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Stress levels and influencing factors in pediatric nursing

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ABSTRACT

Aims: Nurses are in frontline interaction with patients/healthy individuals and their relatives and other healthcare team members due to their professional roles. The impact of the pediatric patient has been emphasized as the most stressful factor among nurses, and critical events have been shown to increase stress significantly. In our study, we aimed to determine the stress factors, coping styles, and burnout levels of pediatric nurses working in different departments in Balıkesir Atatürk City Hospital, which is a tertiary hospital located in Balıkesir province and where referral acceptance and patient density are high.

Methods: Between November 2024 and December 2024, the questionnaire was distributed face-to-face to volunteer participants after informing them about the survey. No sample selection was made in the study. The questionnaire was distributed to 110 people due to employees who were on leave on the dates of the study and who stated that they did not want to participate in the study. The statistics were realized with the data obtained from 96 people who completed the questionnaire properly. An introductory form including demographic data, the Maslach Burnout Inventory (MBI), and the Perceived Stress Scale (PSS) questionnaire was applied.

Results: 90.6% of the participants were female. The mean age was 33.2±8.7 years. 56% declared that they were married as their marital status. Of the volunteers included in the study, 47.9% had no children. The mean MB-emotional, MB-desensitization and MB-personal failure subgroups of the MBI were 21.7±7.4, 11.6±6.25 and 25.9±6.9, respectively. PSS was evaluated as 44.3±3.6. When the sub-dimensions of the MBI were examined, no significant results were found according to age and gender, and the results shown lead to the conclusion that there is burnout in nurses. While there was no difference between the number of children and burnout in the MB-Emotional Scale, MB-desensitization was found to be significantly higher in those who did not have children ($p<0.05$). MB-personal failure was not found to be significant between having children. Again, there was no statistical difference between the subgroups of the scales and marital status ($p>0.05$).

Conclusion: When the department where the nurses worked and the scales were compared, it was found that the nurses working in the neonatal intensive care unit were statistically significant in terms of emotional burnout, while the desensitization subscale did not differ between the departments, and the nurses working in the pediatric emergency department were statistically significant in terms of personal failure. No significant difference was found between the departments in terms of the PSS. Nurses working in pediatric departments, especially in neonatal intensive care and pediatric emergency departments, are more at risk for emotional burnout and personal failure. It is thought that taking necessary precautions in the early period of burnout may contribute positively to individuals.

Keywords: Stress level, nurse, pediatric

INTRODUCTION

Emergency departments are units established to meet the needs of patients, especially in life-threatening situations, and where necessary services are provided. The main aim of the emergency department team is to provide safe, adequate, and rapid care services. Critical patient care, and rapid and effective assessment lead to increased stress levels in nurses working in the emergency department. Stress factor is considered to be one of the main causes of turnover, especially in the field of nursing, and plays a very important role in 50% of turnover, as well as causing decreased performance, absenteeism, and unrest in the work environment.[1]

The patient's health status and proximity to death are patient-centered factors that affect the stress level in nurses the most. In this sense, cardiovascular, gynecologic, and pediatric emergencies are the most challenging situations, and musculoskeletal trauma, respiratory distress, and cardiac problems stand out among the events involving children.[2] Stress level is also associated with a decrease in the number of patients. Identification with the patient, lack of experience, reactions from family members, and the knowledge that the situation may worsen at any time increase the risk. In the literature, the impact of the pediatric patient was emphasized

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as the most stressful factor among nurses, and it was revealed that critical events increased stress significantly.[3-7]

Burnout rates of the repair conducted among healthcare professionals in intensive care units were found to be between 40-70%.[8] In one study, the working ward with the highest stress load was the emergency department. The nature and working environment of different departments may affect the pressure and organizational support of nursing staff.[9] In terms of sudden public health emergencies, emergency medical personnel working at the frontline of hospitals face higher occupational exposure risks, excessive workloads and severe psychological effects.

Pediatric nurses are more susceptible to workplace stress and mental health problems than nurses working in other services due to reasons such as working style and environment, family expectations, and social concerns related to the treatment of pediatric patients.[10] Studies have shown that the stress experienced by nurses is related to their length of service.[11] However, very few articles have investigated stress factors among pediatric nurses with different lengths of service. In our study, we aimed to determine the stress factors, coping styles, and burnout levels of pediatric nurses working in different departments at Balıkesir Atatürk City Hospital, a tertiary hospital located in Balıkesir province with high referral acceptance and patient density. We aimed to investigate the stress level and problems encountered by asking the Perceived Stress Scale (PSS) and Maslak Burnout Scale (MBS) questions to pediatric nurses working in different units.

METHODS

The study was carried out with the permission of Balıkesir Atatürk City Hospital Scientific Researches Ethics Committee (Date: 28.11.2024, Decision No: 2024/11/63). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki.

The population of the study consisted of nurses working in various units of the Department of Pediatrics at Balıkesir Atatürk City Hospital. A total of 172 nurses work in the Department of Pediatrics at Balıkesir Atatürk City Hospital, of which 74 nurses work in Neonatal Intensive Care, 30 nurses work in Pediatric Intensive Care, 10 nurses work in Pediatrics Service, 39 nurses work in Pediatric Emergency Service, 14 nurses work in the baby room, and 5 nurses work in outpatient clinics. In this hospital, the management and supervision of nursing services are carried out by the hospital chief nurse. Nurses work in two shifts, 08:00-16:00 and 16:00-08:00. In the emergency department, the working system is 16:00-08:00 hours on weekdays and 24 hours on weekends. Approximately 3 nurses are working in all wards during the day shift and 1 or 2 nurses are working on shifts, depending on the ward. The criteria for participation in the study were 1) being a nurse working in any of the pediatric health and diseases units, 2) Agree to participate in the study 3) Working in the same unit for at least 1 month.

The data collection tool was distributed face-to-face between November 2024 and December 2024 after informing the volunteer participants about the questionnaire. The questionnaires were distributed to participants individually, with instructions to complete them on their own and submit them personally within a few days. No sample selection was made in the study. The questionnaire was distributed to 110 people due to employees who were on leave on the dates of the study and who stated that they did not want to participate in the study. Statistics were realized with the data obtained from 96 respondents who completed the questionnaire properly.

The participants were asked a questionnaire consisting of an introductory form and scales including age, gender, marital status, race, number of children, educational status, unit of employment, and how long they have been working in the same unit.

Maslach Burnout Inventory (MBI): It was developed by Maslach and Jackson,[12] and its validity and reliability study in Turkiye was conducted by Olcay[13] and Ergin.[14] This scale consists of 22 Likert-type questions. For each item, one of five options (never, very rarely, sometimes, most of the time, or always) should be selected and answered. In addition, the scale has three dimensions; emotional burnout (EB, 9 items), desensitization (D, 5 items) and personal failure (PF, 8 items). For each sub-dimension, the scores of emotional burnouts (1, 2, 3, 6, 8, 13, 14, 16, 20), desensitization (5, 10, 11, 15, 22) and personal failure (4, 7, 9, 12, 17, 18, 19) items are summed.

When evaluating the MBI, the minimum score that can be obtained from the emotional burnout dimension is 8, and the maximum score is 40. While the minimum score in the desensitization dimension is 6, the maximum score is 30. In the dimension of decreased sense of personal accomplishment, the minimum score is 8, and the maximum score is 40. High scores in emotional burnout and desensitization and low scores in decreased sense of personal accomplishment are accepted as indicators of burnout.

Emotional burnout is used to express the excessive stress and emotional overload of individuals in business life. Desensitization deals with the relationship of burnout with other people. Employees who experience desensitization experience a number of physical and mental problems, such as extreme fatigue, restlessness, irritability, and depression. After a while, the person in this situation passes to the last stage and experiences a decrease in personal success.

The PSS was developed by Cohen et al.[15] consisting of a total of 14 items, the PSS was developed to measure how stressful the events in an individual's life are perceived to be. Participants rate each question between 0 and 4 points. It is evaluated on a 5-point Likert-Type Scale ranging from "never (0)," almost never (1), occasionally (2), often (3), and very often (4)." The 7 items with positive statements are reverse scored. The scores of the PSS-14 vary between 0 and 56, with an increase in score indicating an increase in stress. Reliability and validity analyses were performed, and it was found that the scale was positively correlated with individual life events and depression and negatively correlated with personal satisfaction and perceived social support scores.[16]

The Turkish adaptation of the PSS was carried out by Eskin et al.[16] The results of the adaptation study confirmed that the scale maintains its validity and reliability in Turkish samples,

with acceptable internal consistency coefficients (Cronbach's alpha values) and factor structures similar to the original version.

In the evaluation of these inventory scores; emotional burnout; 10-16 points range (low burnout), 17-26 points range (normal burnout), 27 points and above (high burnout). Desensitization was determined as the 0-6-point range (low burnout), the 7-12-point range (normal burnout), and 13 points and above (high burnout). Personal failure was determined as 39 points and above (low burnout), 32-38 points (normal burnout), and 0-31 points (high burnout).[17]

Statistical Analysis

Data analysis of the data was performed with the SPSS Statistics 22 Program in a computer environment. Frequency (n), percentage (%), mean, and standard deviation were used as descriptive statistics. "Independent T test" was used for comparisons between two groups, and 'one-way analysis of variance' was used for comparisons of three or more groups.

RESULTS

90.6% of the participants were female. The mean age was 33.2 ± 8.7 years. 56% declared that they were married as their marital status. Of the volunteers included in the study, 47.9% had no children. The educational status was 40 high school graduates and 56 had bachelor's and master's degrees (Table 1).

Among the volunteers, 31 were working in neonatal intensive care, 15 in pediatric intensive care, 26 in pediatric emergency department, 4 in pediatric polyclinic and 9 in pediatric ward. The duration of employment in the same department was mostly between 1-3 years (42%). The questions "Would you prefer the health sector again?" and "Are you satisfied with your job?" were answered "no" with a high rate (Table 1).

The mean MB-emotional, MB-desensitization and MB-personal failure subgroups of MBI were 21.7±7.4, 11.6±6.25 and 25.9±6.9, respectively. The PSS was evaluated as 44.3±3.6 (Table 2).

When the sub-dimensions of the MBI were examined, no significant results were found according to age and gender, and the results shown lead to the conclusion that there is burnout in nurses. While there was no difference between the number of children and MB-emotional burnout, MB-desensitization was found to be significantly higher in those who did not have children ($p<0.05$). MB-personal failure was not found to be significant between having children. There was no statistical difference between the subgroups of the scales and marital status ($p>0.05$) (Table 3-6).

When the department where the nurses worked and the scales were compared, it was found that the nurses working in the neonatal intensive care unit were statistically significant in terms of emotional burnout, while the desensitization subscale did not differ between the departments, and the nurses working in the pediatric emergency department were statistically significant in terms of personal failure. No significant difference was found between the departments in terms of the PSS.

Table 1. Demographic characteristics of the participants

Variables		n (%)
Gender	Female	87 (90.6)
	Male	9 (9.4)
Age	18-25 years	20 (20.8)
	25-35 years	41 (42.7)
	Over 35 years	35 (36.5)
Nationality	Turkish	92 (95.8)
	Other	4 (4.2)
Marital status	Single	40 (41.7)
	Married	56 (58.3)
Number of children	No	46 (47.9)
	1 child	40 (42.7)
	≥2 children	10 (10.4)
Education status	High school	40 (41.7)
	Bachelor's degree	41 (42.7)
	Master's degree	15 (15.6)
Working duration in the same department	<6 months	13 (13.5)
	6-12 months	19 (19.8)
	1-3 years	42 (43.8)
	3-5 years	13 (13.5)
	More than 5 years	8 (8.3)
Working unit	Pediatric inpatient service	9 (9.4)
	Pediatric intensive care	15 (15.4)
	Neonatal intensive care	31 (32.3)
	Pediatric emergency service	26 (27.1)
	Child polyclinic	4 (4.2)
	Nursery	11 (11.5)
Would you prefer the healthcare sector again?	Yes	23 (23.9)
	No	62 (64.5)
	Undecided	9 (9.3)
Are you satisfied with your job?	Yes	14 (14.5)
	No	71 (73.9)
	Undecided	11 (11.4)

Table 2. Mean scores of the scales according to the answers given by the participants

Maslach burnout inventory subscales	
MB-emotional	21.7±7.4
MB-desensitization	11.6±6.25
MB-personal failure	25.9±6.9
Perceived Stress Scale	44.3±3.6

Table 3. Comparison of the subgroups of the scales and gender ($p<0.05$)

	Female	Male	p
MB-emotional	21.7±7.3	21.9±9.3	0.1
MB-desensitization	11.4±6.2	13.7±6.3	0.8
MB-personal failure	25.8±7	26.4±6.6	0.9
Perceived Stress Scale	44.3±3.6	44.2±4.4	0.4

MB: Maslach burnout

Table 4. Comparison of the subgroups of the scales and age groups (p<0.05)

	Age 18-25	Age 25-35	Over 35	p
MB-emotional	19.5±7.9	21.3±7.4	23.4±7	0.15
MB-desensitization	9±5	12.4±6.2	12.2±6.09	0.1
MB-personal failure	24.7±6.9	26.5±7.13	25.9±6.8	0.6
Perceived Stress Scale	42.3±3.4	43.1±2.8	41.2±3.9	0.2

MB: Maslach burnout

Table 5. Comparison of the subgroups of the scales with the number of children (p<0.05)

	No children	1 child	2 or more children	p
MB-emotional	20.8±8.65	22.8±6.3	21.2±5.5	0.4
MB-desensitization	9.6±6.8	13.5±5.3	13.3±4	0.01*
MB-personal failure	26.5±8	25.9±6	23±4.1	0.6
Perceived Stress Scale	41.6±4.2	42.1±3.8	41.5±3.8	0,2

MB: Maslach burnout

There is a linear relationship between MB-emotional and MB-depersonalization burnout levels of the participants, while an inverse linear relationship was found between MB-emotional and MB-personal failure. It shows that nurses who start to burn out emotionally will also cause burnout in terms of desensitization (Figure).

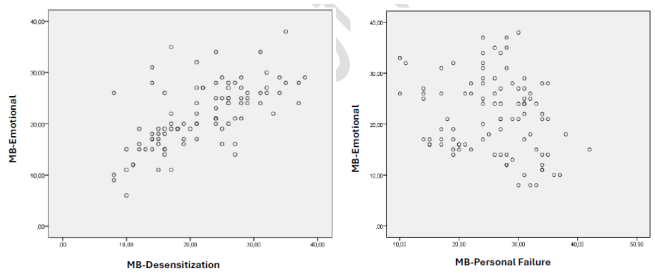

Figure. The relationship between emotional involvement of MB-depersonalization and MB-personal failure

MB: Maslach burnout

DISCUSSION

Healthcare workers experience stress and burnout due to various factors in their workplaces. Being in constant contact with people and being exposed to life-threatening situations increases this risk. The fact that nurses are in contact with highly risky pediatric patients and their parents increases this risk.

Social life and character traits of the individual are very important among the causes of burnout. Individual factors have positive and negative effects on burnout. These factors can be listed as gender, education, marital status, age, personal stress, occupational satisfaction, personal expectation, performance, motivation status, personality and personal resilience, experience, limitations, and stress. In addition, living conditions at the workplace and the relationship with coworkers are also effective.[18]

In our study, no difference was found between male and female genders in terms of burnout, whereas Balcı et al.[19] conducted a study on nurses and discovered that male gender showed more burnout. In another article, similar to our study, no difference was found between genders.[20]

Although there was no difference in terms of marital status, Maslach and Jackson[12] stated that married people can solve problems better and show better resistance to problems than single people. This may reduce the burnout level of the person. However, from another perspective, the increase in stress factors due to the increase in family responsibilities of married individuals may increase intolerance in the workplace.

Young age is one of the accepted risk factors for burnout. In our study, there was no relationship between age and sub-dimensions of burnout level (p>0.05). In a similar study conducted on intensive care nurses, no statistical difference was shown in relation to age, but a statistical difference was demonstrated in terms of the desensitization subscale in the single group.[21] In the study conducted by Karlıdağ et al.[22] with physicians, similar to our study, no significant difference was shown with marital status.

In a study conducted with nurses working in a state hospital in Denizli province, a relationship was shown between burnout level and years of experience, and an inverse relationship was shown between years of experience and burnout.[23] In our study, no statistical difference was found between years of work and experience and scale sub-dimensions. However, in a different study, it was found that working for more than 10 years was a higher risk factor among physicians.[24] This was attributed to the inability to realize their ideals with advancing years of life and being in social and economic depression.

In a study, it was found that the physical activity levels of nurses working, especially in the ward, were low. In addition, it was concluded that the quality-of-life levels of nurses were low and burnout levels were high.[25] Reduced physical activity leads to shift work, and snacking behavior leads to obesity.[26]

In studies on burnout, it is emphasized that negative conditions in the workplace are a greater factor rather than family characteristics.[27] In a burnout study conducted with nurses in a tertiary hospital in China, it was revealed that working the night shift was a bigger problem in terms of

Table 6. The relationship between the subgroups of the scales and the departments in which the nurses work

	Polyclinic	Neonatal intensive care unit	Pediatric intensive care unit	Pediatric service	Pediatric emergency service	Nursery	p
MB-emotional	23.5±4.1	24.1±6.8	24.6±7.1	21.7±6.8	17.8±8.18	19.2±5.7	0.01*
MB-desensitization	14±7.3	12.6±5.3	15.5±6.3	11.7±4.1	18.46±7	10.09±4.1	0.1
MB-personal failure	24±9.9	23.8±6.7	25.2±5.2	20±6.1	29.9±6.6	28.9±3.8	<0.01*
Perceived Stress Scale	44.5±2.08	44.3±3.7	44±3.3	45.7±4.8	44.2±3.7	43.9±3.7	0.9

MB: Maslach burnout

occupational burnout.[28] In this study, it was also stated that being younger than 30 years of age was also risky.

Night shifts and long working hours are among the main factors that negatively affect both the physical and psychological health of nurses, thereby increasing their levels of burnout.[29] Numerous studies in the literature report that nurses experience higher burnout levels due to problems associated with shift work systems. In a study conducted by Sagherian et al.,[30] it was found that nurses who constantly work night shifts have significantly higher levels of emotional exhaustion and depersonalization compared to their colleagues who work only during the day. This situation is explained by factors such as disrupted sleep patterns, chronic fatigue, changes in biological rhythm, and social isolation. Similarly, Geurts et al.[31] emphasized that long working hours and consecutive shifts in nurses restrict resting time, which undermines psychological well-being and paves the way for burnout. Additionally, Karhula et al.[32] stated that nurses working in irregular shift systems experience lower job satisfaction, which directly contributes to the development of burnout syndrome.

Nurses' difficulties in maintaining work-life balance, distancing themselves from social life, and insufficient rest lead to decreased professional motivation and negatively affect the quality of patient care. Therefore, improving working conditions is of great importance in protecting nurses from burnout.[33]

When the burnout scores of nurses based on their current clinical departments are examined, it is observed that those working in neonatal intensive care units are at higher risk in terms of emotional exhaustion, while those working in pediatric emergency units have higher scores related to personal accomplishment failure. Similar to our findings, another study reported that nurses working in intensive care units exhibited significantly higher levels of emotional exhaustion and depersonalization compared to those in other departments.[34] This can be attributed to the higher levels of responsibility and workload in intensive care and emergency units relative to other settings.

In our study, a significant and positive correlation was found between participants' emotional exhaustion (EE) and depersonalization (DP) levels. This finding supports the widely accepted model of burnout in the literature, which suggests that individuals who are emotionally exhausted tend to become indifferent and detached from the people they serve over time.[12,34,35]

However, a negative correlation was found between emotional exhaustion and personal accomplishment (PA) in our study, which contradicts the frequently reported expectation of a positive correlation in the literature.[29] This unexpected finding can be interpreted in several ways: (1) Burned-out individuals may evaluate success based on internal rather than traditional criteria; (2) the feeling of failure may be suppressed due to psychological defense mechanisms; (3) experienced individuals may maintain their sense of competence due to stronger coping skills; (4) institutional support and team solidarity may enhance the feeling of personal success.

Although there are few studies supporting this finding in the literature, some research has reported weak or non-significant relationships between emotional exhaustion and perceived personal failure.[36,37] Therefore, this unique finding in our study highlights the importance of evaluating the dimensions of burnout independently. We argue that addressing these dimensions separately can lead to more meaningful and clear conclusions.

For instance, the weak correlation between emotional exhaustion and personal accomplishment may stem from the fact that these two constructs reflect different psychological states. Emotional exhaustion is mainly related to the depletion of one's emotional energy, while the perception of personal failure is associated with an individual's inability to realize their potential and achieve personal goals. This indicates that each burnout dimension has its own specific effects that may not directly overlap with the perception of personal failure.

These unique findings suggest that independently evaluating the dimensions of burnout may help us better understand the relationship between burnout and perceived personal failure. This approach provides a broader perspective both theoretically and practically, enabling a clearer analysis of these two constructs. Due to their professional roles, nurses are in constant communication and interaction with patients, healthy individuals, their families, and other members of the healthcare team. Therefore, taking necessary measures in the early stages of burnout may provide positive contributions to individuals. Recommended solutions include improving working conditions, enhancing communication, and increasing social activities to address these contributing factors.

Limitations

The strengths of the article are as follows: Stress and burnout among pediatric nurses, especially those working in intensive care and emergency services, is a highly relevant topic. The comparison of nurses working in different pediatric units (e.g., neonatal ICU, pediatric emergency, outpatient clinic) allows for the identification of specific sources of stress. The use of validated and reliable Turkish versions of the MBI and PSS enhances the scientific validity of the measurements. Detailed analyses of participants' demographic characteristics such as age, gender, marital status, educational level, and parental status were conducted. The sample size was appropriate for the study. However, the limitations include the fact that the study was conducted in a single hospital in Balıkesir, limiting generalizability. No comparisons were made with other cities or institutions. Furthermore, due to the small number of nurses in certain groups (e.g., nursery), statistically reliable comparisons may be challenging.

CONCLUSION

As a result, burnout is prevalent in pediatric departments, which are among the most stressful areas in the healthcare sector. Nurses working in neonatal intensive care and pediatric emergency departments are at higher risk in terms of emotional exhaustion and personal failure. This study

revealed that nurses experience moderate to high levels of stress and burnout, particularly due to long working hours and night shifts. These findings underscore the need for institutional measures to regulate shift patterns and reduce workload. Providing psychological support and improving team communication can help mitigate burnout symptoms. Additionally, promoting professional development and social activities may enhance well-being. Overall, a supportive and balanced work environment is essential for sustaining nurses' mental health and quality of care.

ETHICAL DECLARATIONS

Ethics Committee Approval

The study was carried out with the permission of the Balıkesir Atatürk City Hospital Scientific Researches Ethics Committee (Date: 19.09.2024, Decision No: 2024/09/51).

Informed Consent

Signed and informed consent forms were obtained from the nurses who participated in the study.

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

The authors declared that this study has received no financial support.

Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

REFERENCES

1. Montero-Tejero DJ, Jiménez-Picón N, Gómez-Salgado J, Vidal-Tejero E, Fagundo-Rivera J. Factors influencing occupational stress perceived by emergency nurses during prehospital care: a systematic review. *Psychol Res Behav Manag*. 2024;17:501-528. doi:10.2147/PRBM.S455224
2. Khazaei A, Esmaeili M, Navab E. The most and least stressful prehospital emergencies from emergency medical technicians' view point; a cross-sectional study. *Arch Acad Emerg Med*. 2019;7(1):e20.
3. Bohström D, Carlström E, Sjöström N. Managing stress in prehospital care: strategies used by ambulance nurses. *Int Emerg Nurs*. 2017;32:28-33. doi:10.1016/j.ienj.2016.08.004
4. Gentil RC, Ramos LH, Whitaker IY. Nurses' training in prehospital care. *Rev Lat Am Enfermagem*. 2008;16(2):192-197. doi:10.1590/s0104-11692008000200004
5. Alameddine M, Kazzi A, El-Jardali F, Dimassi H, Maalouf S. Occupational violence at Lebanese emergency departments: prevalence, characteristics and associated factors. *J Occup Health*. 2011;53(6):455-464. doi:10.1539/joh.11-0102-oa
6. Soravia LM, Schwab S, Walther S, Müller T. Rescuers at risk: posttraumatic stress symptoms among police officers, fire fighters, ambulance personnel, and emergency and psychiatric nurses. *Front Psychiatry*. 2021;11:602064. doi:10.3389/fpsyt.2020.602064
7. Grochowska A, Gawron A, Bodys-Cupak I. Stress-inducing factors vs. the risk of occupational burnout in the work of nurses and paramedics. *Int J Environ Res Public Health*. 2022;19(9):5539. doi:10.3390/ijerph19095539
8. Cingi CC, Eroğlu E. Sağlık çalışanlarında merhamet yorgunluğu. *Osmangazi Tıp Derg*. 2019;41(1):58-71. doi:10.20515/otd.449810
9. Akpınar AT, Taş Y. Acil servis çalışanlarının tükenmişlik ile iş doyum düzeyleri arasındaki ilişkiyi belirlemeye yönelik bir araştırma. *Turk J Emerg Med*. 2011;11(4):161-165. doi:10.5505/1304.7361.2011.89804
10. Liao H, Tang W, Huang Y, et al. Stressors, coping styles, and anxiety & depression in pediatric nurses with different lengths of service in six tertiary hospitals in Chengdu, China. *Transl Pediatr*. 2020;9(6):827-834. doi:10.21037/tp-20-439
11. Sharma N, Takkar P, Purkayastha A, et al. Occupational stress in the Indian army oncology nursing workforce: a cross-sectional study. *Asia Pac J Oncol Nurs*. 2018;5(2):237-243. doi:10.4103/apjon.apjon_61_17
12. Maslach C, Jackson SE. The measurement of experienced burnout. *J Organ Behav*. 1981;2(2):99-113. doi:10.1002/job.4030020205
13. Olcay BY. Lighting methods in the Byzantine period and findings of glass lamps in Anatolia. *J Glass Stud*. 2001;43:77-87.
14. Ergin C. Doktor ve hemşirelerde tükenmişlik ve Maslach Tükenmişlik Ölçeği'nin uyarlanması, VII. Ulusal Psikoloji Kongresi, Hacettepe Üniversitesi, Ankara. 1992.
15. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. *J Health Soc Behav*. 1983;24(4):385-396. doi:10.2307/2136404
16. Eskin M, Harlak H, Demirkıran F, Dereboy Ç. Algılanan Stres Ölçeği'nin Türkçe'ye uyarlanması: güvenirlik ve geçerlik analizi. *New Symposium J*. 2013;51(3):132-140.
17. Helvacı I, Turhan M. Tükenmişlik düzeylerinin incelenmesi: Silifke'de görev yapan sağlık çalışanları üzerinde bir araştırma. *İşletme İktisat Çalış Derg*. 2013;1(4):58-68.
18. Çapulcuoğlu U, Gündüz B. Lise öğrencilerinde tükenmişliğin cinsiyet, sınıf düzeyi, okul türü ve algılanan akademik başarı değişkenlerine göre incelenmesi. *Trakya Üni Eğit Fakül Derg*. 2013;3(1):12-24.
19. Balcı Gök U, Turan GB, Özkan İ, Özdemir Ü. Hemşirelerde tükenmişlik ve yorgunluk semptomları. *İzmir Tepecik Eğit Hast Derg*. 2013;23(2):83-87. doi:10.5222/terh.2013.83944
20. Karabulut Gül Ş, Engin R, Canbaz Ş, Suner S. Radyasyon onkolojisi kliniği çalışanlarında depresyon ve tükenmişlik düzeylerinin sosyodemografik özelliklerle ilişkisinin değerlendirilmesi. *Turk J Oncol*. 2012;27(1):11-17.
21. Kekeç D, Tan M. Yoğun bakım ünitelerinde çalışan hemşirelerin tükenmişlik düzeyinin belirlenmesi. *Online Turk J Health Sci*. 2021;6(1):64-72. doi:10.26453/otjhs.765237
22. Ünal S, Yoloğlu S. Hekimlerde iş doyumu ve tükenmişlik düzeyi. *Türk Psikiyatri Derg*. 2000;11(1):49-57.
23. Metin Ö, Gök Özer F. Hemşirelerin tükenmişlik düzeyinin belirlenmesi. *Anad Hemşir Sağ Bil Derg*. 2007;10(1):58-66.
24. Prieto Albino L, Robles Agüero E, Salazar Martínez LM, Daniel Vega E. Burnout en médicos de atención primaria de la provincia de Cáceres. *Aten Primaria*. 2002;29(5):294-302. doi:10.1016/s0212-6567(02)70567-2
25. Aydın Y, Kamuk YU. Hemşirelerin fiziksel aktivite düzeyleri ile yaşam kalitesi ve tükenmişlik düzeyleri arasındaki ilişkinin incelenmesi. *JSSR*. 2021;6(1):88-105. doi:10.25307/jssr.902511
26. Yaman F, Yemez K, Durgan O, et al. Obezite, cerrahisi ve anestezi. Livre de Lyon; 2023.
27. Lee H, Song R, Cho YS, Lee GZ, Daly B. A comprehensive model for predicting burnout in Korean nurses. *J Adv Nurs*. 2003;44(5):534-545. doi:10.1046/j.0309-2402.2003.02837.x
28. Li L, Wang X, Zhou J, et al. Factors associated with chronotype, job burnout, and perceived stress among nurses in Chinese tertiary hospitals: a multicenter cross-sectional study. *Chronobiol Int*. 2024;41(7):1058-1067. doi:10.1080/07420528.2024.2373224
29. Maslach C, Leiter MP. Understanding the burnout experience: recent research and its implications for psychiatry. *World Psychiatry*. 2016;15(2):103-111. doi:10.1002/wps.20311
30. Sagherian K, Clinton ME, Abu-Saad Huijer H, Geiger-Brown J. Fatigue, work schedules, and perceived performance in bedside care nurses. *Workplace Health Saf*. 2017;65(7):304-312. doi:10.1177/2165079916665398
31. Geurts SAE, Beckers DGJ, Tucker P. Recovery from demanding work hours: a comparison between part-time and full-time employees. *Work Stress*. 2014;28(2):177-193. doi:10.1080/02678373.2014.909545

32. Karhula K, Härmä M, Sallinen M, et al. Association of job strain with working hours, shift-dependent perceived workload, sleepiness and recovery. *Ergonomics*. 2013;56(11):1640-1651. doi:10.1080/00140139.2013.837514

33. Costa G. The impact of shift and night work on health. *Appl Ergon*. 1996;27(1):9-16. doi:10.1016/0003-6870(95)00047-x

34. Öztürk S, Bahar A, Çelik E. Bir üniversite hastanesinde çalışan hemşirelerin tükenmişlik düzeyi ve sosyal desteğin etkisi. *Cukurova Med J*. 2014;39(4):729-740. doi:10.17826/cutf.27524

35. Schaufeli WB, Leiter MP, Maslach C. Burnout: 35 years of research and practice. *Career Dev Int*. 2009;14(3):204-220. doi:10.1108/13620430910966406

36. Taris TW, Le Blanc PM, Schaufeli WB, Schreurs PJ. Are there causal relationships between the dimensions of the Maslach burnout inventory? A review and two longitudinal tests. *Work Stress*. 2005;19(3):238-255. doi:10.1080/02678370500270453

37. Houkes I, Janssen PP, de Jonge J, Bakker AB. Personality, work characteristics, and employee well-being: a longitudinal analysis of additive and moderating effects. *J Occup Health Psychol*. 2001;6(1):29-46. doi:10.1037/1076-8998.6.1.29