

The nursing practice environment and nurse job outcomes: A path analysis of survey data

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Abstract

Aims and objectives: To assess the nursing practice environments and nurse job-related outcomes in two types of hospitals in Saudi Arabia.

Background: The nursing shortage is a challenging problem in Saudi hospitals. Studies have shown that poor practice environments and high patient-to-nurse ratios are associated with poor nurse job outcomes (i.e. job dissatisfaction, burnout and intention to leave) and that can lead to nurse turnover and compound the nursing shortage. However, little research has been conducted on this topic in Saudi Arabia.

Design: A cross-sectional design. A model that links the nursing practice environment and patient-to-nurse ratio to nurse job outcomes was tested through a path analysis of survey data.

Methods: A sample of 404 nurses from public and military hospitals in Saudi Arabia completed a survey that included the Practice Environment Scale of the Nursing Work Index, the Maslach Burnout Inventory and questions related to job dissatisfaction and intention to leave the job. A model of nurse turnover was used to test the relationships among study variables. This study was carried out in accordance with the STROBE checklist for cross-sectional studies.

Results: The nursing practice environment and nurse job outcomes were better in military hospital compared with public hospital. Overall, 53% of participants had high burnout, 39% were dissatisfied, and 26% intended to leave their jobs. The path analysis showed that the nursing practice environment and patient-to-nurse ratio were predictors of burnout and job dissatisfaction, which in turn lead to intention to leave. The tested model had good fit and explained the direct and indirect effects of study variables.

Conclusion: Poor nursing practice environments and high patient-to-nurse ratios contribute to poor nurse job outcomes in Saudi hospitals.

Relevance to clinical practice: Nurse leaders can focus on enhancing practice environments and reducing patient-to-nurse ratios as retention strategies to improve nurse job outcomes.

KEY WORDS

burnout, job satisfaction, nursing, Saudi Arabia, turnover, work environment

1 | INTRODUCTION

The nursing shortage in healthcare facilities is a global problem. A major contributing factor to this problem is nurse turnover, which is often preceded by intention to leave. Reported data have shown that the nurse turnover rate ranges between 12%–21% in European countries, and findings from research in the private sector indicated that the turnover rate of bedside nurses is approximately 14% in the United States (Li & Jones, 2013). In addition to the burden of nurse turnover on healthcare organisations, there is the consumption of hospital resources due to the cost of hiring new nurses and their orientation (Li & Jones, 2013). The estimated cost of registered nurse (RN) turnover reaches up to \$856 million for organisations and ranges between \$1.4–\$2.1 billion for society in general (Brewer, Kovner, Greene, Tukov-shuser, & Djukic, 2011). According to the World Bank, there are 5.7 nurses per 1,000 people in Saudi Arabia, compared with 8.6 nurses per 1,000 people in the United States (The World Bank Group, 2018).

In a study of nurses working in Saudi hospitals, the percentage of nurses who intended to leave was 56% (Bin Saeed, 1995). Another study found that in a public hospital, the turnover rate for staff nurses who spent only 2 years at work reached up to 75% (Alonazi & Omar, 2013). Hiring large numbers of foreign-educated nurses has mitigated but not completely solved the shortage problem. In fact, foreign-educated nurses usually stay temporarily, which aggravates the turnover rate in the long run (Alasmari & Douglas, 2012; Lamadah & Sayed, 2014). High turnover rates in Saudi hospitals warrant close attention and investigation of the possible reasons in order to plan appropriate intervention strategies.

Evidence suggests that in order to reduce nurse turnover, healthcare leaders should pursue retention strategies such as improving the quality of the nursing practice environment. Studies in Western countries, such as the United States, the United Kingdom, Canada, Germany and New Zealand, have demonstrated that favourable practice environments are associated with better job outcomes, including higher job satisfaction, less burnout and less intention to leave the job (factor which often precedes turnover) (Aiken et al., 2012; Ganz & Toren, 2014; Hinno, Partanen, & Vehviläinen-Julkunen, 2012; Lee, Kim, Kang, Yoon, & Kim, 2014; Leone et al., 2015; Li et al., 2013; Shang, Friese, Wu, & Aiken, 2013). These results were consistent with studies conducted in Far Eastern countries (Liu et al., 2012; You et al., 2013; Zhang et al., 2014). The empirical evidence from studies worldwide should convince nurse leaders and policy-makers to implement efforts to modify the practice environment to improve nurse outcomes and reduce turnover. Prior to modification, it is necessary to assess the quality of the current practice environments in different Saudi hospitals to identify the conditions that need improvement for efficient resource allocation.

What does this paper contribute to the wider global clinical community?

- Poor nurse job outcomes are attributed to poor practice environments and high patient-to-nurse ratios. Leaders can focus their efforts on modifying these organisational factors to improve job outcomes and increase nurse retention.
- Job dissatisfaction and burnout are predictors of intention to leave and have a mediating role in the relationship between the practice environment and intention to leave. Hospital leaders can address intention to leave by assessing their practice environments and planning to reduce their negative impact. Improvements in this area may also improve patient outcomes.

2 | BACKGROUND

Numerous studies on nurse job outcomes and turnover have focused on work environment and staffing (i.e. patient-to-nurse ratio) as major influential and modifiable factors (Heinen et al., 2013; Leone et al., 2015; Nantsupawat, Nantsupawat, Kulnaviktikul, & McHugh, 2015). The nursing practice environment is defined as “the organizational characteristics of a work setting that facilitate or constrain professional nursing practice” (Lake, 2002). Over the past decade, numerous studies have investigated the role of the nursing practice environment on patient, nurse and organisational outcomes. Poor practice environments were found to have negative consequences not only on nurses, but also on patients (Friese, Lake, Aiken, Silber, & Sochalski, 2008; Swiger et al., 2017; Warshawsky & Havens, 2011). Studies conducted in Western and some Eastern countries have assessed different work units, such as psychiatric, oncology, haemodialysis, medical and surgical units (Friese, 2005; Friese et al., 2008; Hanrahan, Aiken, McClaine, & Hanlon, 2010; Lee et al., 2014). The results consistently indicate a need for good practice environments to improve patient, nurse and organisational outcomes. However, research is needed to determine whether we can generalise these results to Saudi hospitals, which has a different workforce structure that is composed of a large portion of expatriate nurses and different operation systems that are designed for the Saudi culture.

Aspects of the nursing practice environment are modifiable; thus, such modifications may serve as a viable solution to reducing nurse turnover in Saudi hospitals. Practice environments, however, may vary across hospitals depending on hospital ownership. Saudi hospitals are owned and operated by one of three types of organisations: governmental (public) hospitals (operated and funded

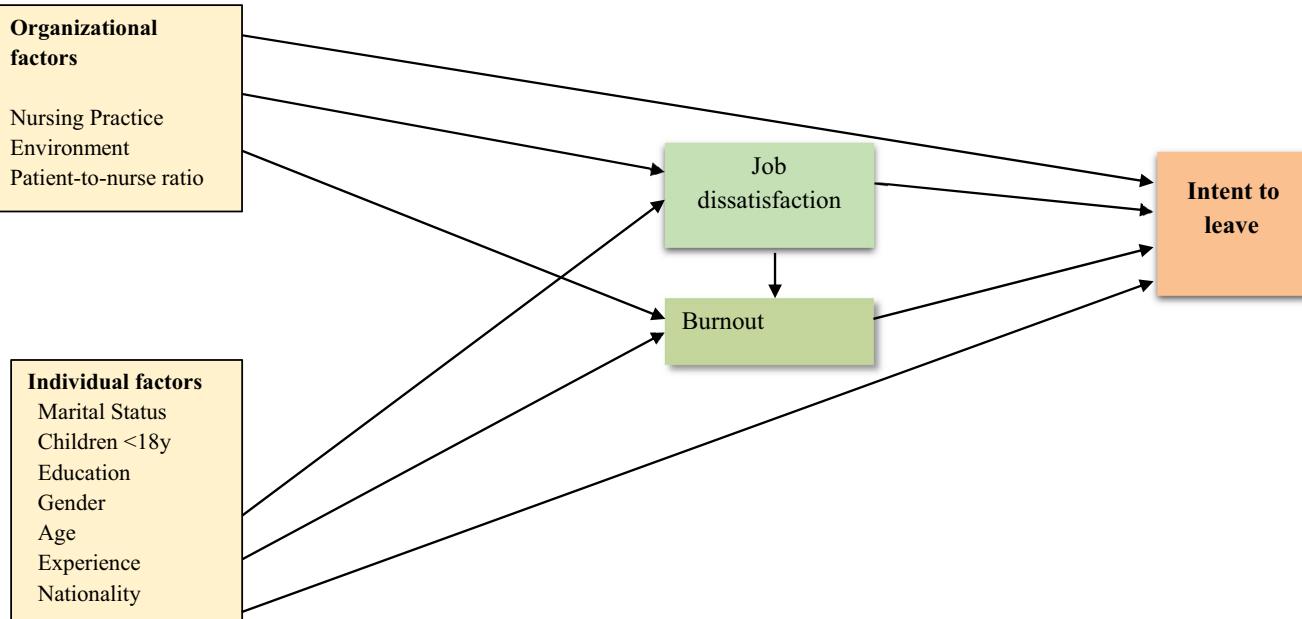


FIGURE 1 The modified model for nurse turnover [Colour figure can be viewed at wileyonlinelibrary.com]

by the Ministry of Health); other governmental facilities (operated by militaries, universities, or other ministries); and private hospitals (owned by private sector companies). The differences in ownership and operational systems and resources among different hospital types may influence their practice environments. Additionally, the relationship between the practice environment and nurse job outcomes may be influenced by workforce composition and contractual employment relationships. Therefore, we included two types of hospitals (public and military) in our assessment of practice environments.

The patient-to-nurse ratio is used to assess the adequacy of nursing staff to provide quality care for patients during a shift. Inadequacy of staff increases the workload on nurses causing them to feel more stressed and burned out (Heinen et al., 2013; Kunaviktikul et al., 2015). In a systematic review, Toh, Ang, and Devi (2012) showed that staffing inadequacy leads to job dissatisfaction and burnout, which ultimately leads to turnover.

Nurse job outcomes are a topic of interest to both nurses and managers due to the shared desire for a satisfied, productive workforce. Nurse job outcomes in this study refer to job dissatisfaction, burnout and intention to leave. Job dissatisfaction is a subjective variable that depends on the nature of the job and individual expectations regarding the job (Ramoo, Abdullah, & Piaw, 2013). In general, several intrinsic and extrinsic factors may contribute to job satisfaction, such as an individual's sense of personal achievement, salary, working conditions and available resources (Zaghoul, Al-Hussaini, & Al-Bassam, 2008). Organisational factors that have been found to negatively impact nurse satisfaction in Saudi hospitals include opportunities for promotion, workload and stressful work environments (Alotaibi, Paliadelis, & Valenzuela, 2015). Burnout is an emotional state that often occurs in human services work that is characterised by emotional

exhaustion, depersonalisation and low personal accomplishment (Maslach, Jackson, & Leiter, 1996). Poor quality work environments have been found to be significantly associated with high levels of burnout in Saudi and non-Saudi samples of nurses (Alsaqri, 2014; Lang, Patrician, & Steele, 2012; Leiter & Spence Laschinger, 2006). Other contributing factors include work overload and job stress (Alsaqri, 2014; Lang et al., 2012), and job dissatisfaction, which have been linked to burnout (Lake, 1998; Van Bogaert, Clarke, Roelant, Meulemans, & Heyning, 2010; Van Bogaert, Meulemans, Clarke, Vermeyen, & Heyning, 2009).

Intention to leave is the plan to leave the current job within the next year. The assessment of the practice environment and its relationship to job outcomes in Saudi hospitals is necessary to design effective and efficient future interventions to reduce nurse intention to leave, which often precedes turnover.

This study was designed to explore the determinants of nurse job outcomes, particularly nurses' intention to leave, in Saudi hospitals and to assess whether the relationship between the practice environment and job outcomes is consistent with findings from studies conducted in other countries. We examined two types of potential factors: individual factors and organisational factors (i.e. the practice environment and the patient-to-nurse ratio). Saudi Arabia faces persistent nurse shortages and has a large but unevenly distributed segment of foreign-educated nurses in the hospital sectors. These contextual differences warrant research that informs management and policy decisions in this country and countries with similar workforce issues. Despite the extent of nurse turnover and shortages in Saudi hospitals, no published studies have investigated the relationship between the practice environment and nurse job outcomes in the region, nor have there been studies that assess the quality of the practice environment in Saudi hospitals.

3 | CONCEPTUAL FRAMEWORK

Lake's Model of Nurse Turnover (1998) was adopted as the conceptual framework of this study. Lake's model focuses on the direct and indirect effects of individual and organisational factors, job opportunities, and clinical autonomy, and the affective responses to the job (satisfaction, job-related stress and burnout) on intention to leave, which ultimately leads to resignation (turnover). This study was conducted to examine the impacts of both individual and organisational factors on job dissatisfaction and burnout and to test whether these responses lead to nurse intention to leave. In our model, individual factors included age, gender, marital status, number of children aged <18 years, level of education, years of experience and nationality. Organisational factors included nursing practice environment and patient-to-nurse ratio (i.e. the number of patients assigned to the nurse during the shift). These variables were based on Lake's model (see Figure 1). We also considered a path from job dissatisfaction to burnout, based on supporting literature that demonstrated this relationship (Lake, 1998; Van Bogaert et al., 2009, 2010). A logistic regression analysis showed that patient-to-nurse ratio was not a significant predictor of intention to leave. Therefore, patient-to-nurse ratio was included as an indicator of burnout and job dissatisfaction, but not of intention to leave in our path analysis.

4 | AIMS

The aims of this study were (a) to describe and compare the nurse practice environment, patient-to-nurse ratio and nurse job outcomes (i.e. job dissatisfaction, burnout and intention to leave) of a public and a military hospital in Saudi Arabia; and (b) to examine the relationships among nursing practice environment, patient-to-nurse ratio, hospital type and nurse job-related outcomes, in the presence of potential confounding factors at the individual level, using path analysis. Based on the higher financial resources and large number of nurses with Bachelor of Science in Nursing (BSN) degrees in military hospitals, compared with public hospitals, we expected that the practice environment and patient-to-nurse ratio would be better in the military hospital. Consequently, we expect the nurse job outcomes to also be better in the military hospital (similar to previous literature). Therefore, our initial hypotheses were as follows:

- A1: The practice environment score is higher and the patient-to-nurse-ratio is lower in the military hospital, compared with the public hospital.
- A2: Nurse job outcomes are better in the military hospital, compared with the public hospital.
- A3: There is a positive association between the quality of the practice environment and nurse job outcomes.
- A4: A high patient-to-nurse ratio is associated with poor nurse job outcomes.
- A5: Job dissatisfaction and burnout mediate the relationship between the practice environment and intention to leave.

5 | METHODS

This study was carried out in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist for cross-sectional studies, developed by the EQUATOR Network (Enhancing the Quality and Transparency Of health Research) (See Appendix S1).

5.1 | Design

A cross-sectional design was employed to collect responses from nurses at two hospitals in Saudi Arabia: a 300-bed military hospital and a 360-bed public (governmental) hospital.

5.2 | Participants

Convenience sampling was used to collect data from Saudi- and foreign-educated nurses who worked at both hospitals. The inclusion criteria were as follows: staff nurses who (a) worked at least 6 months at their current jobs, (b) worked at patients' bedsides, (c) worked in inpatient units, (d) understood Arabic or English and (e) had complete data on the key variables. To perform a path analysis, it is recommended to have at least 10 to 20 participants for each parameter to be estimated (Kline, 2011). Based on the planned parameters in this analysis, a sample size of 320 nurses was determined to be acceptable.

5.3 | Data collection

The study survey was distributed electronically and anonymously to all nursing staff working in inpatient units of both hospitals in November 2016. Nursing staff included staff nurses and nurse aides. Data collection was carried out over 4 weeks. Initially, the public hospital had a low response rate. Therefore, paper surveys were distributed to collect a sufficient number of responses. Of the 979 surveys distributed in both settings, 624 surveys were collected (320 from the public hospital and 304 from the military hospital), yielding response rates of 56% and 71%, respectively. Based on the inclusion criteria, the final sample size was 404 nurses: 195 nurses from the public hospital and 209 from the military hospital.

The survey consists of the following sections:

5.3.1 | Demographic data

Age, gender, nationality (Saudi, from another Arab country, from another Asian country, or from a Western country), marital status (single, married, divorced, or widowed), number of children aged <18 years (0, 1, 2, 3, or more), level of education (diploma, BSN, or

master's or higher degree) and years of experience (<2, 2 to 5, 6 to 10, or more than 10).

5.3.2 | Nursing practice environment

The nursing practice environment was assessed using the Practice Environment Scale of the Nursing Work Index (PES-NWI) (Lake, 2002). The scale is composed of five subscales: *nurse participation in hospital affairs* (nine items); *nursing foundations for quality of care* (10 items); *nurse manager ability, leadership and support of nurses* (five items); *staffing and resource adequacy* (four items); and *collegial nurse–physician relations* (three items). Each subscale measures one supportive aspect in the practice environment that helps nurses in the provision of care. Responses for each item are on a 4-point Likert scale that ranges from 1 ("strongly agree")–4 ("strongly disagree"). The responses must be reverse-coded prior to the analysis so that the higher scores indicate a better practice environment and vice versa. Any subscale with a score of 2.5 or higher indicates a favourable practice environment (Lake, 2002). The composite score for the practice environment is calculated as the mean of the five subscale scores. Consistent with other studies, an environment was classified as unfavourable if it had 0 to 1 subscales scored above 2.5, mixed if it had two or three subscales above 2.5 and favourable if it had four or five subscales above 2.5. (Friese, 2005; Friese et al., 2008; Patrician, Shang, & Lake, 2010).

5.3.3 | Burnout

Burnout was assessed with the Emotional Exhaustion subscale of the Maslach Burnout Inventory-Human Services Survey (MBI-HSS), which has nine items that measure the frequency of some job-related feelings. The responses range from 1 ("never")–7 ("every day"). For healthcare workers, a burnout score of 27 or above is considered high (Maslach et al., 1996). The burnout score is obtained by summing the scores on each of the nine items. The burnout level corresponds to the total score. Scores from 0–16 indicate low burnout, 17 to 26 indicate moderate burnout and above 26 indicate high burnout (Maslach & Jackson, 1986).

5.3.4 | Job dissatisfaction

A single item asked nurses to rate their dissatisfaction on a scale with responses ranging from "very satisfied" (=1)–"very dissatisfied" (=4). In the analysis, scores of 1 and 2 were categorised as satisfied, and scores of 3 and 4 were categorised as dissatisfied.

5.3.5 | Intention to leave

A single item asked nurses whether they planned to leave their jobs within a year. Possible responses were "Yes" or "No."

5.3.6 | Patient-to-nurse ratio

A single item asked nurses to state their number of assigned patients in the last shift worked.

5.4 | Ethical considerations

This study was approved by the ethics committee of the public hospital (number QCHR-SREC0057) and by the institutional review board of the military hospital (number SP16/273/A). Prior approval was also obtained from the institutional review board of the first author's affiliated university (Approval 826143). Permission to use the MBI-HSS and the PES-NWI was also obtained from the developers of both instruments. The consent forms were administered in English and Arabic to ensure understanding by all participants (Saudi and non-Saudi nurses).

5.5 | Validity, reliability and rigour

The sample was composed of Saudi and non-Saudi nurses. Although all the nurses could understand English, not all participants were fluent in the language. We decided to administer the study survey in Arabic and English to enhance understanding of all questions. We followed the systematic process of instrument translation for multi-country comparative health workforce studies (Squires et al., 2013). This process requires forward and backward translation and checking the relevancy and accuracy of translated items and the content validity index. The content validity index was yielded from responses from 10 bilingual experts (raters) who rated the items for clarity and relevancy to the Saudi context. The original translated version was modified slightly based on the quantitative and qualitative feedback from experts before distributing the survey to participants.

The two major components of the study survey were the PES-NWI and MBI-HSS. Job dissatisfaction, patient-to-nurse ratio and intention to leave were assessed by a single question each. The PES-NWI has been validated through international studies, and the scale showed sound content and construct validity (Warshawsky & Havens, 2011). The reliability was reported as Cronbach's α of .82 for the entire scale, and it ranged between 0.71–0.84 for the individual subscales (Lake, 2002). In another study (Patrician et al., 2010), these values were 0.94 for the entire scale and between 0.82–0.87 for the subscales, indicating good psychometric properties. For our study sample, Cronbach's alpha for the PES-NWI was 0.91 for the entire scale and between 0.75–0.91 for the individual subscales, which indicates good reliability.

The MBI-HSS is the most commonly used instrument in the assessment of burnout due to its utility and stability, which was evident across many samples in different countries (Poghosyan, Aiken, & Sloane, 2009). In particular, the Emotional Exhaustion subscale of the MBI-HSS was used in numerous studies to assess burnout among healthcare workers (Aiken et al., 2011; Heinen et al., 2013; Liu et al., 2012; You et al., 2013). Previous studies have reported

the reliability (Cronbach's alpha) of this subscale to be between 0.85–0.91. For our sample, Cronbach's alpha for this subscale was .95, indicating high reliability.

5.6 | Data analysis

Descriptive and inferential statistics were used to address the study hypotheses. Statistical analysis was conducted with SAS 9.4 (SAS Institute Inc.) and SPSS 24 software (IBM Corporation). Descriptive statistics (mean, median and standard deviation [SD]) were used to display the distribution of study variables in the overall sample ($n = 404$) and by hospital (two groups). Additionally, the significance of the differences between the two groups was tested using the chi-square statistic for categorical data, and the two-sample t test for continuous data. When the variance was mismatched between the two groups, Welch's t test was used.

A path analysis was conducted (using Mplus 7 software [Muthén & Muthén, Los Angeles, CA, USA]) to test our conceptual model that links individual and organisational factors to nurse job outcomes (i.e. job dissatisfaction, burnout and intention to leave) using the entire sample ($n = 404$). When using path analysis, a researcher can determine direct and indirect relationships among a set of variables simultaneously and compare several models based on their fit indices (Stage, Carter, & Nora, 2004). A good model has the following fit indices: (a) nonsignificant chi-square statistics (although it is sensitive to sample size if it is > 200), (b) root mean square error of approximation (RMSEA) ≤ 0.05 (value of $<.08$ is acceptable), (c) comparative fit index (CFI) and Tucker-Lewis index (TLI) > 0.90 , standardised root mean square residual (SRMR) ≤ 0.08 and root mean square residual (WRMR) ≤ 1.0 (Kline, 2011). In our model, we hypothesised that individual and organisational factors have direct and indirect effects (through dissatisfaction and burnout) on nurse intention to leave (see Figure 1). Missing data did not exceed 3.3% of the values of each variable, and based on the analysis, they were missing at random (not in a specific pattern). The missing data were handled using multiple imputation.

6 | RESULTS

6.1 | Sample characteristics and individual factors

Most of the nurses in the study sample were women (91%). The percentage of nurses who were Saudi nationals differed significantly between the hospitals. Eighty-three per cent of the nurses at the public hospital were Saudi nationals, whereas only 4% at the military hospital were Saudi nationals. At both hospitals, the majority of participants worked in medical/surgical units, followed by intensive care units. The remaining units differed. For example, in the public hospital, units included haematology and burn units, whereas in the military hospital, they included haemodialysis, long-term care and oncology. A considerable percentage of nurses in the public hospital

were younger (98% were aged 40 years or less versus 56% in the military hospital), less experienced (only 22.5% had more than 10 years of experience versus 53% in the military hospital) and less educated (only 37% were BSN graduates in the public hospital versus 82% in the military hospital). Statistically significant differences were observed for sex, age, marital status, education, experience, nationality and unit type (see Table 1).

6.2 | Organisational factors

6.2.1 | Nursing practice environment

Among the entire sample (public and military hospitals), practice environments in Saudi hospitals were rated overall as 2.66 out of 4 (sample composite score). This indicates a slight tendency to agree that valued organisational traits were present in the current job given that 2.5 is the midpoint between 2.0 ("agree")–3.0 ("disagree"). The highest rated subscales were *nursing foundations for quality of care* (mean = 2.82, SD = 0.54) and *collegial nurse-physician relations* (mean = 2.80, SD = 0.55). The lowest rated subscales were *staffing and resource adequacy* (mean = 2.49, SD = 0.73) and *nurse participation in hospital affairs* (mean = 2.52, SD = 0.65).

Assessment of the practice environments of the hospitals showed that all PES-NWI subscales and composite scores were significantly lower for the public hospital. Notably, the composite score for the public hospital was 2.28, indicating that nurses tended to disagree that the valued traits were present, whereas the score was 3.00 for the military hospital, indicating that the nurses agreed that the traits were present. Based on the classification criteria (described earlier), the practice environment of the public hospital was rated as unfavourable (i.e. only one subscale was scored >2.5), whereas the practice environment of the military hospital was rated as favourable. For the military hospital, all five subscales were scored >2.5 (see Table 2). Analysis of the two independent samples test with unequal variance (Welch's t test) showed significant difference among the two hospitals ($p \leq .0001$).

6.2.2 | Patient-to-nurse ratio (staffing)

Sample-wide, nurses cared for an average of 5.24 patients. This ratio was significantly higher in the public hospital, with nurses averaging 1.62 more patients than those in the military hospital (see Table 2). These results on practice environment and patient-to-nurse ratio support hypothesis A1.

6.3 | Job outcomes

Approximately 39% of all nurses in the entire sample were dissatisfied with their jobs, 52% reported high burnout and 74% intended to leave their jobs within a year (see Table 3). Outcomes differed markedly

TABLE 1 Characteristics of the study sample

Characteristics	Entire sample N = 404 n (%)	Public hospital N = 209 n (%)	Military hospital N = 195 n (%)	p-Value
Age (years)	<.0001			
20-30	136 (34.00)	96 (50.26)	40 (19.14)	
31-40	168 (42)	91 (47.65)	77 (36.84)	
41 and older	96 (24.00)	4 (2.09)	92 (44.02)	
Number of children < 18	.3432			
None	170 (42.50)	77 (40.31)	93 (44.50)	
One or more	230 (57.50)	114 (59.68)	116 (55.51)	
Experience (years)	<.0001*			
<2 years	23 (5.75)	19 (9.95)	4 (1.91)	
2 to 5 years	89 (22.25)	56 (29.32)	33 (15.79)	
6 to 10 years	134 (33.50)	73 (38.22)	61 (29.19)	
More than 10 years	154 (38.50)	43 (22.51)	111 (53.11)	
Sex	.0164			
Female	363 (90.98)	166 (87.37)	197 (94.26)	
Male	36 (9.02)	24 (12.63)	12 (5.74)	
Marital status	.0236			
Single	115 (28.89)	47 (24.87)	68 (32.54)	
Married	264 (66.33)	137 (72.49)	127 (60.77)	
Widow/divorced	19 (4.77)	5 (2.65)	14 (6.70)	
Nationality	<.0001			
Saudi	169 (42.04)	161 (83.42)	8 (3.83)	
Non-Saudi	233 (57.96)	32 (16.58)	201 (96.17)	
Education	<.0001*			
Diploma	153 (38.06)	118 (61.14)	35 (16.75)	
BSN or higher	249 (61.94)	75 (40.86)	174 (83.26)	

Note: Statistics for comparing the two groups of nurses. p-value indicates the test of significance based on chi-squares for categorical variables.

*Indicates the p-value is based on Fisher's exact test due to low count in some cells.

between the two hospitals. More than 80% of nurses in the public hospital reported a high level of burnout, 65% were dissatisfied with their jobs and 33% intended to leave. In comparison, in the military hospital, 26% of the nurses surveyed had high burnout. Sixteen per cent were dissatisfied with their jobs and 19% intended to leave. The chi-square for the difference between the job outcomes for the two groups was statistically significant ($p \leq .001$) for all outcomes. These results support hypothesis A2.

6.4 | Results of the path analysis

Several models were tested to find the best model. The major criteria for model selection were as follows: (a) a correct theoretical basis (accurate model specification); (b) adequate or good fit indices; and (c) directionality of the path coefficients of the model confirmed by bivariate logistic or linear regression analysis. The first model included "hospital type" as a predictor variable along with practice environment and individual factors. However, it showed poor fit indices, and

the directionality of the path coefficients of the results opposed the results of the logistic regression we had performed initially to find the significant predictors. Therefore, the model was not acceptable.

Path analysis results of the tested model (see Figure 2) revealed good fit indices (chi-square = 0.673, degrees of freedom = 1, p -value = .41; root mean square error of approximation (RMSEA) = 0.00; comparative fit index (CFI) = 1.00; Tucker-Lewis index (TLI) = 1.093; weighted root mean square residual (WRMR) = 0.094). As shown in Figure 2, there was partial support for hypothesis A3: a positive association between the quality of the practice environment and nurse job outcomes as indicated by a positive regression coefficient. The results showed statistical significance (indicated by bold numbers of the regression coefficients) between the practice environment, job dissatisfaction and burnout. Nurses working at the hospital with higher nursing practice environment scores (the military hospital) reported lower job dissatisfaction and burnout; however, there was no direct significant effect of the practice environment on intention to leave. Additionally, there was partial support for hypothesis A4; that

TABLE 2 Statistics of the practice environment scores and patient-to-nurse ratio based on the entire sample and by hospital

Variable	Mean (SD)	Entire sample N = 404	Public hospital N = 195	Military hospital N = 209	p-Value
Practice environment					
Nurse participation in hospital affairs	2.52 (0.65)	2.11 (0.62)	2.89 (0.43)	<.0001	
Nursing foundations for quality of care	2.82 (0.54)	2.46 (0.50)	3.15 (0.34)	<.0001	
Nurse manager ability, leadership and support of nurses	2.70 (0.69)	2.34 (0.69)	3.02 (0.51)	<.0001	
Staffing and resource adequacy	2.49 (0.73)	1.99 (0.63)	2.93 (0.50)	<.0001	
Collegial nurse–physician relations	2.80 (0.55)	2.54 (0.58)	3.03 (0.39)	<.0001	
Composite score at nurse level	2.66 (0.55)	2.28 (0.48)	3.00 (0.35)	<.0001	
Patient-to-nurse ratio	5.24 (2.90)	6.12 (3.24)	4.50 (2.33)	<.0001	

Note: p-Value indicates the test of significance based on the comparison of two independent samples test with unequal variance (Welch's t test).

TABLE 3 Distribution of nurse job outcomes overall and by hospital type

Variable	Entire sample N = 404	Public hospital N = 195	Military hospital N = 209	p-Value
Job dissatisfaction, n (%) ^a				
Satisfied	241 (61.3)	65 (35.3)	176 (84.2)	<.001
Dissatisfied	152 (38.7)	119 (64.7)	33 (15.8)	
Burnout, n (%)				
Low (0–16)	110 (28.1)	18 (9.8)	92 (44.2)	<.0001
Moderate (17–26)	79 (20.2)	17 (9.3)	62 (29.8)	
High (27 or over)	202 (51.7)	148 (80.9)	54 (26.0)	
Burnout score ^a				
Mean (SD)	28.64 (16.4)	39.17 (14.2)	19.38 (12.0)	<.0001
Intention to leave, n (%) ^a				
Yes	101 (25.8)	61 (33.2)	40 (19.2)	.0017
No	291 (74.2)	123 (66.9)	168 (80.8)	

Note: Descriptive statistics (n = 404) based on entire sample and by hospital type; p-value indicates the test of significance based on chi-square for categorical variables (job dissatisfaction, burnout level and intention to leave). For burnout score (continuous variable), p-value is based on the comparison of two independent samples test with unequal variance (Welch's t test).

^aVariables used in path analysis.

is, a high patient-to-nurse ratio was associated with poor nurse job outcomes. Patient-to-nurse ratio had a significant impact on burnout score (regression coefficient = .03, p-value = .024) but not on job dissatisfaction.

Finally, hypothesis A5 was supported. The practice environment score correlated negatively with job dissatisfaction (regression coefficient = -1.15, p-value < .001) and burnout (regression coefficient = -.36, p-value < .01). Burnout and job dissatisfaction

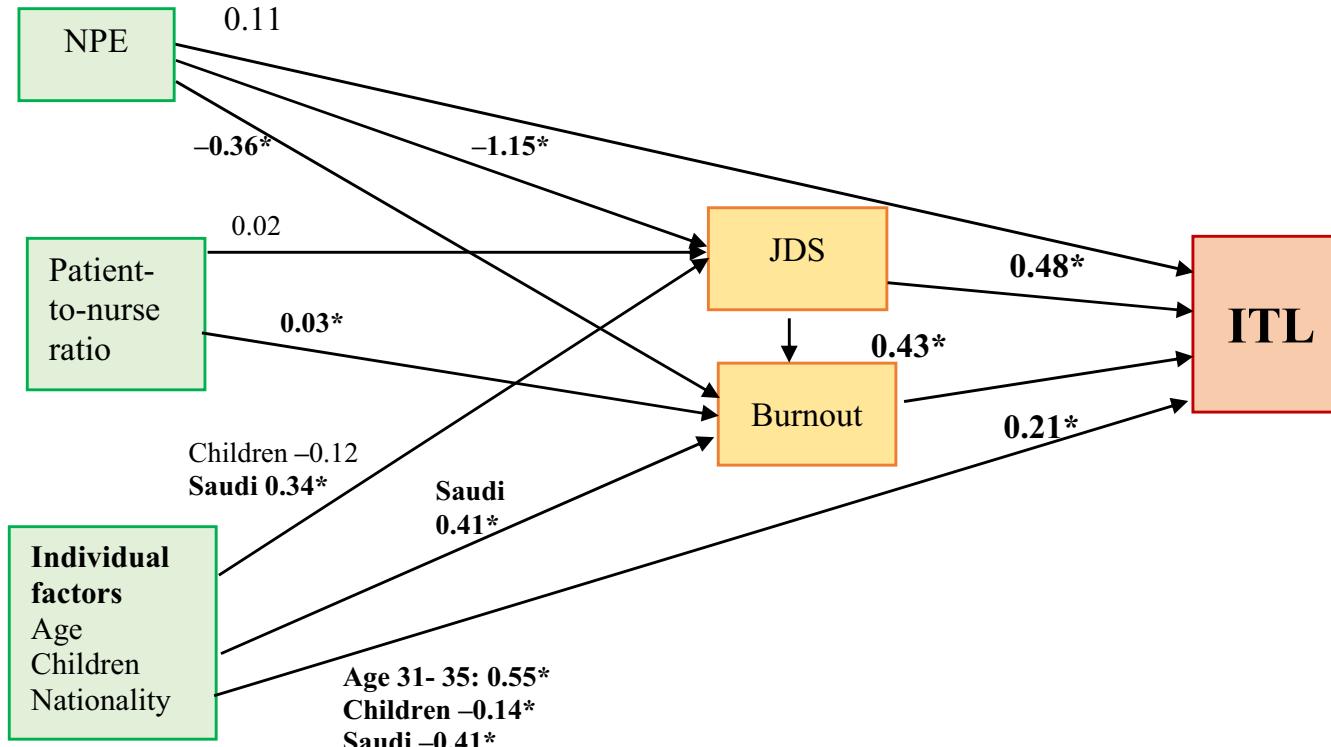


FIGURE 2 Path analysis results of the modified model showing the significant outcomes. Note: NPE, nursing practice environment; JDS, job dissatisfaction; ITL, intent to leave. *indicates significant regression coefficient [Colour figure can be viewed at wileyonlinelibrary.com]

were significant predictors of intention to leave (regression coefficient = .21, *p*-value = .04; and regression coefficient = .48, *p*-value < .001), and job dissatisfaction had a significant impact on burnout (regression coefficient = .43, *p*-value = .001). Although the direct effect of the nursing practice environment on intention to leave was not significant, the practice environment had two significant paths that go indirectly through job dissatisfaction and burnout, resulting in intention to leave.

Some individual factors played a role in shaping the relationship among practice environment, patient-to-nurse ratio and nurse job outcomes. Saudi nurses reported higher job dissatisfaction and burnout (regression coefficient = .34, *p*-value < .05; regression coefficient = .41, *p*-value < .001, respectively), but less intention to leave (regression coefficient = -.41, *p*-value = .03). Survey participants with children aged <18 years were less dissatisfied (regression coefficient = -.12, *p*-value = .06) and had less intention to leave (regression coefficient = -.14, *p*-value = .05) than those without children. Participants aged between 31–35 years reported higher intention to leave than older nurses (regression coefficient = .55, *p*-value = .03).

7 | DISCUSSION

The path analysis results showed that nurse job dissatisfaction and burnout were the main determinants of intention to leave among bedside nurses even after accounting for individual factors. Job

outcomes were influenced by practice environments and patient-to-nurse ratios. This conclusion was evident from the significant correlation between poor practice environment scores and poor job outcomes (job dissatisfaction and burnout), and the significant correlation between patient-to-nurse ratio and burnout in the total sample.

Notably, significant differences in practice environment scores and patient-to-nurse ratios were demonstrated across hospital types, which subsequently resulted in the variation in job outcomes. Approximately half of the nurses in the sample reported a high burnout level. Three-quarters of them worked in the public hospital where the practice environment was poorer, and the patient-to-nurse ratio was higher (reaching up to 9 patients per nurse) than that of the military hospital. Additionally, almost 65% of the public hospital nurses were dissatisfied with their jobs, and 33% had intention to leave, compared with 16% and 19%, respectively, in the military hospital. The poor practice environment in the public hospital was evident from the low scores on all PES-NWI subscales and the composite score. A poor practice environment indirectly increases nurses' intention to leave through its effect on burnout and job dissatisfaction (Figure 2). This result supports the study hypothesis (A5) that job dissatisfaction and burnout mediate the relationship between practice environment and intention to leave.

The poorer job outcomes in the public hospital are a cause for concern because they indicate a greater instability in that workforce; that is, the high percentage of nurses who intend to leave can lead to poorer patient outcomes. The combination of poor practice

environment and high patient-to-nurse ratio warrants attention from nurse leaders and policy-makers, in order to prevent their potential negative impact on nurses and patient outcomes (Aiken et al., 2012).

Our findings added data from Saudi Arabia to the growing knowledge base on nurse job outcomes internationally. In our sample, the percentage of dissatisfied nurses (39%) was comparable to the percentages found in similar studies in Canada, England and New Zealand (33%, 37% and 33%, respectively), but was lower than percentages found in studies in China and Japan (46% and 60%, respectively) (Aiken et al., 2011). Furthermore, the percentage of nurses who reported high burnout (51.66%) in this study was notably higher than those reported in the United States, Canada, England, China, Thailand, New Zealand and Germany, but it did not exceed the percentages reported from South Korea (60%) and Japan (58%) (Aiken et al., 2011).

In this study, the lowest practice environment subscale score was observed for *staffing and resource adequacy*, followed by *nurse participation in hospital affairs*. These rankings are consistent with evidence from 22 studies reviewed in Warshawsky and Havens (2011). Multiple possible reasons exist for the comparatively lower scores in the public hospital than in the military hospital. One possible reason is that fewer financial resources are available to the Ministry of Health, which oversees 414 public hospitals. Public hospitals are used by large numbers of patients who seek free medical care, and there are an insufficient number of qualified nurses available to handle the patients' needs. These contextual factors likely account for the high patient-to-nurse ratio and lower scores on the *staffing and resources adequacy* subscale. High patient-to-nurse ratios in this study were a significant predictor of burnout. These relationships are consistent with evidence from other countries (Fries, 2005; Hanrahan et al., 2010; Lang et al., 2012; Leiter & Spence Laschinger, 2006; Warshawsky & Havens, 2011).

With regard to the individual factors, Saudi nurses reported higher job dissatisfaction and more burnout compared with foreign-educated nurses; however, Saudi nurses had less intention to leave their jobs. This finding is most likely due to a lack of job opportunities, a situation that is especially true for nurses who hold a nursing diploma. In Saudi Arabia, the nursing diploma is a degree less than a baccalaureate degree. Nursing diploma programmes are 2-year programmes that focus on nursing technical skills. These programmes are no longer recommended or attractive to employers due to the development of the Bachelor of Nursing programmes. Having more children was found to be associated with less job dissatisfaction and less intention to leave, consistent with Lake's findings (1998). Nurses aged between 31–35 years reported more intention to leave compared with older nurses (aged 40 years or more). This finding is also consistent with those of studies from several other countries where nurses in this age group are more likely to leave their jobs than nurses in other age groups (Aiken et al., 2011). Other individual factors such as education, experience and marital status had no significant effect on nurse job outcomes in this sample.

The alarming findings of high job dissatisfaction and burnout among Saudi national nurses warrant close attention from health leaders and policy-makers in Saudi Arabia. These poor job outcomes are

predictors of intention to leave and, eventually, of an increased turnover rate. It is crucial that hospitals find strategies to increase nurse retention in order to meet the needs of the growing population. Based on this study's findings, Saudi hospitals have problems related to poor work conditions. However, these conditions are modifiable, and if they are improved, the job outcomes may consequently improve as well.

Improvements are primarily needed in *staffing and resource adequacy*, followed by *nurse participation in hospital affairs*. Nurses, especially those working in public hospitals, care for a high number of patients every shift, which was evident from the high patient-to-nurse ratio. To overcome the inadequacies in staffing and resources, nurses often perform administrative tasks in the units that are not part of nursing care. To improve staffing and resource adequacy and to relieve some of the burden on nurses, hospital leaders should work on increasing the support staff (i.e. human resources). This will give nurses more time to provide nursing care, which will make their work more satisfying. Additionally, a wise allocation of financial resources is important to ensure the availability of necessary resources for patients and nurses. For instance, some hospitals spend large parts of the budget on the conduction of conferences while the basic equipment and devices in the units are lacking. Other hospitals avoid recruiting new nurses or support staff due to restricted budgets. However, they end up with heavier nurse workloads and, eventually, a high turnover rate, which exacerbates the shortage. Recruiting new registered nurses or support staff such as nurse aides is a great investment towards minimising the workload of nurses, and this workload is a primary reason for physical and emotional exhaustion and job dissatisfaction (Salem, Al-Maabadi, & Baddar, 2019).

In this study, *nurse participation in hospital affairs* was scored low, indicating that the nurses did not have enough opportunities to participate in the decision-making in their hospitals. Nurse managers and directors in Saudi hospitals can improve this situation by giving nurses more authority, involving them in the decision-making process and listening to their opinions and suggestions. Additionally, encouraging nurses to improve their knowledge and experience by attending workshops and participating in staff development activities would empower nurses and prepare them to be good participants and effective decision-makers. More involvement in these processes would likely increase job satisfaction and reduce intention to leave among nurses.

7.1 | Recommendations

Future research on the practice environment and nurse job outcomes in Saudi Arabia should include larger hospital samples with varying hospital types to provide more generalisable results. Additionally, use of the Arabic version of the PES-NWI is encouraged in Arabic-speaking countries to generate valid and reliable evidence. More research is needed to identify approaches to improve practice environments in resource-constrained settings. Lastly, the relationship between poor practice environments and patient outcomes in Saudi hospitals must be investigated as these conditions have been linked

to patient dissatisfaction and threaten patient outcomes, as was evident in other studies (Aiken, Clarke, Sloane, Lake, & Cheney, 2008; Patrician et al., 2010; Swiger et al., 2017).

7.2 | Strengths

This study was the first to investigate the relationship between practice environment, patient-to-nurse ratio and nurse job outcomes in Saudi hospitals. It provides fundamental knowledge on the quality of practice environments. Path analysis, which is uncommon in this area of inquiry, was suitable to explore the direct and indirect effects of the variables and yielded a more nuanced understanding of these observed relationships (Li et al., 2013; Van Bogaert et al., 2013; Van Bogaert, Van Heusden, Timmermans, & Franck, 2014). This study also contributes to the international evidence on the psychometric properties of the PES-NWI (Swiger et al., 2017; Warshawsky & Havens, 2011).

7.3 | Limitations

The use of a cross-sectional design restricts the establishment of causal links between the independent and dependent variables. Furthermore, the two hospitals in this study may not represent all Saudi hospitals, and this limits the generalisability of the findings.

7.4 | Implications

Our findings provide evidence of the utility of the conceptual framework we tested and the relationships between organisational factors and nurse job outcomes. Additionally, it provides fundamental knowledge on the quality of the practice environment and nurse job outcomes in Saudi hospitals. Nurse managers and leaders are urged to use this knowledge when identifying aspects of practice environments that need improvement, in order to use resources more efficiently and to make evidence-based decisions regarding future plans and interventions. Nurse managers can modify and improve some aspects of the practice environment. For example, they can allow nurses to participate in policy decisions and advocate for more bedside nurses to reduce workload and to improve patient care. Nurse job outcomes of the public hospital, specifically the burnout level, are alarming and require immediate attention from leaders at the hospital and at the Ministry of Health. Additionally, nurse managers in units with high intention to leave should discuss the reasons for such intentions with their staff and bring their concerns to upper management in order to find solutions.

8 | CONCLUSION

The tested model was grounded in a conceptual framework that had been derived from previous empirical findings. This model appears to

explain the direct and indirect effects of individual and organisational factors on nurse job outcomes. Although some of these relationships were evident from international studies, the present analysis revealed the role of mediating effects of job dissatisfaction and burnout on nurses' intention to leave their jobs. Additionally, study results demonstrated the variation in the quality of practice environments, patient-to-nurse ratio and nurse job outcomes (i.e. job dissatisfaction, burnout and intention to leave) in two types of hospitals in Saudi Arabia (i.e. public and military). More nurses in the public hospital were dissatisfied, had high burnout and intended to leave their jobs. The practice environment and patient-to-nurse ratios have important effects on job dissatisfaction and burnout, which in turn influence nurses' intention to leave. Most individual factors have no impact on nurse job outcomes, whereas organisational factors do.

9 | RELEVANCE TO CLINICAL PRACTICE

The study model shows that some modifiable factors in the practice environment are significant predictors of poor job outcomes. Understanding the study model helps administrators focus their efforts on improving some of the major causes for intention to leave, including practice environment aspects and patient-to-nurse ratio. The study results provide useful knowledge to nurses, administrators and policy-makers to help them understand the current situation and plan for retention strategies to ultimately improve nurse and patient outcomes.

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CONFLICT OF INTEREST

No conflict of interest has been declared by the authors.

AUTHOR CONTRIBUTIONS

Conception and design, or acquisition of data, or analysis and interpretation of data: E.T.L., A.K.L., Z.A.; drafting the manuscript or revising it critically for important intellectual content: E.T.L., A.K.L., Z.A.; final approval of the version to be published and sufficient participation in the work to take public responsibility for appropriate portions of the content: E.T.L., A.K.L., Z.A. and investigating and resolving the accuracy or integrity of any part of the work: Z.A.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

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