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THE RELATIONSHIPS BETWEEN PEDIATRIC NURSES' BURNOUT, QUALITY OF LIFE, AND THEIR PERCEIVED PATIENT ADVERSE EVENTS

Ph.D. Thesis Booklet

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Introduction

The nursing job is one of the most challenging jobs that makes the nurses emotionally exhausted and willing to quit the profession (Khatatbeh, Alhalaiqa, et al., 2021). We argue that pediatric nursing is even more demanding than general nursing for many reasons. For instance, pediatric nurses deal with children who are unaware, not understanding, and not cooperative (Khatatbeh, Pakai, et al., 2021). Furthermore, these children are ill and sometimes critically ill which makes pediatric nursing more complicated (Khatatbeh, Pakai, et al., 2021). In addition, pediatric nurses need to be caring about the parents who are worried about their children. A recent scoping review found moderate to high levels of burnout (BO) among pediatric nurses (Buckley et al., 2020).

BO is defined as "a state of physical, emotional and mental exhaustion that results from long-term involvement in work situations that are emotionally demanding" (Schaufeli & Greenglass, 2001), p.501. BO is also defined as a combination of emotional exhaustion, depersonalization, and reduced personal accomplishment (Maslach & Jackson, 1981). According to Maslach et al. (1986), BO is a syndrome of combined emotional exhaustion, depersonalization, and reduced personal accomplishment. Emotional exhaustion entails a psychological feeling of being unable to give because of depleted emotional resources (Maslach et al., 1986). In depersonalization, the staff becomes unfeeling or hard-hearted with clients (Maslach et al., 1986). The reduced personal accomplishment is to be dissatisfied about own job accomplishments (Maslach et al., 1986).

Quality of life (QOL) is defined by the world health organization (WHO) as a humans' impression about their situation in life within their environment regarding their aims, values, prospects, and worries (WHO, 1997).

Adverse events are those avoidable outcomes that result from wrong health care services, not from the disease itself (Van den Bos et al., 2011). Adverse events are common in all hospitals; they are considered an important aspect of patient safety. Only in the United States, around 440,000 people died in 2013 because of avoidable adverse events (Schwendimann et al., 2018). In 2008, the adverse events' estimated cost was approximately 17 billion dollars in the United States (Van den Bos et al., 2011).

Theoretical framework of the dissertation

Based on these concepts, a multifactorial model examining the causes and consequences of nurses' BO was built in three steps. First, the *integrated CS-CF-Empowerment model was created by* integrating two models: the compassion satisfaction-compassion fatigue (CS-CF) model (H.-J. Kim & Yom, 2014), and the empowerment model (Nursalam et al., 2018). According to the empowerment model, it is assumed that that QOL mediates the relationship between work-related variables and BO. Also, it was assumed that patient safety mediates the relationship between work-related variables and BO according to the CS-CF model. The second step was done by integrating the relationships between pediatric nurses' social support, job satisfaction, and NPPAEs were integrated into the multifactorial model. The last step was done by integrating the moderating roles of the common work-shift and the type of hospital. The moderating role of the common work-shift in the relationship between BO and the perceived health, and the moderating role of the hospital type in the relationship between QOL and intent to leave (ITL).

Purpose of the study

This study aimed to assess the relationships between pediatric nurses' BO, QOL, NPPAEs, and demographic and work-related characteristics.

Aims

- To systematically review the relationship between nurses' BO and their QOL.
- To investigate the relationships between demographic and work-related characteristics with BO, QOL, and the NPPAEs among Jordanian pediatric nurses.
- To assess the extent to which integrating the CS-CF and empowerment models can explain the relationships between pediatric nurses' BO, QOL, perceived patient safety, and work-related variables.
- To examine the relationship between pediatric nurses' BO and their perceived health, and the moderating effect of work shift on this relationship.
- To compare BO and perceived health between pediatric nurses working on day shifts and those working on night/ alternate shifts.
- To explore the relationship between pediatric nurses' QOL and their ITL, and the moderating role of hospital type in this relationship.
- To compare QOL of pediatric nurses working at university-affiliated hospitals and those working at ministry of health (MOH) hospitals.

Study 1: Nurses' burnout and quality of life: A systematic review

Introduction

Nurses' BO might increase absenteeism and affect their QOL (Aytekin et al., 2013; Wu et al., 2011). Nurses' absenteeism and low QOL might ultimately affect the patient safety and quality of nursing care provided to patients (Kelleci et al., 2011). Also, BO and its consequences might affect nurses' QOL (Aytekin et al., 2013; Azari & Rasouyar, 2016; Hatamipour et al., 2017).

Up to our knowledge, many researchers have systematically reviewed BO in pediatric, gynecology, emergency, and primary nursing (De La Fuente-Solana et al., 2019; Gómez-Urquiza et al., 2017; Monsalve Reyes et al., 2018; Pradas-Hernández et al., 2018). However, none of these systematic reviews has examined the relationship between nurses' BO and their QOL. The purpose of this systematic review is to examine the relationship between nurses' BO and their QOL based on the existing research.

Methods

PRISMA guidelines (Preferred Reporting Items for Systematic Reviews and Meta-Analyzes) were followed to perform this systematic review (Liberati et al., 2009). PRISMA illustrates how researchers can ensure the objective and complete reporting of systematic reviews and meta-analyses (Liberati et al., 2009). Five electronic databases CINAHL, PubMed, Medline, Psychology and Behavioral Sciences Collection, and Google Scholar, were selected for this systematic review. Two members of the review team searched the chosen databases in April 2021. First, the terms "nurses AND burnout AND quality of life" were used to find the MeSH terms on PubMed. The command line used in searching PubMed was (("Nurses"[Mesh]) AND "Burnout, Professional"[Mesh]) AND "Quality of Life"[Majr]. Searching restrictions included English language, scholarly journals, and last twelve years publications (2009-2021).

According to the predetermined inclusion criteria for this systematic review, we included only the cross-sectional and peer-reviewed studies measuring both nurses' BO and QOL using separate validated measures. The exclusion criteria were: (a) studies that didn't measure both BO and QOL, (b) studies that did not specify proportion or number of the nurses, (c) psychometric studies, (d) qualitative studies as they don't provide numerical measurements BO and QOL, (e) interventional studies, (f) preprints, and (g) studies with other languages.

After applying the predetermined inclusion and exclusion criteria for the search performed in April 2021, 21 studies were included in this systematic review. For the 21 included

articles, the following information was independently extracted by two researchers: a) the first author's surname, b) year of publication, c) research design, d) sampling method and size, e) BO instrument, f) QOL instrument, and g) results. If there was a disagreement about a certain article, a third member of the research team was consulted until an agreement was reached.

Results

The total number of nurses in the 21 included studies was 9859, three studies surveyed only female nurses (Azari & Rasouyar, 2016; Naz et al., 2016; Wu et al., 2011), one study compared female nurses to female doctors (Wu et al., 2011), another study compared nurses to nurse educators (Abraham & D'silva, 2013), and one study studied different healthcare providers, including nurses (Çelmeçe & Menekay, 2020). Regarding the working area of the participants, four studies surveyed mental nurses (Abdel-Aziz & Adam, 2020; Fradelos et al., 2014; Paniora et al., 2017; L. N. Zeng et al., 2020), one study surveyed only Neonatal Intensive Care Unit (NICU) nurses (Aytekin et al., 2013), one study surveyed pediatric nurses (H. Khatatbeh et al., 2020), one study surveyed emergency nurses (Ribeiro et al., 2021), and one study included nurses working at critical care units (Alotni & Elgazzar, 2020). Also, one study surveyed nurses caring for COVID-19 patients (Çelmeçe & Menekay, 2020).

The majority of the studies (n=16) found a negative correlation between nurses' BO and their QOL or professional QOL (Abdel-Aziz & Adam, 2020; Abraham & D'silva, 2013; Alotni & Elgazzar, 2020; Aytekin et al., 2013; Casida et al., 2019; Erkorkmaz et al., 2018; Fradelos et al., 2014; Hatamipour et al., 2017; Kelleci et al., 2011; H. Khatatbeh et al., 2020; Y. Kim et al., 2019; Kupcewicz & Jóźwik, 2020; Permarupan et al., 2020; Ribeiro et al., 2021; Q. Q. Wang et al., 2019; L. N. Zeng et al., 2020). For example, nurses' QOL was negatively correlated with emotional exhaustion and depersonalization, and positively with personal accomplishment (Kelleci et al., 2011).

General methodology used in the empirical studies (2-5)

A cross-sectional, correlational design was used in this study. A total of nine hospitals were selected as research sites; eight Ministry of Health (MOH) affiliated (including one specialized pediatric hospital) and one university hospital. Around 92% of the people in Jordan live in the northern and the central regions (Department of Jordanian Statistics, 2018). Therefore, seven hospitals in the northern and central regions and one hospital in the southern region were selected to represent MOH hospitals. Participants were approached while on duty.

4

An initial pool of 500 pediatric nurses were listed as potential participants. This pool reflects the approximate number of pediatric nurses who work in the target hospitals. Out of this sample, 300 who met inclusion criteria and consenting to participation were approached conveniently. Inclusion criteria included: 1) having worked for at least one year in a clinical pediatric nursing position prior to study; 2) holding at least an undergraduate nursing degree (vocational) as a minimum; 3) being on an annual or permanent job contract (part of the regular staff); 4) being employed by a university or MOH affiliated hospital; 5) Jordanian nationality. Finally, 225 out of 300 pediatric nurses participated in this study.

Because English is the official language of nursing education in Jordan, the original English versions of the instruments were used. Informed consent was obtained from each participant before participating in the study. Printed surveys were handed over to prospective participants. Surveys were voluntary and anonymous; completed items were placed in a sealed envelope and kept secure.

Measures

Demographic and work-related characteristics: The questionnaire included items about the participants' age, gender, marital status, number of children, educational level, salary perception, smoking, and BMI. Work-related characteristics included years of experience, type of hospital (university or MOH), hospital capacity, number of patients they are assigned for , unit capacity, weekly work hours, common work shift (Day, night/alternate), break time per shift, nursing care model, salary perception (enough, not enough), time available for family (enough, not enough), exposure to violence (none, verbal, emotional, physical), and ITL (yes, no). Participants were also asked about their Using a 5-point Likert item, nurses were asked about their perceived health (weak, excellent).

CBI: CBI is a validated questionnaire that was developed as a part of the Danish Project on BO, Motivation, and Job Satisfaction (Borritz, Rugulies, Villadsen, et al., 2006; Kristensen et al., 2005). CBI is composed of 19 Likert-type items that measure three dimensions of BO: Personal BO (6 items), Work-related BO (7 items), and Client-related BO (6 items) (Kristensen et al., 2005). The total score for each of these three dimensions is the average scores of its items (Kristensen et al., 2005). The higher the score, the higher the BO levels.

WHOQOL-BREF: The QOL of pediatric nurses was assessed using the WHOQOL-BREF, the short form of WHOQOL-100. It is composed of 26 Likert-type items; two items assess general QOL and 24 items assess four domains, namely: Physical Health, Psychological

Health, Social Relationships, and Environment (Skevington et al., 2004). Each domain assesses different facets of QOL (World Health Organization, 1996). According to the BREF manual, each domain is composed of a number of items that inquire a 5-point Likert-type responses such as "how much", "how satisfied", or "how good" felt during the past two weeks. Each answer gets a possible score of one to five, the higher the score, the lower the QOL except the three negatively phrased scales (3, 4, and 26) that should be reversed scores (World Health Organization, 1996).

NPPAEs. Using six-point Likert scale (never, once a month, a few times a month, once a week, a few times a week, every day), participants were asked about the frequency of the adverse events during the past month , namely: medication errors, patient falls, nosocomial infections and pressure ulcers.

Ethical Considerations

The necessary ethical approvals were obtained before data collection both from the Scientific Research Committee of the Jordanian MOH, as well as from the Ethics Committee of the university hospital. Data collection took place between December 2019 and March 2020.

Data Analysis

The data were analyzed using the SPSS software, version 20.0. In study 3, AMOS was also used together with the SPSS software (Version 23). The statistical significance level was set as $p < 0.05$. To describe the participants' demographic and work-related characteristics, means and standard deviations for the continuous variables and frequencies for the categorical variables were used.

Study 2: Relationships of Demographic and Work-Related Characteristics with Pediatric Nurses' Burnout, Quality of Life, and Perceived Patient Adverse Events

This study aimed to investigate the relationships between demographic (age, gender, marital status, number of children, education, smoking status, Body Mass Index) and work-related (salary perception, hospital bed capacity, unit bed capacity, and the weekly working hours) characteristics with BO, QOL, and NPPAEs among Jordanian pediatric nurses.

Results

The participation of 225 out of 300 pediatric nurses in this study yielded a 75% response rate. The mean age of the study participants was 33.6 (±6.5) years, the mean number of children was 2.3 (± 1.8), and the mean BMI was 25.8 (± 4.1). The average individual working hours per week was 41.9 (± 5.35). The majority of the participants were female (94.2%), married (82.7%), and bachelor's degree holders (87.6%). Most participants (72.2%) perceived their salaries as insufficient to cover their expenses.

Descriptive analysis of BO, QOL, and NPPAEs Outcome Scores: The mean of the total CBI scores was 67.36 (± 17.43), indicating high levels of BO among study participants. The highest score among the subscales was for personal BO (73.8 ± 20.9), followed by work-related BO (66.1 ±18.6) and client-related BO (62.5 ± 21.5). The overall QOL rating was 2.95 (± 0.97). The lowest scores on the four domains of the WHOQOL-BREF were the physical health (43.0 ± 14.0) and environment (44.4 ± 16.0). Nosocomial infections frequency (60.4%) was rated more commonly than other types of NPPAEs.

Differences between nurses' scores on BO, QOL, and NPPAEs based on the demographic and work-related characteristics: T-tests analyses showed higher BO scores (68.2) among females than males (53.0), and a lower rating of their overall QOL (2.92) than males (3.6). In addition, smoker nurses reported significant lower rating (2.46) of their overall QOL than non-smokers (3.01). The analysis also revealed that the nurses who perceived their salaries as insufficient were having a significant higher BO scores and lower rating of their overall QOL than their counterparts who perceived their salaries as enough. None of the differences in NPPAEs' scores were significant among pediatric nurses in this study. The results demonstrated that there were significant correlations between nurses' age and their personal BO ($r = -0.19$, $p < 0.010$) and total BO score ($r = -0.14$, $p < 0.050$). In addition, unit capacity was correlated significantly with social relations domain ($r = -0.15$, $p < 0.050$) and total BO scores ($r = 0.13$, $p < 0.050$). The results also showed that the overall rating of the QOL had a significant negative correlation with the total BO. None of the demographic and work-related characteristics were significantly correlated with the NPPAEs' scores. However, there was a significant negative correlation between overall QOL rating and total NPPAEs' scores.

Regression Analysis: Multiple regression analyses were run to find out the significant model to predict participants' overall QOL, BO, and NPPAEs. The predictors in the three models were the demographic and work-related characteristics. These variables all together significantly predicted overall QOL ($F (13, 180) = 2.97$, $p = 0.001$, $R^2_{Adjusted} = 0.12$), BO ($F (13, 180) = 3.0$, $p < 0.0001$, $R^2_{Adjusted} = 0.12$), and NPPAEs ($F (13, 180) = 1.81$, $p = 0.040$, $R^2_{Adjusted} = 0.05$).

Within the model predicting the overall QOL it was found that the significant predictors were unit capacity (β = -0.28, p <0.010) and monthly salary perception (β = -0.28, p <0.001). For the BO model it was found that the significant predictors were the age (β = -25, p <0.010), hospital capacity (β = -32, p <0.010), unit capacity (β = 0.30, p <0.010), and monthly salary perception (β = 0.19, p <0.010). Furthermore, the only NPPAEs' significant predictor was the monthly salary perception (β = 0.19, p <0.050).

Study 3: Pediatric nurses' burnout, quality of life, and perceived patient adverse events: Testing an integrated model using structural equation modelling

This study aimed to assess the extent to which integrating the CS-CF and empowerment models can explain the relationships between pediatric nurses' BO, QOL, perceived patient safety, and work-related variables.

Results

The age of the participants ranged from 23 to 55 years; the median age was 32.5 years. The majority of the sample was female nurses representing 94.2% of the participants. Regarding their marital status, 82.7% of the participants were married.

CFA

A pooled CFA was performed on different versions of the model. Initially, the construct work-related factor was identified using ten variables. These variables were the hospital type (governmental or university-affiliated), job satisfaction, ITL, usual work shift, weekly work hours, manager support, co-worker support, participation in continuous education, satisfaction with the monthly salary, and exposure to violence. This model did not meet the goodness of model fit indices set a priori, and the factor loadings of some items of the work-related construct were below 0.30. Factor loadings of the items reflective of the constructs: adverse events, QOL, and BO were acceptable (> 0.30). Thus, the model was adjusted by modifying the determinants of the work-related construct. The variables with the lowest factor loadings were removed from the model: type of hospital, usual work shift, and weekly work hours. The standardized factor loadings for these variables were 0.11, 0.08, and 0.03, respectively. After deleting these three variables, the model fit indices improved, but they were still not satisfactory. Another two variables were removed based on the same rationale followed in the previous step, namely: manager support and ITL. This model achieved the goodness of model fit indices criteria.

SEM Model

In the SEM model, two versions were also compared. The first model examined the effect of work-related construct on BO with serial mediation of QOL and adverse events. The second model examined the effect on BO through the separate mediation paths of QOL and adverse events. The goodness of model fit indices of the second model were better: CFI = 0.951, RMSEA = 0.063, and Chisq/df = 1.65. The results showed that the effect of the work-related construct on BO construct is statistically significant (β = - 0.51, p = 0.009). This effect means that one standard deviation increase in the work-related construct leads to a 0.51 reduction in BO. The impact of the work-related construct was significant on QOL but not on the adverse event. The mediators, QOL and adverse events, effects on BO were statistically significant. The R^2 value of the BO construct in the final model was 0.65. That means that 65% of BO variance is explained by the model and the presented paths.

Study 4: Does the type of hospital moderate the relationship between nurses' quality of life and intent to leave?

This study aimed to: (1) assess the relationship between pediatric nurses' QOL and ITL, (2) examine the moderating effect of hospital type on the relationship between pediatric nurses' QOL and ITL, (3) compare QOL of pediatric nurses working at ministry of health and university-affiliated hospitals, and (4) explore the determinants of pediatric nurses' ITL.

Results

The sample (n = 225) involved 158 nurses from MOH hospitals and 67 nurses from university-affiliated hospitals. The results showed that most participants are females (94.2 %) and married (82.7 %). The mean age of the participants was 33.6 years, and the mean experience was 11.1 years. Regarding their educational level, most of them hold a bachelor's degree (87.6 %). Results showed that most of the participants think they don't have enough time for their families (81.8%), and they have been exposed to at least one type of violence: verbal, emotional, or physical (74.2%). It was also found that pediatric nurses are assigned for 8.3 patients, on average.

Correlations

As the data were non-normally distributed, the Spearman correlation was used and showed some significant correlations between the studied variables. Most importantly, results demonstrated that ITL and QOL scores are significantly and negatively correlated (r = - .227, p < .01). Another significant correlation was also found between QOL scores and type of hospital (r = - .204, p < .01). Controlling the type of hospital, the correlation was also significant between ITL

and QOL (r = - .208, p = .001); however, the initial correlation changed from - .227 to - .208 showing a moderating effect of hospital type.

T-test

The *independent-samples t-test* showed that the pediatric nurses' QOL score is statistically different between University and MOH hospitals (t = 2.81, P = 0.005). In university-affiliated, the mean QOL score was 49.0 (SD = 11.6) compared to 43.2 (SD =14.9) in MOH hospitals.

The binary logistic regression

In order to find the significant variables predicting pediatric nurses' ITL, the binary logistic regression was done. Seven work-related variables were loaded into the model predicting ITL and Hosmer & Lemeshow goodness-of-fit test was: X^2 = 18.55, p = 0.017. Within the significant model predicting ITL, only two variables (the monthly salary perception and the nursing care model) were significantly predicting pediatric nurses' ITL. Exposure to violence, the time available for family, number of patients assigned for, working hours per week, and break time per shift were not significant predictors of ITL.

Study 5

The relationship between burnout and health: The moderating role of the common work-shift among pediatric nurses

This study aimed to: (1) explore the relationship between pediatric nurses' BO, perceived health, and common work shift, (2) examine the moderating effect of work shift on the relationship between pediatric nurses' BO and perceived health status, and (3) compare BO and perceived health between pediatric nurses working on day shifts and those working on night/ alternate shifts.

Results

The data analysis showed that the total number of participants is 225 pediatric nurses. The mean participants' age was 33.6 years with an average experience of 11.1 years. For 61.8% of the participants, the most common work shift was night and/or alternate shifts. Only 38.2% of the participants indicated that day shift is their common work shift.

Correlations

As the data were non-normally distributed, the Spearman correlation was used to explore the correlations between the studied variables. Most importantly, results demonstrated that nurses' BO and the perceived health status are negatively correlated ($r = - .343, p < .01$). Also, a significant correlation was found between nurses' BO scores and common work shift ($r = .157, p < .01$). Furthermore, the common work shift was also found negatively correlated with nurses' perceived health status ($r = - .226, p < .01$).

Controlling the common work shift, the correlation was also significant between BO and the perceived health status ($r = - .314, p > .001$). However, the initial correlation changed from - 0.343 to - 0.314 showing a moderating effect of the common work shift.

Mann-Whitney test

To compare the levels of BO and their perceived health status between nurses working on day shift and those working on night/alternate shift, we used the *Mann-Whitney* test. The results showed significant differences in the two variables, nurses' BO and their perceived health status.

Discussion of key findings

Our systematic review concluded that nurses are complaining of high levels of BO. The causes of high BO include the challenging work conditions and working environments such as changing shifts, low nurse-to-patient ratio, and poor teamwork and collaboration with other healthcare workers (Erkorkmaz et al., 2018). Also, we concluded that nurses' BO impacts their QOL in consistency with previous studies (Abraham & D'silva, 2013; Alotni & Elgazzar, 2020; Aytekin et al., 2013; Fradelos et al., 2014; Hatamipour et al., 2017; Kelleci et al., 2011; H. Khatatbeh et al., 2020; Kupcewicz & Jóźwik, 2020; Ribeiro et al., 2021; L. N. Zeng et al., 2020).

The High levels of BO found in this study among Jordanian pediatric nurses, as revealed by scores of the three CBI subscales 73.77, 66.05, and 62.5, are much higher than the scores in the PUMA study 36.9, 35.0, and 29.7, respectively (Kristensen et al., 2005). Regarding the Jordanian pediatric nurses QOL, the lowest scores on physical health and environmental domains. In terms of NPPAEs, Nosocomial infections were the most frequent among NPPAEs, which could be related to the low immunity of pediatric patients, the lack of Healthcare Workers (HCW) awareness of Infection Control (IC) guidelines, and the low compliance of HCW

with IC practices. Especially that most of the respondents are assigned to ICU and work with critically ill pediatric patients. Female pediatric nurses showed higher BO and lower QOL scores than males; this result was congruent with a previous study (Azizkhani et al., 2014). However, another study found no differences between female and male nurses in terms of BO (Gandi et al., 2011). So, gender differences should be further studied to identify the factors that are contributing to pediatric nurses BO. Also, higher BO and a lower QOL were found among pediatric nurses who perceived their salaries as insufficient than their counterparts. The inability to cover living expenses and the stress may explain this finding. This finding is consistent with a systematic review which concluded that nurses who perceived their salaries lower than their workloads were experiencing high levels of BO (Rezaei et al., 2018). Also, Pediatric nurses who smoke reported lower QOL than non-smokers. This result is congruent with a previous study which found nurses who smoke are having lower health-related QOL (Sarna et al., 2008). Our study revealed that the QOL scores were negatively correlated with both BO and NPPAEs. These results are congruent with the literature; it was found that BO scores were associated with patient safety (de Lima Garcia et al., 2019); also, lower QOL was associated with poorer quality of patient care (Berger et al., 2015).

According to the hypothesized CS-CF-empowerment integrated model, the work-related variables impact BO both directly and indirectly through QOL and the NPPAEs. The results of this study supported the direct association between some of the work-related variables (co-workers' support, job satisfaction, satisfaction with the monthly salary, participation in continuous education, and exposure to violence) and pediatric nurses' BO. Additionally, this study found that QOL is mediating the relationship between work-related variables and BO. Based on our hypothesized CS-CF-empowerment integrated model, it can be supposed that better work-related variables predict better QOL scores, which consequently predict lower BO scores. This model was partially supported by the results of the current study.

In our study, we found that co-workers' support, job satisfaction, and continuous education have positively contributed to the work-related construct. So, the co-workers' support, higher satisfaction scores, and more involvement in continuous education activities would positively improve nurses' QOL. On the other hand, exposure to violence and perception of salary have negatively contributed to the work-related construct. Thus, a lower perception of salary and a higher violence rate at workplace will affect QOL negatively. This finding matches the previous studies. For example, co-worker support was found to be a significant predictor of the different domains of QOL (Kowitlawkul et al., 2019).

The results of this study found a negative correlation between QOL and their ITL nursing jobs. This finding matches a previous study, which found that a better mental QOL decreases nurses' ITL (Perry et al., 2017). After controlling the type of hospital, the initial correlation changed showing a moderating effect of hospital type (university-affiliated or MOH) on the relationship between nurses' QOL and ITL. This finding matches a previous study that established a relationship between the type of health institution and nurses' ITL (Yamaguchi et al., 2016). The moderating effect of hospital type in the relationship between nurses' QOL and ITL can be explained by the different environments, strategies, and policies for each type of hospitals (Al Sabei et al., 2020). The varied strategies and policies will somehow alter the work environment (Al Sabei et al., 2020; Dos Santos et al., 2018) and affect the working QOL for all employees, including pediatric nurses. Consequently, QOL finally will affect nurses' satisfaction and ITL (Andresen et al., 2017). Also, the different management style across the different hospitals encompasses various levels of nurses' empowerment that finally affect their satisfaction and ITL (Yamaguchi et al., 2016). This study also found that pediatric nurses' QOL scores were significantly higher in university-affiliated hospitals than MOH hospitals. This finding is congruent with a previous study which found that the type of hospital and nurses' QOL are correlated (Moradi et al., 2014).

The results showed that the perceived health was negatively correlated with pediatric nurses' BO. In other words, the higher BO scores are associated with poorer health perception, which matches a previous study (S. H. Lin et al., 2014). The differences between the basic and partial correlation suggested a moderating effect for the shift type on the relationship between BO and perceived health. This finding can be explainable because nurses BO is known to affect their health (Fradelos et al., 2014; H. Khatatbeh et al., 2020; S. H. Lin et al., 2014). Also, night/ rotating shifts can exaggerate the impact of BO on nurses' perceived health (Ferri et al., 2016; Jensen et al., 2018). Additionally, our study showed that nurses' BO is significantly different in nurses working on day shifts from those working on night/alternate shifts. Nurses working on night/alternate shifts showed higher BO scores. This finding is partially supported by a previous study, which found that job satisfaction is significantly lower among nurses working on shifts (Tahghighi et al., 2019). Our study also showed a significant difference in the perceived health between nurses working on day shifts and those working on night/alternate shifts. This result is compatible with a previous study, which found that sleep difficulties, tiredness, and cardiac symptoms are more common among nurses working on night shifts (Ferri et al., 2016).

Conclusions

13

Unlike general nurses, Jordanian pediatric nurses are underrepresented in the BO and QOL studies. The results showed that had high BO and low QOL scores among pediatric nurses in Jordan. Nursing managers need to intervene and strategize to improve their staff QOL and reduce BO.

The integrated CS-CF-Empowerment model assesses several relationships between the work-related variables (work environment) and BO. As the nurses' work-related variables finally affect both BO and QOL, nursing managers should develop strategies that improve these variables. According to the CS-CF-Empowerment integrated model, the work-related variables that should be targeted are co-workers' support, job satisfaction, satisfaction with the monthly salary, participation in continuous education, and exposure to violence. The integrated CS-CF-Empowerment model is suitable to guide future research about nurses' BO. So, a better understanding of nurses' BO can be achieved, and a better remedy can be accomplished.

Our finding showed that pediatric nurses working at university-affiliated hospitals have better QOL than those working at MOH hospitals. We suggest adopting the university-affiliated hospitals' management style in governmental hospitals to improve pediatric nurses' QOL and decrease their ITL.

Our results showed that that the common work shift is negatively correlated with nurses' perceived health, and positively with nurses' BO scores. So, nurse managers are requested to critically observe and balance shift rotation, the night/ rotating shifts to day shifts ratio. Additionally, pediatric nurses working usually on night/alternate shifts need motivation and support by giving financial incentives or decreasing weekly work hours.

Limitations

There are several limitations for these studies. For example, our systematic review didn't include pediatric nurses nor the adverse events. The reason was because the unavailability of such studies which forced us to broaden the search strategy. However, this systematic review helped in finding research gaps regarding the pediatric population and the adverse events. Also, the conveniently selected sample was another limitation. This might had an impact on statistical conclusions and the generalization of the findings. Additionally, the patient adverse events were assessed based on the pediatric nurses' perspectives instead of reviewing patients' charts or hospital incident reports.

Implications

This study provides new evidence related to the significant relationship between work environment and pediatric nurses BO in Jordan. Reducing pediatric nurses' BO with should be part of health strategies focusing on patient safety as our findings showed that BO and patient adverse events are correlated. Besides BO, this study will also inform nurse leaders to intervene and strategize to improve the pediatric nurses' QOL. There possible interventions that might decrease pediatric nurses' BO and improve their QOL include encouraging the managerial support, reducing nurse-patient ratio, and increasing monthly salaries. According to our findings, the work-related variables that should be targeted are co-workers' support, job satisfaction, satisfaction with the monthly salary, participation in continuous education, and exposure to violence. In terms of research, we claim that the CS-CF-Empowerment integrated model can be used to guide future studies about nurses' BO. To improve pediatric nurses' QOL and decrease their ITL, we advise implementing the management style of university-affiliated hospitals in governmental hospitals. Doing so can improve the nurses' QOL and decrease their ITL. Also, it is advised that nurse managers reduce balance shift rotation, the night/ rotating shifts to day shifts ratio. Additionally, pediatric nurses working usually on night/alternate shifts should be motivated and supported by giving financial incentives or decreasing weekly work hours. Health-care institutions should also play a role in reducing pediatric nurses' BO.

Summary of novel findings

Study 1. The results of our systematic review showed moderate to high levels of BO across the included studies, varying levels of QOL, and negative relationships between BO and QOL.

Study 2. In this study, female pediatric nurses reported higher BO and a lower QOL than males. Also, pediatric nurses perceiving their salaries as insufficient reported higher BO and lower QOL than those perceiving their salaries as enough. The result showed that the overall QOL had a significant negative correlation with the total BO among pediatric nurses. Also, there was a significant negative correlation between overall QOL and NPPAEs' scores.

Study 3. The final SEM model examined the effect of work-related construct on BO, and the role of QOL and NPPAEs as mediators. The results showed that the effect of the work-related construct on BO construct is statistically significant. The impact of the work-related construct was significant on QOL but not on the adverse event. The mediators, QOL and adverse events, effects on BO were statistically significant. The R^2 value of the BO construct in the final model was 0.65. That means that 65% of BO variance is explained by the model and the presented paths. So, the CS-CF-Empowerment integrated model was found to be valid to assess the different paths in the relationship between work-related variables and BO.

Study 4. Our results showed a significant negative correlation between ITL and QOL. After controlling the type of hospital, the initial correlation changed from showing a moderating effect of hospital type. Our study showed that the pediatric nurses' QOL scores were significantly higher in the university-affiliated hospitals than MOH hospitals. Two variables (the monthly salary perception and the nursing care model) were significantly predicting pediatric nurses' ITL.

Study 5. Pediatric nurses' BO was negatively correlated with the perceived health status. Controlling the common work shift, the initial correlation changed showing a moderating effect of the common work shift. The BO significantly higher among pediatric nurses working on night/alternate shifts than those working on day shift. Also, the perceived health was significantly lower among pediatric nurses' working on night/alternate shifts than those working on day shifts.

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List of Publications

Full-text publications

Articles related to the thesis

Khatatbeh, H., Al-Dwaikat, T., Oláh, A., Onchonga, D., Hammoud, S., Amer, F., ... & Pakai, A. (2021). The relationships between paediatric nurses' social support, job satisfaction and patient adverse events. *Nursing Open.* 1– 8. https://doi.org/10.1002/nop2.907

Khatatbeh, H., Pakai, A., Al-Dwaikat, T., Onchonga, D., Amer, F., Prémusz, V., & Oláh, A. (2021). Nurses' burnout and quality of life: A systematic review and critical analysis of measures used. *Nursing Open.* DOI: 10.1002/nop2.936

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