Journal of Pediatric Nursing 65 (2022) 69–74

Contents lists available at ScienceDirect

Journal of Pediatric Nursing

journal homepage: www.pediatricnursing.org

Evaluating workload and manpower planning among pediatric emergency department nurses in Turkey during COVID-19: A cross-sectional, multicenter study

Ayla Kaya, RN, Ph.D, Research Assistant [a], Ayşegül İşler Dalgıç, RN, Ph.D, Professor [a,*]

[a] Pediatric Nursing Department, Faculty of Nursing, Akdeniz University, Antalya, Turkey

ARTICLE INFO

Article history:
Received 15 January 2022
Revised 21 March 2022
Accepted 28 March 2022

Keywords:
COVID-19 pandemic
Emergency department
Manpower
Pediatric nursing
Workload

ABSTRACT

Purpose: Quality nursing care in pediatric emergency departments (PEDs) can be achieved only through sustained workload-based manpower planning. The purpose of this paper to evaluate perceptions of workload and manpower planning in the PED setting in Turkey from the nurses' point of view.

Design and methods: This cross-sectional, multicenter study that was conducted among 187 nurses working in a PED setting in Turkey between June and September 2021. Data were collected using a questionnaire that measured nurses' perceptions of workload and manpower planning. The reporting of this study adhered to STROBE guidelines.

Results: The majority of the respondents perceived the number of patients-per-nurse during a shift to be too high, the number of nurses to be insufficient in proportion to the workload, and the nursing manpower-planning to be insufficient and biased. Those with ≤1 year of nursing experience in the PED perceived an increased workload and more burnout during the COVID-19 pandemic period.

Conclusions: Nurses working in PED setting perceived the workload and manpower planning to be inadequate. In addition, nurses who were less experienced or felt burnout perceived their workload to be increased during the COVID-19 pandemic.

Practice implications: Further exploration of workload and manpower planning in PEDs is required. Quantifying nurses' perspectives of workload and manpower when managing emergency pediatric patients is essential for designing appropriate interventions to improve the working environment. Future studies should focus on comparing nurses' perceptions with actual workloads and manpower planning in PEDs using appropriate measurement tools.

Introduction

Overcrowding in emergency rooms is an important problem that remains to be solved (Cai et al., 2020); the fact that nurses who feel inadequate can experience burnout due to excessive workload and decreased well-being makes this issue even more challenging (Waddill-Goad, 2019). During the global coronavirus (COVID-19) pandemic, emergency services worldwide have been struggling to keep up with the increase in the number of patients admitted for care (Iordache et al., 2020; Ma et al., 2021; Moghadam et al., 2021). Emergency nurses bear a substantial workload (Clopton & Hyrkäs, 2020) and, they have extensive and intense duties, exposing to extremely high workloads, both physically and mentally (Moghadam et al., 2021). A workload is defined as a general task performed by an individual or a team over a period (Pourteimour et al., 2021), and unfortunately, with the increase in the number of patients under care, the responsibility of nurses has become greater, which inevitably increases the workload (Coventry et al., 2015). Ensuring an adequate and safe nursing workforce in emergency departments is a worldwide concern (Iordache et al., 2020). In this context, it is crucial to protect the existing nursing workforce and to optimize manpower planning. According to a report published by the World Health Organization (WHO) the world will face a shortage of 12.9 million healthcare workers in 2035. The WHO report predicted that if the shortage of healthcare workers is not addressed now, there will be serious impacts, such as a lack of access to healthcare for billions of people around the world, and disruptions in the care and treatment of chronic diseases (WHO, 2013). The inadequate number of nurses, which constitute the largest and most important majority of the health workforce, is an important problem all over

* Corresponding author at: Pediatric Nursing Department, Faculty of Nursing, Akdeniz University, Dumlupinar Boulevard, 07058 Antalya, Turkey.
E-mail addresses: aylakaya@akdeniz.edu.tr (A. Kaya), aisler@akdeniz.edu.tr (A. İşler Dalgıç).

https://doi.org/10.1016/j.pedn.2022.03.014
0882-5963/

the world (Tuna & Kahraman, 2020). Burnout of emergency nurses is the main factor affecting their intention to leave, and this situation causes a significant workforce problem in emergency services (Lee et al., 2021). Conducting field-specific studies of workload and manpower planning can help provide solutions for this problem.

In manpower planning, it is important to condut a workload analysis according to the patient classification specific to each unit (Tuna & Kahraman, 2020). Nurses in pediatric emergency departments (PEDs) have extensive and intense duties, exposing them to extremely high workloads, both physically and mentally (Moghadam et al., 2021). Visits to the PED account for roughly 20% of all consultations (Bankole et al., 2011), and the number of patients who attend the PED daily is increasing rapidly from year-to-year (Ma et al., 2021). There has been a greater workload in PEDs during the COVID-19 pandemic (Iordache et al., 2020; Ma et al., 2021; Nasirizad Moghadam et al., 2021; Pourteimour et al., 2021). Nurses are an integral part of the emergency-care workforce providing safe and effective care for children (Aitkenhead & Lee, 2019; Janhunen et al., 2021), and nurse manpower is one of the most important human resources in the ever-growing health sector (Janhunen et al., 2017; Moghadam et al., 2021). Nursing workload is also clearly related to patient safety and quality of care (Janhunen et al., 2017; Swiger et al., 2016). One of the key factors in providing high-quality care to pediatric patients is human resources (Janhunen et al., 2017; Nasirizad Moghadam et al., 2021). Quality care and valid and reliable patient/nurse ratios can be achieved only with the regular use of workload-based nurse-manpower planning (Demirgoz Bal, 2015). For these reasons, workload and manpower planning are issues that remain to be addressed in PED.

Previous studies have focused on nursing workload, particularly physical workload, and manpower planning (Ortaç Ersoy et al., 2017; Özkan & Uydacı, 2020; Wundavalli et al., 2019). It is important to analyze these factors according to the patient classifications that are specific to each unit (Tuna & Kahraman, 2020). Knowledge of both the perceived workload and the actual physical workload can guide resource planning. There is a significant relationship between physical and mental workload among nurses (Nasirizad Moghadam et al., 2021); given the challenges associated with the recruitment and retention of PED nurses, it is important to understand perceived workload burden (Lebet et al., 2021). In addition, determining the workload perceived by nurses, regardless of the physical workload, should guide planning by nurse managers. As far as we know, there have been no studies of nurses' perceptions of workload and manpower planning. The current study was carried out in the PED setting, where the workload of nurses increased considerably during the COVID-19 pandemic process. The need to respond to the demands of both pediatric patients and their families increases the intensity even more in PED (Moghadam et al., 2021). It focused on the importance of the nurses' perceived workload and their actual physical workload. There are three main types of perceived workload; performance-based, subjective and physiological. This study was based on NASA-Task Load Index, which is one of the most reliable subjective methods (Emeç & Akkaya, 2018). Knowledge of this subject is important for quality care for children and planning remedial actions in PEDs, where the number of patients is increasing rapidly. We therefore evaluated nurses' perceptions of workload and manpower planning in PEDs in Turkey.

Methods

Study design

This cross-sectional, multicenter study analyzed online survey data. To promote transparent and comprehensive reporting of this quantitative study, we followed the recommendations of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist (Von Elm et al., 2014).

Participants and setting

Data were collected from 187 nurses working in PEDs in Turkey. In most Turkish hospitals, adult and pediatric emergency care is provided within the same department but in separate rooms. In order to ensure homogeneity in the current research, data were collected only from hospitals with a separate PED that served only pediatric patients. There were approximately 600 pediatric emergency nurses working in departments that met this criterion in Turkey. A questionnaire was sent to all nurses working in PEDs in Turkey, and no regional distinctions were made within the country—in other words, participants were recruited from all over the country. Overall, data were collected from 52 PEDs, both private and public hospitals. All nurses working in these PEDs who volunteered to participate were included in the study group, with no exclusion criterion. No minimum years of experience were determined for participation in the study. Researchers sent the online questionnaire to 600 nurses and the response rate was 31.2%.

Data collection

Research data were collected between 21st June and 5th September 2021. The target group of the study was all nurses working in PEDs in Turkey. This country has a very large surface area, consisting of 81 provinces in seven regions. Therefore, it was not possible to collect questionnaires through face-to-face interviews from all hospitals, and they were sent to the nurses electronically: the data-collection forms prepared by the researchers were transferred to the online environment with the Google Forms application and the link was sent to the nurses via WhatsApp. The requirement for voluntary consent was indicated on the first page of the online survey. Those nurses who agreed to participate in the questionnaire started to answer the questions only after confirming that they were volunteering electronically. Moreover, the 'required' button was activated for each question in the online survey, so questionnaires with any missing answers could not be submitted. Once participants had provided all the required data, the answers were sent to us automatically. We could not access any missing data and all of the data submitted by the participants were analyzed. A second email reminder was sent 1 week after the first email, and a final third email reminder was sent 1 week after the second. There was no time limit for completing the survey, and completing the questionnaire took approximately 3 min for the participants. As a result, 187 questionnaires obtained from 52 PEDs were included in the analysis.

Data-collection tools

Individual identification form

In order to determine the demographics (four questions), work-related characteristics of the nurses (four questions), and their burnout feelings the COVID-19 pandemic process (one question), a nine-question individual identity form was developed by the researchers.

Assessment survey of nurses' perceptions of workload and manpower planning

The survey was developed by the researchers in line with the literature to evaluate the nurses' perceptions of workload and manpower planning while working in the PED (Ma et al., 2021; Nasirizad Moghadam et al., 2021; Sim et al., 2021). In addition, the survey, which was developed for nurses working in the PED, was developed on the basis of the NASA-Task Load Index (Hart & Steveland, 1988). The survey instrument was a standard questionnaire written in Turkish and developed by taking into account the opinions of three experts in the field. Suggestions were received from the experts regarding the intelligibility and necessity of the survey items and the number of words.

The questionnaire comprised 10 items considered two main factors: workload and manpower planning. The first factor included five items to measure nurses' perceptions of workload. This domain was assessed

using a five-point Likert s, in which 5 = strongly agree and 1 = strongly disagree with the suggested definition, respectively (Cronbach's alpha = 0.65). The items were averaged to create a scale score. A score above the average for workload (that is, >2.5) indicated that the participants perceived the workload substantially: the higher the score, the greater the perceived workload. The second factor included five items to measure nurses' perceptions of manpower planning. This domain was assessed using a five-point Likert scale, in which 5 = strongly agree and 1 = strongly disagree with the suggested definition, respectively (Cronbach's alpha = 0.63). The average score was calculated for this factor and the higher the average score, the better the participants perceived the manpower planning to be. The number and percentage of nurses who responded "I agree" to the items in the factor were calculated.

Data analysis

In this study, 187 questionnaires were analyzed and in case of missing data, the send button was not active, so questionnaires containing missing data did not reach us. Thus, all submitted questionnaires were analyzed. Statistical analyses of the data were performed using the IBM SPSS Statistics version 23.0. The reliability of the scale was tested using Cronbach's alpha coefficient. The sociodemographic characteristics and workload and manpower data were expressed as numbers, percentages, and test means. Mean value comparisons were undertaken using the independent sample *t*-test, one-way analysis of variance (ANOVA), and Tukey's post-hoc test. The normality of distribution was evaluated by the Kolmogorov–Smirnov test, and parametric tests were used as the numerical variables were normally distributed. The statistical significance value was taken as $p < 0.05$.

Ethical considerations

Ethics committee approval was obtained for the study. The Declaration of Helsinki ("World Medical Association Declaration of Helsinki,", 2013) was abided by throughout the research, and willingness and voluntariness principles were followed for the nurses to participate in the research. The survey link was sent to the nurses as a message to their mobile phones and their written consent was obtained by clicking the "I agree to complete the questionnaire" statement in the message. Thus, the principle of informed consent was fulfilled as an ethical principle.

Results

Demographics and work-related characteristics of the nurses

The mean age of the respondents was 30.69 ± 7.45 years (range = 21–50). It was determined that 62.0% ($n = 116$) of the nurses participating in the study were ≤ 30 years old, and 87.2% ($n = 163$) were female. Of the participants, 54.5% ($n = 102$) were single, and 74.4% ($n = 139$) had a baccalaureate degree. The mean duration of professional experience in the PED was 5.70 ± 5.98 years (range = 1–25). Of the participants, 90.4% ($n = 169$) were staff nurses, and 42.8% ($n = 80$) worked on rotation. In addition, 88.8% ($n = 166$) of the nurses stated that they felt burnout during the COVID-19 pandemic (Table 1).

Table 1
Demographics and work-related characteristics of the nurses.

Variables	n	%
Age (years)		
≤ 30	116	62.0
31–40	42	22.5
≥ 41	29	15.5
Gender		
Female	163	87.2
Male	24	12.8
Marital status		
Married	85	45.5
Single	102	54.5
Education		
Vocational college	24	12.8
Baccalaureate degree	139	74.4
Master's degree/PhD	24	12.8
Nursing experience in the pediatric emergency department (years)		
≤ 1	26	13.9
2–6	60	32.1
7–10	42	22.5
11–15	32	17.1
≥ 16	27	14.4
Nursing position		
In-charge nurse	18	9.6
Staff nurse	169	90.4
Region		
Aegean	45	24.1
Central Anatolia	39	20.9
Marmara	29	15.5
Mediterranean	26	13.9
Other three regions	48	25.6
Shift pattern		
Day shift	32	17.1
Night shift	75	40.1
Rotating	80	42.8
Feeling burnout during COVID-19 pandemic		
Yes	166	88.8
No	21	11.2

Perceptions of workload and manpower planning average scores

The mean scores of the participants were 3.66 ± 0.74 for workload and 2.74 ± 0.76 for manpower planning (Fig. 1).

Nurses' perceptions of workload and manpower planning

The answers of the nurses regarding questions about workload were gathered under five statements (Table 2). Of the nurses working in the PED, who participated in the study, 67.9% ($n = 127$) stated that there were too many patients-per-nurse in one shift, and 73.3% ($n = 137$) stated that the total number of nurses was inadequate compared to the workload of the department. Moreover, 54.0% of the nurses ($n = 101$) emphasized that the time they could allocate to caring for a patient was insufficient, and 46.5% ($n = 87$) could not allocate enough time for communication with the child and their family. At the same time, 70.6% of the nurses ($n = 132$) stated that their workload was much higher during the COVID-19 pandemic than in the past. There were five statements regarding nurses' workload planning (Table 2). Overall, 84.0% ($n = 157$) of the participants emphasized that nurse manpower planning was insufficient according to the number of

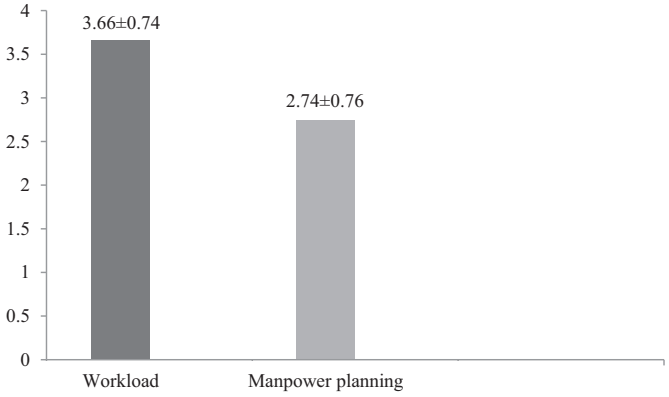

Fig. 1. Perceptions of workload and manpower planning average scores.

Table 2
Nurses' perceptions of workload and manpower planning.

Statements	n	%
Workload		
In the pediatric emergency department where I work;		
Too many patients-per-nurse in one shift	127	67.9
The total number of nurses was inadequate compared to the workload of the department	137	73.3
I could not allocate enough time to caring for a patient	101	54.0
I could not allocate enough time for communication with the child and their family	87	46.5
My workload has been much higher during the COVID-19 pandemic than in the past	132	70.6
Manpower planning		
In the pediatric emergency department where I work;		
Nurse manpower planning was insufficient according to the number of patients	157	84.0
The distribution of nurse manpower was biased	139	74.3
The job description was not appropriate	102	54.5
The supervision and feedback from managers were inadequate	122	65.2
The nurses working in the department were not experienced enough in their field	111	59.4

patients and 74.3% ($n = 139$) emphasized that the distribution of nurse manpower was biased, 54.5% ($n = 102$) stated that the job description was not appropriate, and 65.2% ($n = 122$) stated that the supervision and feedback from managers were inadequate. In addition, 59.4% ($n = 111$) stated that the nurses working in the department were not experienced enough in their field.

Factors related to nurses' perceptions of workload and manpower planning

The manpower and workload averages, which were significant according to the descriptive statistics of the participant nurses, are shown in Table 3. Nurses who had ≤1 year work experience in the PED perceived the workload to be greater and the manpower planning to be less effective than the other participants. At the same time, the nurses, who stated that they felt burnout perceived the workload to be higher and the manpower planning to be lower than the others during the COVID-19 pandemic.

Discussion

This study evaluated nurses' perceptions of workload and manpower planning in PEDs in Turkey. We believe this to be the first study to evaluate how the COVID-19 pandemic has affected PED nurses' perception of workload and manpower planning. There have been some previous reports on physical workload and manpower planning (Moghadam et al., 2021; Nasirizad Moghadam et al., 2021; Ortaç Ersoy et al., 2017; Özkan & Uydacı, 2020; Wundavalli et al., 2019). The current study focused on the perceived workload and manpower planning. The majority of participants reported that the number of patients-per-nurse during a shift was too high, the number of nurses was inadequate for the workload, and the manpower planning was insufficient and biased. Nurses with ≤1 year PED experience perceived greater increases in workload and burnout during the COVID-19 pandemic.

Table 3
Factors related to nurses' perceptions of workload and manpower planning.

	Workload	Manpower planning
Variables	$\overline{x}\pm SD$	$\overline{x}\pm SD$
Nursing experience in the pediatric emergency department (years)		
≤ 1	4.01 ± 0.58	2.45 ± 0.74
2–6	3.64 ± 0.65	2.72 ± 0.83
7–10	3.75 ± 0.70	2.78 ± 0.75
11–15	3.36 ± 0.93	3.05 ± 0.63
≥ 16	3.61 ± 0.77	2.64 ± 0.66
F/p	3.097/**0.02***	2.550/**0.04***
Feeling burnout during COVID-19 pandemic		
Yes	3.74 ± 0.70	2.66 ± 0.75
No	3.06 ± 0.78	3.34 ± 0.47
t/p	4.137/**0.01***	−4.023/**0.00***

* Remains statistically significant, $\overline{x}$ = Mean, *SD* = Standard Deviation.

In the current study, the participating nurses stated that the number of patients per nurse during a shift was high and the number of nurses was inadequate according to the workload. Hoogendoorn et al. (2021) proved that the number of patients per nurse was related to the quality of care and the outcomes of critically ill patients (Hoogendoorn et al., 2021). To ensure the quality of patient care and patient safety, the number of patients cared for by each nurse, the level of care needed, and the patient–nurse ratio should all be taken into account during planning (Bozkurt et al., 2017). The majority of the participants emphasized that they felt the manpower planning to be inadequate and biased. In the 2016 report 'Global Strategy on Human Resources for Health: Workforce 2030', the WHO emphasized a shortage in the availability of the healthcare workforce, especially in low- and lower-middle-income countries. The report also highlighted the importance of an equitable distribution of current staff to meet the needs of their clinical responsibilities (Ramgopal et al., 2018). Issues related to institution management, such as workload, overtime, absenteeism, and the balanced distribution of nurses within the institution, should be taken into account in human-resources planning, and nurse managers should take an active role in this process (Özkan & Uydacı, 2020).

According to our findings, nurses who had ≤1 year of work experience in the PED perceived the workload to be greater and there to be less manpower planning than other participants. Many nurses may not feel empowered to take an active role in the care of pediatric patients (Sim et al., 2021). Janhunen et al. (2017) emphasized in their study that nurses with <1 year of work experience found it difficult to reliably assess the quality of care for children (Janhunen et al., 2017). Emergency-room nursing can often be stressful. In addition, the care and treatment of children in PEDs is more difficult than the care of adults (Janhunen et al., 2017; Lebet et al., 2021; Manguy et al., 2018). The rapid increase in the number of patients year-on-year is increasing the workload in PEDs (Ma et al., 2021; Mowbray et al., 2020). There may be difficulties in recruiting and retaining pediatric emergency nurses (Lebet et al., 2021). All these factors should be taken into account by nurse managers and hospital management, and necessary planning should be undertaken. PEDs are the first point of medical contact for acutely ill or injured children and, therefore, appropriate resources and skilled personnel should be available to optimize their care (Sim et al., 2021). The quality of pediatric patient care is seriously evaluated in hospital EDs (Alessandrini et al., 2011) and is closely related to the competencies of nurses (Janhunen et al., 2021; Moghadam et al., 2021). In this study, nurses, who stated that they felt burnout perceived the workload to be higher and the manpower planning to be lower than the others during the COVID-19 pandemic. Studies have shown that increased nursing workload can cause burnout and thus reduce nurses' well-being as a result of job dissatisfaction (Kaya & İşler Dalgiç, 2021; Vandenbroeck et al., 2017; Waddill-Goad, 2019). In this situation, emotional support is needed throughout the process of gaining experience so that new pediatric emergency nurses do not experience burnout. In line with our findings, inexperienced nurses who start working in PEDs should be given greater support by nurse managers with similar practices, such as through orientation programs, so that they do not experience burnout. Since inexperienced nurses perceive the workload to be greater, rotation among intensive care units and other clinics is recommended for newly graduated nurses to gain proficiency before working in the PED. In this way, they can perceive a lower workload and burnout can be prevented. Resolving such crisis situations is important for the health of both employees and patients receiving healthcare services. Nursing leaders must promote a healthy care environment with an effective nursing workforce and resource planning to support

pediatric emergency nurses. Hospital management also has important responsibilities in solving these problems. Health authorities should establish regional and national multidisciplinary psychological support units for inexperienced nurses who are adversely affected by the pandemic.

Implications for pediatric nursing practice

The results of this study demonstrated that the workload and manpower planning for nurses working in the PED were not sufficient, and that those with less work experience perceived the workload to be greater and felt more burnout during the COVID-19 pandemic period. These findings can be used by nursing and hospital managers to estimate the requirements necessary to enable the best patient care in PEDs. These results reveal the need for remedial actions related to planning. EDs are exceptionally busy working areas, even during normal periods, and this has become a global crisis during the COVID-19 pandemic. Our study provides important data on nurses' perceptions about workload and manpower planning in PEDs. The findings of this study may be useful for planning remedial actions by nurses and hospital administrators. Nurse workload analysis should be performed in PEDs and the opinions of nurses working in the department be taken into account during this process to improve the quality of care in PEDs. Considering the findings of this study, an orientation program can be an effective intervention in the process of gaining experience for nurses with <1 year of work experience in the PED.

Strengths and limitations

One of the strengths of this study was that it used an easy-to-understand survey and all measurements were based on these data. In addition, no regional distinction was made in Turkey in the study and nurses from all regions were included. As a result, the findings could be generalized, although variation among PEDs in different countries must be considered. In addition, this study draws attention to the need for nursing workload analysis in PEDs in hospitals and emphasizes the importance on obtaining the opinions of nurses working in the department and including them in this process.

Despite these strengths, there were some limitations to our study that should be considered while interpreting our findings. First, the number of nurses working in the PEDs was low. Second, the study population included only a small number of male participants. Third, this was a descriptive study and there was a lack of a valid and reliable scale to measure nurses' perceptions of workload and manpower planning. Fourth, the response rate for the survey was not high and for practical reasons it had to be delivered online rather than face-to-face. Fifth, the absence of studies in the international literature investigating the perception of workload and manpower planning in PEDs did not allow us to fully compare the results.

Conclusion

The majority of the participants stated that the number of patients-per-nurse during a shift was too high, the number of nurses was inadequate based on the workload, and nurse manpower planning was insufficient and biased. Nurses with ≤1 year of work experience in the PED perceived an increased workload and greater burnout during the COVID-19 pandemic. The workload and manpower planning were perceived to be inadequate, particularly among less-experienced nurses. Quantifying nurses' perspectives of workload and manpower when managing emergency pediatric patients is essential for designing interventions to ease their working day. The results provide preliminary findings for further exploration of workload and manpower planning in PEDs. Future studies should compare nurses' perceptions with their actual workloads using appropriate measurement tools. In addition, based on the results of the study, qualitative studies are recommended to obtain in-depth information on the subject. Being supported and an orientation program organized by nurse managers can be an effective intervention in the process of gaining experience for inexperienced nurses in the PED.

Conflict of interest

No conflict of interest was declared by the authors.

Ethical approval

In order to conduct this study, ethics committee approval was obtained from Akdeniz University Ethics Committee (Date of approval: 09.06.2021, Approval number: KAEK-397). This study was performed according to the Helsinki Declaration.

Funding sources

None.

Author contributions

Design of the study: AK, AID.
Acquisition of data: AK, AID.
Analysis and interpretation of data: AK, AID.
Manuscript writing: AK.
Study supervision: AK, AID.
Critical revisions for important intellectual content: AK, AID.
All authors approved the final version for submission.

Acknowledgments

The authors would like to acknowledge all participants in this study.

References

Aitkenhead, A., & Lee, G. A. (2019). The accuracy of paediatric limb radiograph interpretation by nurse practitioners in a single Centre. *International Emergency Nursing*, *45*, 36–42. https://doi.org/10.1016/j.ienj.2019.03.001.

Alessandrini, E., Varadarajan, K., Alpern, E. R., Gorelick, M. H., Shaw, K., Ruddy, R. M., & Chamberlain, J. M. (2011). Emergency department quality: An analysis of existing pediatric measures. *Academic Emergency Medicine*, *18*(5), 519–526. https://doi.org/10.1111/j.1553-2712.2011.01057.x.

Bankole, S., Asuncion, A., Ross, S., Aghai, Z., Nollah, L., Echols, H., & Da-Silva, S. (2011). First responder performance in pediatric trauma: A comparison with an adult cohort. *Pediatric Critical Care Medicine*, *12*(4), 166–170. https://doi.org/10.1097/PCC.0b013e3181f36f6e.

Bozkurt, G., Türkmen, E., & Zengin, N. (2017). Work load related to independent function of intensive care nurses. *Journal of Intensive Care Nursing*, *21*(2), 36–41.

Cai, X., Wu, J., Chen, J., Sun, J., & Li, P. (2020). The "two-step four-level+" pediatric triage method in a medical center in southern China. *Journal for Specialists in Pediatric Nursing*, *25*(4), 1–9. https://doi.org/10.1111/jspn.12305.

Clopton, E. L., & Hyrkäs, E. K. (2020). Modeling emergency department nursing workload in real time: An exploratory study. *International Emergency Nursing*, *48*(January 2019), 100793. https://doi.org/10.1016/j.ienj.2019.100793.

Coventry, T. H., Maslin-Prothero, S. E., & Smith, G. (2015). Organizational impact of nurse supply and workload on nurses continuing professional development opportunities: An integrative review. *Journal of Advanced Nursing*, *71*(12), 2715–2727. https://doi.org/10.1111/jan.12724.

Demirgoz Bal, M. (2015). Nursing workforce planning approaches in hospital. *Journal of Health and Nursing Management*, *1*(3), 148–154. https://doi.org/10.5222/shyd.2014.148.

Emeç, Ş., & Akkaya, G. (2018). Evaluation of mental work on the health sector and an applicatıon. *Ergonomics*, *1*(3), 156–162.

Hart, S. G., & Steveland, L. E. (1988). *Development of NASA-TLX (task load index): Results of empirical and theoretical research. In & N. M. In P. A. Hancook (Ed.), Human Mental Workload.* North Holland Press.

Hoogendoorn, M. E., Brinkman, S., Spijkstra, J. J., Bosman, R. J., Margadant, C. C., Haringman, J., & de Keizer, N. F. (2021). The objective nursing workload and perceived nursing workload in intensive care units: Analysis of association. *International Journal of Nursing Studies*, *114*, Article 103852. https://doi.org/10.1016/j.ijnurstu.2020.103852.

Iordache, S., Elseviers, M., De Cock, R., & Van Rompaey, B. (2020). Development and validation of an assessment tool for nursing workload in emergency departments. *Journal of Clinical Nursing*, *29*(5–6), 794–809. https://doi.org/10.1111/jocn.15106.

Janhunen, K., Kankkunen, P., & Kvist, T. (2017). Nursing Staff's perceptions of quality of care for children in emergency departments—High respect, low resources. *Journal of Pediatric Nursing, 37*, e10–e15. https://doi.org/10.1016/j.pedn.2017.08.029.

Janhunen, K., Kankkunen, P., & Kvist, T. (2021). Pediatric emergency care: Associations between process factors and outcomes – Children's and parents' views combined with register data. *International Emergency Nursing*, *54*(April 2019), 1–5. https://doi.org/10.1016/j.ienj.2020.100937.

Kaya, A., & İşler Dalgiç, A. (2021). Examination of job satisfaction and burnout status of pediatric nurses: A cross-sectional and correlational study using online survey research in Turkey. *Perspectives in Psychiatric Care*, *57*(2), 800–808. https://doi.org/10.1111/ppc.12617.

Lebet, B. R. M., Hasbani, N. R., Sisko, M. T., Agus, M. S. D., Nadkarni, V. M., Wypij, D., & Curley, M. A. Q. (2021). Nurses' perceptions of workload burden in pediatric critical care. *Pediatric Critical Care*, *30*(1), 27–35.

Lee, M. M. D., Gensimore, M. M., Maduro, R. S., Morgan, M. K., & Zimbro, K. S. (2021). The impact of burnout on emergency nurses' intent to leave: A cross-sectional survey. *Journal of Emergency Nursing, 47*(6), 892–901. https://doi.org/10.1016/j.jen.2021.07.004.

Ma, X., Liu, Y., Du, M., Ojo, O., Huang, L., Feng, X., Gao, Q., & Wang, X. (2021). The accuracy of the pediatric assessment triangle in assessing triage of critically ill patients in emergency pediatric department. *International Emergency Nursing*, *58*, Article 101041. https://doi.org/10.1016/j.ienj.2021.101041.

Manguy, A. M., Joubert, L., Oakley, E., & Gordon, R. (2018). Psychosocial care models for families of critically ill children in pediatric emergency department settings: A scoping review. *Journal of Pediatric Nursing*, *38*, 46–52. https://doi.org/10.1016/j.pedn.2017.10.014.

Moghadam, K. N., Chehrzad, M. M., Masouleh, S. R., Mardani, A., Maleki, M., Akhlaghi, E., & Harding, C. (2021). Nursing workload in intensive care units and the influence of patient and nurse characteristics. *Nursing in Critical Care*, *26*, 425–431. https://doi.org/10.1111/nicc.12548.

Mowbray, F. I., DeLaroche, A. M., Parker, S. J., Jones, A., & Ravichandran, Y. (2020). Examining the clinical management of asthma exacerbations by nurse practitioners in a pediatric emergency department. *International Emergency Nursing*, *50*(July 2019), 100844. https://doi.org/10.1016/j.ienj.2020.100844.

Nasirizad Moghadam, K., Chehrzad, M. M., Reza Masouleh, S., Maleki, M., Mardani, A., Atharyan, S., & Harding, C. (2021). Nursing physical workload and mental workload in intensive care units: Are they related? *Nursing Open*, *8*(4), 1625–1633. https://doi.org/10.1002/nop2.785.

Ortaç Ersoy, E., Abdülkerim, Ş., Öz, A., Aslan, G., Bozkurt Kavak, P., Fakılı, D., & Topeli, A. (2017). Evaluation of nursing workload in intesive care unit. *Journal of Medical and Surgical Intensive Care Medicine*, *8*(1), 1–5. https://doi.org/10.5152/dcbybd.2017.1353.

Özkan, Ş., & Uydacı, M. (2020). Determining nurse workforce requirement based on workload in the public hospitals. *Journal of Health and Nursing Management*, *3*(7), 339–351. https://doi.org/10.5222/shyd.2020.52244.

Pourteimour, S., Yaghmaei, S., & Babamohamadi, H. (2021). The relationship between mental workload and job performance among Iranian nurses providing care to COVID-19 patients: A cross-sectional study. *Journal of Nursing Management*, *29*(6), 1723–1732. https://doi.org/10.1111/jonm.13305.

Ramgopal, S., Elmer, J., Escajeda, J., & Martin-Gill, C. (2018). Differences in prehospital patient assessments for pediatric versus adult patients. *Journal of Pediatrics*, *199*, 200–205. https://doi.org/10.1016/j.jpeds.2018.03.069.

Sim, R., Cockrell, H., Best, A. M., & Baghdassarian, A. (2021). Pediatric emergency medical care in Yerevan, Armenia: A knowledge and attitudes survey of out-of-hospital emergency nurses. *International Emergency Nursing*, *56*(March), Article 100998. https://doi.org/10.1016/j.ienj.2021.100998.

Swiger, P. A., Vance, D. E., & Patrician, P. A. (2016). Nursing workload in the acute-care setting: A concept analysis of nursing workload. *Nursing Outlook*, *64*(3), 244–254. https://doi.org/10.1016/j.outlook.2016.01.003.

Tuna, R., & Kahraman, B. (2020). Nursing manpower planning in a surgical unit. *International Journal of Caring Sciences*, *13*(3), 2180–2190. https://search.proquest.com/scholarly-journals/nursing-manpower-planning-surgical-unit/docview/2480343879/se-2?accountid=25704.

Vandenbroeck, S., Van Gerven, E., De Witte, H., Vanhaecht, K., & Godderis, L. (2017). Burnout in Belgian physicians and nurses. *Occupational Medicine*, *67*(7), 546–554. https://doi.org/10.1093/occmed/kqx126.

Von Elm, E., Altman, D. G., Egger, M., Pocock, S. J., Gøtzsche, P. C., & Vandenbroucke, J. P. (2014). The strengthening the reporting of observational studies in epidemiology (STROBE) statement: Guidelines for reporting observational studies. *International Journal of Surgery*, *12*(12), 1495–1499. https://doi.org/10.1016/j.ijsu.2014.07.013.

Waddill-Goad, S. M. (2019). Stress, fatigue, and burnout in nursing. *Journal of Radiology Nursing*, *38*(1), 44–46. https://doi.org/10.1016/j.jradnu.2018.10.005.

WHO (2013). Global health workforceshortage to reach 12.9 million in coming decades. https://apps.who.int/mediacentre/news/releases/2013/health-workforce-shortage/en/index.html.

World Medical Association Declaration of Helsinki (2013). *The Journal of the American College of Dentists*, *81*(3), 14–18. https://doi.org/10.1093/acprof:oso/9780199241323.003.0025.

Wundavalli, L. T., Kumar, P., & Dutta, S. (2019). Workload indicators of staffing need as a tool to determine nurse staffing for a high volume academic emergency department: An observational study. *International Emergency Nursing*, *46*, Article 100780. https://doi.org/10.1016/j.ienj.2019.06.003.