

# Paediatric nurses' burnout and perceived health: The moderating effect of the common work-shift

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## Abstract

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

**Design:** A cross-sectional, correlational design was used in this study.

**Methods:** A convenient sample of 225 paediatric nurses was selected from nine hospitals in Jordan. Participants were surveyed using a self-administered questionnaire.

**Results:** The perceived health correlated negatively with paediatric nurses' burnout and their common work-shift. Also, nurses' burnout and common work-shift were significantly correlated. The common work-shift moderated the relationship between paediatric nurses' burnout and their health. To control the impact of paediatric nurses' burnout on their health, the ratio of the night-to-day shifts should be observed and balanced.

## KEYWORDS

burnout, paediatric nurse, perceived health, shift

## 1 | INTRODUCTION

Burnout is defined as a combination of emotional tiredness, depersonalization and reduced achievement (Maslach & Jackson, 1981). Because of the stressful hospital environment, nurses are among the most threatened health workers to develop burnout (Khatatbeh et al., 2021). Nurses' burnout is attracting more attention because it has many consequences; most importantly on their well-being and health (Fradelos et al., 2014). Additionally, varying work-shifts is one of the most important challenges making nurses risky to burnout (Vidotti et al., 2018). Although the literature is rich with studies

examining nurses' burnout and their health (Khatatbeh, Al-Dwaikat, Oláh, et al., 2021; Lin et al., 2014); however, no studies have yet assessed the moderating effect of work-shift on this relationship.

## 2 | BACKGROUND

Literature is rich with studies discussing the causes and consequences of nurses' burnout. For example, one study showed several factors that contribute to burnout among paediatric nurses, such as exposure to violence, co-workers support, participation in

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continuous education activities, job dissatisfaction and perceived salary (Khatatbeh, Al-Dwaikat, et al., 2021). Similarly, a Hungarian study found that varying shifts are stressful for nurses and associated with poor quality sleep (Fusz et al., 2021). Another study discussed how burnout among paediatric nurses is negatively associated with manager support (Khatatbeh, Pakai, Pusztai, et al., 2020).

Also, several studies have discussed the association between nurses' burnout and their health. For example, a study found that nurses' stress and health status are negatively correlated (Lin et al., 2014). Also, another study found that paediatric nurses with higher stress reported poorer health than other nurses (Khatatbeh, Al-Dwaikat, et al., 2021). Similarly, another study found a significant association between burnout and perceived health among nurses working at the emergency department (Ruiz-Fernández et al., 2021).

Additionally, literature is rich with studies discussing the relationship between shift work and nurses' health. For instance, a study demonstrated that a nurse's long-term illness is associated with a higher night-to-day shift ratio (Dall'Ora et al., 2020). Likewise, an Italian study found that nurses working on night shifts are more prone to sleep difficulties, tiredness and cardiac symptoms than nurses working on day shifts (Ferri et al., 2016). Also, another study found that sleep quality for nurses working on shifts is poorer than nurses not working on shifts (McDowall et al., 2017). A Danish study examined the impact of shift work on the lives of intensive care unit nurses (Jensen et al., 2018). This study found that sleep difficulties were more common among nurses working on evening shifts than other nurses (Jensen et al., 2018). Also, nausea and headache were more common among nurses working at night than those working on evening shifts (Jensen et al., 2018). Furthermore, mood swings were more common among critical care nurses working on night shifts than those working on evening shifts (Jensen et al., 2018).

The relationship between nurses' work-shift and burnout was discussed extensively in the previous studies. For example, nurses working on night shifts were found to have more mental symptoms than those working on day shifts (Ferri et al., 2016). Another study found that nurses working on the night shift, with low social support, are prone to higher levels of burnout than those working on the day shift (Vidotti et al., 2018). Additionally, another study found that nurses working on the day shifts have lower depression than nurses working on rotating shifts (Dehring et al., 2018). Also, a literature review concluded that job satisfaction is diminished with working permanently on night shifts (Dall'Ora et al., 2016). However,

an integrative review concluded that more research is needed to study the influence of shift work on nurses' psychological well-being (Tahghighi et al., 2017).

Based on previous studies (Haun & Baethge, 2020; Hulsegge et al., 2020; Khatatbeh et al., 2022; Khatatbeh, Pakai, et al., 2021; Khatatbeh, Pakai, Pusztai, et al., 2020; Khatatbeh, Pakai, Zrínyi, et al., 2020; Khatatbeh, Alhalaiqa, et al., 2021; Khatatbeh, Al-Maqableh, et al., 2021; Khatatbeh, Khasawneh, et al., 2021; Nabe-Nielsen et al., 2011), we hypothesized that paediatric nurses' burnout and their perceived health are correlated and that the common work-shift moderates this relationship (See Figure 1). Up to our knowledge, this study is the first of its type to study the moderating effect of work-shift in the relationship between nurses' burnout and their perceived health. Furthermore, paediatric nurses are understated in studies discussing how burnout affects the nursing workforce (Buckley et al., 2020). This study aimed to explore the relationships between paediatric nurses' burnout, perceived health and common work-shift; to examine the moderating effect of the common work-shift on the relationship between paediatric nurses' burnout and perceived health status and to compare burnout and perceived health between paediatric nurses working on day shifts and those working on night/alternate shifts.

### 3 | METHODS

#### 3.1 | Study design, participants and data collection

This cross-sectional and correlational study is a secondary analysis. Nine hospitals were selected to represent the northern, central and southern regions in Jordan. One of these hospitals was a University-affiliated hospital, while the rest were governmental hospitals. Then, a convenient sample of 225 paediatric nurses was selected from the selected hospitals. The inclusion criteria included working at a paediatric unit/ward, having at least 1 year of clinical experience, and holding at least a 2-year nursing diploma. No issues were confronted during the pilot study we conducted on 35 paediatric nurses. To ensure adequate statistical power, the post hoc test was used in G\*Power software (G\*Power, 2020). The Mann-Whitney test (2 groups) with 225 participants (86 and 139), significance set at 0.05 and medium effect size (0.38) provided a power of 0.85.

The printed surveys were endorsed to the head nurses of the paediatric unit/ward at the selected hospitals. The anonymous and

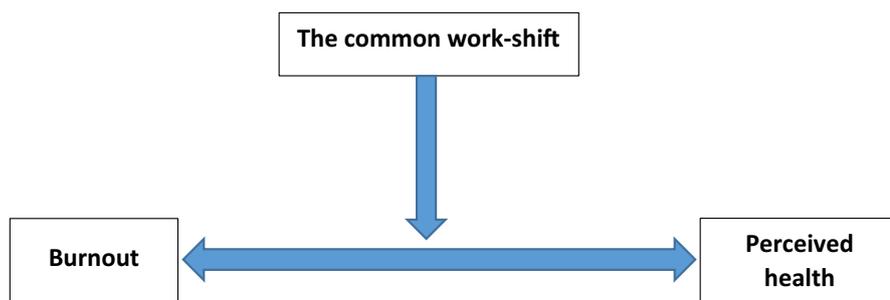


FIGURE 1 The conceptual model

voluntary participation, in addition to the right to withdraw from the study, were ensured on the cover page. Also, it was indicated on the cover page that completing this survey will take approximately 20 min. Furthermore, each participant was asked to sign a consent. The completed questionnaires were collected back 1 day later. Data collection took place in the period between December 2019 and March 2020. No prior permission was required to use the Copenhagen Burnout Inventory (CBI) because it was available in the public domain.

### 3.2 | Measures

The study measures included demographic information, including age, gender, marital status, experience, education and hospital type. Participants were also asked about their common work-shift (Day, night/alternate). Using a 5-point Likert item, nurses were asked about their perceived health (weak, excellent).

Nurses' burnout was assessed using the Copenhagen Burnout Inventory (CBI). The 19-item CBI measures three subtypes of burnout: personal, work-related and client-related burnout (Kristensen et al., 2005) (Appendix 1).

### 3.3 | Ethical considerations

Since the data were collected from two types of hospitals in Jordan, two separate ethical approvals were needed. Before the data collection started, the central institutional review boards at the Jordanian ministry of health and the university-affiliated hospital granted us the necessary permissions. The study was reported according to the Strengthening the Reporting of Observational studies in Epidemiology (STROBE) checklist (Von Elm et al., 2014) (See Appendix 2).

### 3.4 | Data analysis

The Statistical Package for the Social Sciences (SPSS) software, version 20.0, was used in data analysis, and the level of significance for statistical testing was set at 0.05. Basically, descriptive and frequency tests were used to describe the participants' characteristics (age, gender, experience, marital status, education, type of hospital, common work-shift and perceived health). Kolmogorov–Smirnov and Shapiro–Wilk tests were used to assess the data's normal distribution. The results showed that Kolmogorov–Smirnov is significant for the perceived health and common work-shift, but not for burnout. However, Shapiro–Wilk was significant for the perceived health, common work-shift and burnout. This finding in addition to the histogram shape means that these three variables are non-normally distributed (Steinskog et al., 2007). Bivariate correlation (Spearman) was used to examine the correlation between nurses' burnout, perceived health and common work-shift. To assess the moderating

effect, the common work-shift was controlled in the partial correlation test; and compared with basic correlation. Since the data are non-normally distributed, the Mann–Whitney test was used to compare the nurses working on day shifts and night/alternate shifts in terms of burnout and perceived health status.

## 4 | RESULTS

### 4.1 | Participants' demographics

The data analysis showed that the total number of participants is 225 paediatric 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 the day shift is their common work-shift (See Table 1).

### 4.2 | The relationships between burnout, perceived health and common work-shift

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' burnout and the perceived health status are negatively correlated ( $r = -0.343, p < .01$ ). Also, a significant correlation was found between nurses' burnout scores and common work-shift ( $r = 0.157, p < .01$ ). Furthermore, the common work-shift was also found negatively correlated with nurses' perceived health status ( $r = -0.226, p < .01$ ; See Table 2).

### 4.3 | The moderating effect of the common work-shift

Controlling the common work-shift, the correlation was also significant between burnout and the perceived health status ( $r = -0.314, p > .001$ ). However, the initial correlation changed from  $-0.343$  to  $-0.314$  showing a moderating effect of the common work-shift. To compare the levels of burnout and their perceived health status between nurses working on day shifts and those working on night/alternate shifts, we used the Mann–Whitney test. The results showed significant differences in the two variables, namely, nurses' burnout and their perceived health status (See Table 3).

## 5 | DISCUSSION

The first aim of this study was to explore the relationship between paediatric nurses' burnout, perceived health and common work-shift. The results showed three significant correlations between the studied variables. First, the perceived health was negatively

TABLE 1 Participants' characteristics

Variable	N	Percentage
Gender		
Male	11	4.9%
Female	212	94.2%
Missing	2	0.9%
Marital status		
Single/Divorced	39	17.3%
Married	186	82.7%
Education		
2-year college	5	2.2%
Bachelor's degree	197	87.6%
Master's degree	23	10.2%
Hospital		
MOH	158	70.2%
University-affiliated	67	29.8%
Common work-shift		
Day	86	38.2%
Night/Alternate shifts	139	61.8%
Perceived health		
Weak	48	21.3%
Fair	44	19.6%
Good	112	50.0%
Very good	19	8.5%
Excellent	1	0.4%
	<b>M</b>	<b>SD</b>
Age (years)	33.6	6.5
Experience (years)	11.1	6.74

correlated with paediatric nurses' burnout. In other words, the higher burnout scores are associated with poorer health perception, which matches a previous study (Lin et al., 2014). Second, the perceived health was negatively correlated with common work-shift. This finding means that the poorer health perception is accompanying the night/alternate shifts, which matches previous studies (Ferri et al., 2016; Jensen et al., 2018). Our finding is also congruent with a previous study which found that a nurse's illness is associated with a higher night-to-day shift ratio (Dall'Ora et al., 2020). Last, nurses' burnout was positively correlated with their common work-shift. In other words, the higher burnout scores are linked with night/alternate shifts, which is supported in previous studies (Dehring et al., 2018; Ferri et al., 2016). Our result is also consistent with a previous literature review which concluded that job satisfaction is diminished with permanent night shifts (Dall'Ora et al., 2016).

The second aim of this study was to examine the moderating effect of shift type on the relationship between paediatric nurses' burnout and perceived health. The differences between basic and partial correlation suggest a moderating effect for the shift type on the relationship between burnout and perceived health. This

TABLE 2 Bivariate correlation (Spearman)

	Burnout	The perceived health status	The common work-shift
Burnout	1.000		
The perceived health status	-0.343*	1.000	
The common work-shift	0.157*	-0.226*	1.000

\* $p < .01$ .

TABLE 3 The Mann-Whitney test

	Mean rank (Day shift)	Mean rank (Night or Alternate shifts)	Z-score
Burnout score	99.5	120.5	-2.4*
The perceived health status	129.8	101.9	-3.4**

\* $p < .05$ ; \*\* $p < .01$ .

finding can be explained in two steps. First, nurses' burnout is known to affect their health which matches the previous studies (Fradelos et al., 2014; Khatatbeh, Pakai, Pusztai, et al., 2020; Lin et al., 2014). Second is the effect of night/rotating shifts on nurses' perceived health. This result is also compatible with earlier studies (Ferri et al., 2016; Jensen et al., 2018). In other words, night/rotating shifts can exaggerate the impact of burnout on paediatric nurses' perceived health.

The last aim was to compare burnout and perceived health between paediatric nurses working on day shifts and those working on night/alternate shifts. Results showed that nurses' burnout is significantly different in nurses working on day shifts from those working on night/alternate shifts. Nurses working on night/alternate shifts showed higher burnout scores than those working on day shifts. 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). Results also showed a significant difference in nurses' perceived health between nurses working on day shifts and those working on night/alternate shifts. In other words, nurses working on night/alternate shifts have poorer health than those working on day shifts. This result is well matched 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).

## 5.1 | Limitations

The methodology of this study has some limitations, including the convenient sample, cross-sectional design. Additionally, nurses' health and common work-shift were assessed by asking about perceptions. Our results would be strengthened if we have used a validated questionnaire in assessing nurses' health, and if we have accessed nurses' work schedules.

## 6 | CONCLUSION

The results showed that paediatric nurses' burnout is negatively correlated with their perceived health. It was found that the common work-shift is negatively correlated with nurses' perceived health, and positively with nurses' burnout scores. Also, the common work-shift, day or night/alternate shifts, moderates the correlation between nurses' burnout and their perceived health. Furthermore, paediatric nurses working usually on the day shift have shown lower burnout and better health than those working at night/alternate shifts. The exaggerated burnout and poor health could finally lead to critical consequences, such as poor nursing services and nursing shortage.

It is impossible to assign all nurses on day shifts to reduce their burnout. However, we advise nurse managers to critically observe and balance shift rotation, the night/rotating shifts to day shifts ratio. Additionally, health policymakers should motivate and support paediatric nurses working usually on night/alternate shifts. Those nurses might be motivated through financial incentives or decreased weekly work hours. This could enhance nurses' health and lower burnout scores.

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### CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

### AUTHOR CONTRIBUTIONS

All authors are responsible for the reported research and have approved the manuscript as submitted. Haitham Khatatbeh: Conceptualization, Data collection, Data curation, Data analysis and Writing - Original draft preparation; Sahar Hammoud & Moawiah Khatatbeh: Data curation, Data analysis and Writing-Revising and Editing; Annamária Pakai and András Oláh: Conceptualization, Writing - reviewing and editing and Supervision.

### ETHICAL APPROVAL

Ethical approval was obtained before research implementation both from the Scientific Research Committee of the Jordanian Ministry of Health (reg. # 21,114) as well as from the Ethics Committee of King Abdullah University Hospital (reg. # 13-3-17).

### DATA AVAILABILITY STATEMENT

The data set used in this research is available from the corresponding author upon a reasonable request.

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## APPENDIX 1

## COPENHAGEN BURNOUT INVENTORY

	Always	Often	Sometimes	Seldom	Never/almost never
<b>Personal Burnout</b>					
1. How often do you feel tired?	<input type="checkbox"/>				
2. How often are you physically exhausted?	<input type="checkbox"/>				
3. How often are you emotionally exhausted?	<input type="checkbox"/>				
4. How often do you think: "I can't take it anymore"?	<input type="checkbox"/>				
5. How often do you feel worn out?	<input type="checkbox"/>				
6. How often do you feel weak and susceptible to illness?	<input type="checkbox"/>				
	Always	Often	Sometimes	Seldom	Never/almost never
<b>Work-related Burnout</b>					
1. Do you feel worn out at the end of the working day?	<input type="checkbox"/>				
2. Are you exhausted in the morning at the thought of another day at work?	<input type="checkbox"/>				
3. Do you feel that every working hour is tiring for you?	<input type="checkbox"/>				
4. Do you have enough energy for family and friends during leisure time?	<input type="checkbox"/>				
	To a very high degree	To a high degree	Somewhat	To a low degree	To a very low degree
5. Is your work emotionally exhausting?	<input type="checkbox"/>				
6. Does your work frustrate you?	<input type="checkbox"/>				
7. Do you feel burnout because of your work?	<input type="checkbox"/>				
Client-related Burnout	To a very high degree	To a high degree	Somewhat	To a low degree	To a very low degree
1. Do you find it hard to work with clients?	<input type="checkbox"/>				
2. Does it drain your energy to work with clients?	<input type="checkbox"/>				
3. Do you find it frustrating to work with clients?	<input type="checkbox"/>				
4. Do you feel that you give more than you get back when you work with clients?	<input type="checkbox"/>				
	Always	Often	Sometimes	Seldom	Never/almost never
5. Are you tired of working with clients?	<input type="checkbox"/>				
6. Do you sometimes wonder how long you will be able to continue working with clients?	<input type="checkbox"/>				

## APPENDIX 2

## STROBE STATEMENT—CHECKLIST OF ITEMS THAT SHOULD BE INCLUDED IN REPORTS OF CROSS-SECTIONAL STUDIES

	Item No	Recommendation	Page
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	1
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	1
<b>Introduction</b>			
Background/ rationale	2	Explain the scientific background and rationale for the investigation being reported	2–3
Objectives	3	State specific objectives, including any prespecified hypotheses	3
<b>Methods</b>			
Study design	4	Present key elements of study design early in the paper	3
Setting	5	Describe the setting, locations and relevant dates, including periods of recruitment, exposure, follow-up and data collection	3,4
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants	3
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders and effect modifiers. Give diagnostic criteria, if applicable	4
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	4
Bias	9	Describe any efforts to address potential sources of bias	N/A
Study size	10	Explain how the study size was arrived at	4
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	5
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	5
		(b) Describe any methods used to examine subgroups and interactions	N/A
		(c) Explain how missing data were addressed	N/A
		(d) If applicable, describe analytical methods taking account of sampling strategy	N/A
		(e) Describe any sensitivity analyses	N/A
<b>Results</b>			
Participants	13*	(a) Report numbers of individuals at each stage of study – e.g. numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up and analysed	5,6
		(b) Give reasons for non-participation at each stage	N/A
		(c) Consider use of a flow diagram	N/A
Descriptive data	14*	(a) Give characteristics of study participants (e.g. demographic, clinical, social) and information on exposures and potential confounders	5,6
		(b) Indicate number of participants with missing data for each variable of interest	N/A
Outcome data	15*	Report numbers of outcome events or summary measures	6
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (e.g. 95% confidence interval). Make clear which confounders were adjusted for and why they were included	6,7
		(b) Report category boundaries when continuous variables were categorized	N/A
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A
Other analyses	17	Report other analyses done – e.g. analyses of subgroups and interactions, and sensitivity analyses	N/A
<b>Discussion</b>			
Key results	18	Summarize key results with reference to study objectives	7,8

	Item No	Recommendation	Page
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	9
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies and other relevant evidence	8,9
Generalizability	21	Discuss the generalizability (external validity) of the study results	9
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	Title page

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at [www.strobe-statement.org](http://www.strobe-statement.org).

\*Give information separately for exposed and unexposed groups.