplace violence in building healthy work environments (Blake, 2016). As hospital nurses still suffer from workplace violence, especially verbal abuse from patients/families, our results support the implementation of "safe hospital" policies and showing zero tolerance to workplace violence toward health care workers, including nurses, in order to retain them and to improve patient safety.

In this study, associations were demonstrated between nurses' burnout, job satisfaction, and perceptions of patient safety. Our results were consistent with previous research, showing that high burnout, and low job satisfaction were associated with reduced quality of care and increased adverse patient-related events (Bai, 2016; Nantsupawat, Nantsupawat, Kunaviktikul, Turale, & Poghosyan, 2015; Van Bogaert, Kowalski, Weeks, Van Heusden, & Clarke, 2013).

Nurses' job satisfaction and burnout have been associated repeatedly with their work environment and patient care (Bai, 2016; Van Bogaert, Meulemans, Clarke, Vermeyen, & Heyning, 2010). This study has added more to this association, suggesting that workplace violence can increase nurses' job dissatisfaction and burnout, thus affecting patient safety. This is consistent with the study reported by Oh et al. (2016), showing a negative indirect effect of workplace violence on patient outcomes through nurses' emotional reactions. Workplace violence can reduce nurses' passion for care and their concentration at work, thus leading eventually to disruptive care (Han et al., 2017). The results from our study suggested that concerns about nurses' emotional or attitudinal changes, along with workplace violence, should not be underscored. Paying attention to their attitudinal and emotional reactions after suffering workplace violence might buffer its negative effects on patient care.

Implications for Practice

Workplace violence has negative effects on nurses' wellbeing at work and on patient safety. It is important to take action to prevent workplace violence. The health care system in China sets a good example by adopting a "safe hospital" policy, in which social media is used to promote positive images of nurses and help people to recognize the contributions of nurses. In collaboration with the public security departments, hospitals have built warning and defense systems to address workplace violence. Hopefully, strategies such as these can reduce workplace violence against health care workers, including nurses, effectively (NHC, 2017). Based on our results, it is also suggested that hospitals take steps to enhance the aftermath management for nurses who have experienced workplace violence. Recent evidence has suggested that most health care workers who have experienced physical violence do not report the incidence, because they regard it as pointless to do so, or do not know who to report to (Wang, Yang, Zhou, & Hesketh, 2017). Therefore, there is a need to establish a system for reporting workplace violence. When a nurse reports an experience of workplace violence, professional psychological consultations and support from hospital administrators and nurse managers should be provided, so as to decrease the nurse's stress, and to ensure patient safety.

Potential Limitation

There were some limitations in this study that need to be taken into account. First, the data were cross-sectional, hence did not allow for observation of the temporality order of exploratory variable changes and outcome changes, and limited the inference of causality. Second, common method variance could not be ruled out, as all data were nurse-reported. Although common method variance does not necessarily invalidate results, multisource data, such as objective patient outcome data or patient-reported patient safety, could be used in future studies to address this issue. Finally, although our study focused on the association of workplace violence and patient safety, there are other factors, such as nurse staffing and nurse-physician collaboration, which were not included in this study that could account for nurse-reported adverse patient outcomes.

Conclusion

In this study, associations were found between workplace violence, nurses' job satisfaction, burnout and patient safety, which contribute to a growing body of empirical evidence showing the connection between negative work environments and patient safety. The importance of preventing workplace violence toward nurses to keep both nurses and patients safety was

reinforced. An important implication of this study is the need for remedies after workplace violence occurs, in the form of support to relieve nurses' stress and help them to return to normal work life.

Funding

This study was funded by the China Medical Board (CMB, CMB-10-021, Liming You, PI) and the Medical Scientific Research Foundation of Guangdong Province (A2017226, Jiali Liu, PI).

Supplementary materials

Supplementary material associated with this article can be found in the online version at doi:10.1016/j.outlook.2019.04.006.

REFERENCES

Agency for Healthcare Research and Quality. Hospital survey on patient safety culture. (2013). Retrieved from http://www.ahrq.gov/qual/hospsurveydb/hospdbtaba9.htm. Accessed October 2018.

Aiken, L. H., Sermeus, W., Heede, K. V. D., Sloane, D. M., Busse, R., Mckee, M., et al. (2012). Patient safety, satisfaction, and quality of hospital care:CRoss sectional surveys of nurses and patients in 12 countries in Europe and the United States. *BMJ, 344*(mar202), e1717.

Aiken, L. H., Sloane, D. M., Bruyneel, L., Van, d. H. K., Sermeus, W., & Consortium, R. (2013). Nurses' reports of working conditions and hospital quality of care in 12 countries in Europe. *International Journal of Nursing Studies, 50*(2), 143–153.

Aiken, L. H., Sloane, D., Griffiths, P., Rafferty, A. M., Bruyneel, L., Mchugh, M., et al. (2017). Nursing skill mix in European hospitals: Cross-sectional study of the association with mortality, patient ratings, and quality of care. *BMJ Quality & Safety, 26*(7), 559–568.

Al-Hamdan, Z., Banerjee, T., & Manojlovich, M. (2018). Communication with physicians as a mediator in the relationship between the nursing work environment and select nurse outcomes in Jordan. *Journal of Nursing Scholarship, 50*, 714–721 [Epub ahead of print].

Al-Omari, H. (2015). Physical and verbal workplace violence against nurses in Jordan. *International Nursing Review, 62*(1), 111–118.

Atan, S. U., Arabaci, L. B., Sirin, A., Isler, A., Donmez, S., Guler, M. U., et al. (2013). Violence experienced by nurses at six university hospitals in Turkey. *Journal of Psychiatric and Mental Health Nursing, 20*(10), 882–889.

Bai, J. (2016). Does job satisfaction mediate the relationship between healthy work environment and care quality? *Nursing in Critical Care, 21*(1), 18–27.

Bakker, A. B., & Demerouti, E. (2007). The job demands-resources model: State of the art. *Journal of Managerial Psychology, 22*(3), 309–328.

Banda, C. K., Mayers, P., & Duma, S. (2016). Violence against nurses in the southern region of Malawi. *Health SaGesondheid, 21*(C), 415–421.

Berry, J. C., Davis, J. T., Bartman, T., Hafer, C. C., Lieb, L. M., Khan, N., et al. (2016). Improved safety culture and teamwork climate are associated with decreases in patient harm and hospital mortality across a hospital system. *Journal of Patient Safety* [Epub ahead of print].

Blake, N. (2016). Building respect and reducing incivility in the workplace: Professional standards and recommendations to improve the work environment for nurses. *AACN Advanced Critical Care, 27*(4), 368–371.

Boafo, I. M., & Hancock, P. (2017). Workplace violence against nurses: A cross-sectional descriptive study of Ghanaian nurses. *Sage Open, 7*(1), 1–7.

Clarke, S. P., & Aiken, L. H. (2008). An international hospital outcomes research agenda focused on nursing: lessons from a decade of collaboration. *Journal of Clinical Nursing, 17*, 3317–3323.

Dutra, H. S., Cimiotti, J. P., & Guirardello, E. B. (2018). Nurse work environment and job-related outcomes in Brazilian hospitals. *Applied Nursing Research, 41*, 68–72.

Graham, H. (2017). The impact of a violent physical assault on a registered nurse: Her healing journey and return to work. *Journal of Forensic Nursing, 13*(2), 81.

Groenewold, M. R., Sarmiento, R. F. R., Vanoli, K., Raudabaugh, W., Nowlin, S., & Gomaa, A. (2017). Workplace violence injury in 106 US hospitals participating in the occupational health safety network (OHSN), 2012-2015. *American Journal of Industrial Medicine, 61*(2), 157–166.

Han, C. Y., Lin, C. C., Barnard, A., Hsiao, Y. C., Goopy, S., & Chen, L. C. (2017). Workplace violence against emergency nurses in Taiwan: A phenomenographic study. *Nursing Outlook, 65*(4), 428–435.

Hanrahan, N. P., Kumar, A., & Aiken, L. H. (2010). Adverse events associated with organizational factors of general hospital inpatient psychiatric care environments. *Psychiatric Services, 61*(6), 569–574.

Hassankhani, H., Parizad, N., Gacki-Smith, J., Rahmani, A., & Mohammadi, E. (2017). The consequences of violence against nurses working in the emergency department: A qualitative study. *International Emergency Nursing, 39*, 20–25.

Hu, H. G., You, L. M., Zheng, J., Liu, K., Wang, Y., Sun, H. Y., et al. (2013). Investigation of the adverse events of patients in Chinese hospitals. *Chinese Journal of Nursing Administration, 13*(2), 77–80 (in Chinese).

Jaradat, Y., Nielsen, M. B., Kristensen, P., Nijem, K., Bjertness, E., Stigum, H., et al. (2016). Workplace aggression, psychological distress, and job satisfaction among Palestinian nurses: A cross-sectional study. *Applied Nursing Research, 32*, 190–198.

Khademloo, M., Moonesei, F. S., & Gholizade, H. (2013). Health care violence and abuse towards nurses in hospitals in north of Iran. *Global Journal of Health Science, 5*(4), 211–216.

Kutney-Lee, A., Wu, E. S., Sloane, D. M., & Aiken, L. H. (2013). Changes in hospital nurse work environments and nurse job outcomes: An analysis of panel data. *International Journal of Nursing Studies, 50*(2), 195–201.

Li, M. Q., Tang, H. Q., Wei, X. F., Zhou, P., & Xue, D. (2017). Status of Patient Safety in Public Hospitals in China. *Chinese Hospital Management, 37*(1), 11–13.

Liu, J., You, L., Zheng, J., Ross, A. M., & Liu, K. (2016). Effects of work environment on quality of care in ICUs: A multisite survey in china. *Journal of Nursing Care Quality, 31*(3), E1–E8.

Liu, J., Zheng, J., Liu, K., & You, L. M. (2019). Relationship between work environments, nurse outcomes, and quality of care in ICUs: Mediating role of nursing care left undone. *Journal of Nursing Care Quality, 34*(3), 250–255.

Liu, X., Zheng, J., Liu, K., Baggs, J. G., Liu, J., Wu, Y., et al. (2018). Hospital nursing organizational factors, nursing care left undone, and nurse burnout as predictors of patient safety: A structural equation modeling analysis. *International Journal of Nursing Studies, 86*, 82–89.

Maslach, C., & Jackson, S. E. (1981). The measurement of experienced burnout. *Journal of Occupational Behavior, 2*, 99–113.

Maslach, C., Jackson, S. E., & Leiter, M. P. (1996). *Maslach Burnout Inventory* (3rd ed.). Palo Alto, CA: Consulting Psychologists Press.

Maslach, C., & Leiter, M. P. (2008). Early predictors of job burnout and engagement. *Journal of Applied Psychology, 93*(3), 498–512.

Matsunaga, M. (2008). Item parceling in structural equation modeling: A primer. *Communication Methods & Measures, 2*(4), 260–293.

Nakagawa, Y., Inoue, A., Kawakami, N., Tsuno, K., Tomioka, K., Nakanishi, M., et al. (2014). Job demands, job resources, and job performance in Japanese workers: Across-sectional study. *Industrial Health, 52*(6), 471–479.

Nantsupawat, A., Kunaviktikul, W., Nantsupawat, R., Wichaikhum, O. A., Thienthong, H., & Poghosyan, L. (2017). Effects of nurse work environment on job dissatisfaction, burnout, intention to leave. *International Nursing Review, 64*(1), 91–98.

Nantsupawat, A., Nantsupawat, R., Kunaviktikul, W., Turale, S., & Poghosyan, L. (2015). Nurse burnout, nurse-reported quality of care, and patient outcomes in Thai hospitals. *Journal of Nursing Scholarship, 48*(1), 83–90.

National Health Commission of the People's Republic of China. (2015). Opinions on deepening the establishment of ''Safe Hospital'' activities to maintain medical order in accordance with law. Retrieved from http://www.nhc.gov.cn/yzygj/s3589/201510/a82f34b8e21c44ffa029c004e6152da1.shtml. Accessed March 2019.

National Health Commission of the People's Republic of China. (2017). Report on the work of maintain medical order in 2016. Retrieved from http://www.nhc.gov.cn/yzygj/s3590/201702/de9f284c30f546dba85ba8323538cfa8.shtml. Accessed March 2019.

National Institute of Hospital Administration (People's Republic of China). (2016). *Handbook of Nursing-sensitive Quality Indicators*. Beijing: People's Medical Publishing House.

Oh, H., Uhm, D. C., & Yoon, Y. J. (2016). Workplace bullying, job stress, intent to leave, and nurses' perceptions of patient safety in South Korean hospitals. *Nursing Research, 65*(5), 380–388.

Pinar, T., Acikel, C., Pinar, G., Karabulut, E., Saygun, M., Bariskin, E., et al. (2017). Workplace violence in the health sector in Turkey: A national study. *Journal of Interpersonal Violence, 32*(15), 2345–2365.

Pinar, R., & Ucmak, F. (2011). Verbal and physical violence in emergency departments: A survey of nurses in Istanbul, Turkey. *Journal of Clinical Nursing, 20*(3–4), 510–517.

Ramanathan, R., Leavell, P., Wolfe, L. G., & Duane, T. M. (2014). Agency for healthcare research and quality patient safety indicators and mortality in surgical patients. *The American Surgeon, 80*(8), 801–804.

Roche, M., Diers, D., Duffield, C., & Catling-Paull, C. (2010). Violence toward nurses, the work environment, and patient outcomes. *Journal of Nursing Scholarship, 42*(1), 13–22.

Shea, T., Sheehan, C., Donohue, R., Cooper, B., & De Cieri, H. (2017). Occupational violence and aggression experienced by nursing and caring professionals. *Journal of Nursing Scholarship, 49*(2), 236–243.

Spector, P. E., Zhou, Z. E., & Che, X. X. (2014). Nurse exposure to physical and nonphysical violence, bullying, and sexual harassment: A quantitative review. *International Journal of Nursing Studies, 51*(1), 72–84.

Tee, S., ÜzarÖzçetin, Y. S., & Russell-Westhead, M. (2016). Workplace violence experienced by nursing students: A UK survey. *Nurse Education Today, 41*, 30–35.

Van Bogaert, P., Meulemans, H., Clarke, S., Vermeyen, K., & Heyning, P. V. D. (2010). Hospital nurse practice environment, burnout, job outcomes and quality of care: Test of a structural equation model. *Journal of Advanced Nursing, 65*(10), 2175–2185.

Van Bogaert, P., Kowalski, C., Weeks, S. M., Van Heusden, D., & Clarke, S. P. (2013). The relationship between nurse practice environment, nurse work characteristics, burnout and job outcome and quality of nursing care: A cross-sectional survey. *International Journal of Nursing Studies, 50*(12), 1667–1677.

Wang, N., Yang, S., Zhou, X., & Hesketh, T. (2017). Workplace violence and its aftermath among health workers in Zhejiang province: A cross-sectional study. *Lancet, 390*(S4), s81.

Wolf, L. A., Perhats, C., Delao, A. M., & Clark, P. R. (2017). Workplace aggression as cause and effect: Emergency nurses' experiences of working fatigued. *International Emergency Nursing, 33*, 48–52.

World Health Organization. (2017). Patient Safety: Making health care safer. Geneva. Licence: CC BY-NC-SA3.0 IGO.

World Health Organization. (2018). 10 facts on patient safety. Retrieved from http://www.who.int/features/factfiles/patient_safety/en/. Accessed March 2019.

You, L. M., Aiken, L. H., Sloane, D. M., Liu, K., He, G. P., Hu, Y., et al. (2013). Hospital nursing, care quality, and patient satisfaction: Cross-sectional surveys of nurses and patients in hospitals in china and Europe. *International Journal of Nursing Studies, 50*(2), 154–161.

Zhang, L., Wang, A., Xie, X., Zhou, Y., Li, J., Yang, L., et al. (2017). Workplace violence against nurses: A cross-sectional study. *International Journal of Nursing Studies, 72*, 8–14.

Zhang, L., You, L., Liu, K., Zheng, J., Fang, J., Lu, M., et al. (2014). The association of Chinese hospital work environment with nurse burnout, job satisfaction, and intention to leave. *Nursing Outlook, 62*(2), 128–137.