



BANDIRMA ONYEDİ EYLÜL ÜNİVERSİTESİ
SAĞLIK BİLİMLERİ VE ARAŞTIRMALARI
DERGİSİ
BANU Journal of Health Science and Research

DOI: 10.46413/boneyusbad 1586736

Özgün Araştırma / Original Research

Workload and Medical Error Tendency in Nurses: A Descriptive and Correlational Study
Hemşirelerde İş Yükü ve Tıbbi Hata Eğilimi: Tanımlayıcı ve İlişki Arayıcı Bir Çalışma

Merve YILMAZ¹  Seda Tuğba BAYKARA MAT² 

¹ Mrs, Okan University,
 Faculty of Health Sciences,
 Department of Nursing,
 Istanbul,

² Assist. Prof., Istanbul
 Beykent University, Faculty of
 Health Sciences, Department
 of Nursing, Istanbul

**Sorumlu yazar / Corresponding
 author**

Seda Tuğba BAYKARA
 MAT

matsedatugba@gmail.com

**Geliş tarihi / Date of
 receipt:** 17.11.2024

**Kabul tarihi / Date of
 acceptance:** 20.07.2025

Atf / Citation: Yılmaz, M.,
 Baykara Mat, S. T. (2025).
 Workload and medical error
 tendency in nurses: A
 descriptive and correlational
 study. *BANÜ Sağlık Bilimleri ve
 Araştırmaları Dergisi*, 7(3),
 744-753. doi:
 10.46413/boneyusbad.1586736

*This study was derived from
 the master's thesis of Merve
 Yılmaz.

ABSTRACT

Aim: This study examines the effect of nurses' workload perceptions on their tendency to make medical errors.

Material and Method: Conducted in a metropolitan Istanbul hospital, the study included 215 nurses from emergency, inpatient, and outpatient units. The sample size, determined as 201 at a 95% confidence level, was exceeded. Data were collected using the Nurse Personal and Professional Information Form, Workload Scale, and Medical Error Tendency Scale, then analyzed with SPSS 25.0. Spearman Correlation Analysis was used to assess relationships between variables ($p < 0.05$).

Results: The nurses' mean age was 31.50 ± 8.10 years; 74.90% were female, and 57.20% were single. Most worked in inpatient wards (58%) and on shifts (74.90%). The mean Workload Scale score was 3.27 ± 0.66 , and the Medical Error Tendency Scale score was 4.61 ± 0.43 . No significant correlation was found between workload and medical error tendency ($p > 0.05$).

Conclusion: Despite high perceived workloads, nurses reported low tendencies toward medical errors. The lack of a significant relationship suggests other factors may influence error tendencies. Future studies should include varied settings and consider additional variables for broader insights.

Keywords: Hospitals, Malpractice, Medical mistake, Nursing, Nursing staffs, Staff Workload

ÖZET

Amaç: Bu çalışma, hemşirelerin iş yükü algılarının tıbbi hata yapma eğilimleri üzerindeki etkisini incelemeyi amaçlamaktadır.

Gereç ve Yöntem: Araştırma, İstanbul'daki bir şehir hastanesinde acil servis, yataklı servis ve polikliniklerde görev yapan 215 hemşire ile gerçekleştirilmiştir. Örneklem büyüklüğü %95 güven düzeyinde 201 olarak belirlenmiştir. Veriler Kişisel ve Mesleki Bilgiler Formu, İş Yükü Ölçeği ve Tıbbi Hata Eğilimi Ölçeği ile toplanmış; analizler SPSS 25.0 programı kullanılarak yapılmıştır. İki ölçek arasındaki ilişki Spearman Korelasyon Analizi ile değerlendirilmiş ($p < 0,05$).

Bulgular: Hemşirelerin yaş ortalaması 31.50 ± 8.10 olup %74.90'u kadın, %57.20'si bekadır. Katılımcıların %58.10'u yataklı servislerde, %74.90'ı vardiyalı sistemde çalışmaktadır. İş Yükü Ölçeği puanı 3.27 ± 0.66 , Tıbbi Hata Eğilimi Ölçeği puanı 4.61 ± 0.43 olarak bulunmuş; iş yükü ile tıbbi hata eğilimi arasında anlamlı bir ilişki saptanmamıştır ($p > 0.05$).

Sonuç: Hemşirelerin iş yükü algısı yüksek, ancak tıbbi hata eğilimleri düşük bulunmuştur. İş yükü ile tıbbi hata eğilimi arasında anlamlı bir ilişki yoktur. Gelecekteki çalışmalar, farklı hastane gruplarında daha geniş değişkenlerle yapılmalıdır.

Anahtar Kelimeler: Hemşirelik, Hemşire personel, Hastaneler, Malpraktis, Personel işyükü, Tıbbi hata



This work is licensed under a Creative Commons Attribution-Non Commercial 4.0 International License.

INTRODUCTION

The nursing profession is a dynamic and demanding field, marked by heavy workloads that can negatively impact job design and overall professional effectiveness (El Shahhat, Ahmed, & El-Shaer, 2024). Workload refers to the stress-inducing situation where an individual feels overwhelmed by tasks beyond what is expected (Cerit, Tok, & Temelli, 2022). Nurses' excessive workloads can directly affect the quality of patient care, leading to delays in treatment, reduced motivation, decreased alertness and concentration, and heightened pressure. These factors contribute to an increased likelihood of making medical errors (Albuhumud & Elizabeth, 2023; Umansky, 2015).

Errors and deficiencies in nursing care pose significant risks to patient safety, diminish quality of life, and increase healthcare costs (Babacan, Öztürk, & Kahrman, 2018). Among the most common mistakes nurses face under high workloads are medication administration and injection errors (Karimvand, Hasheminejad, Zarandi, & Jahani, 2019). Moreover, the World Health Organization (2022) reports that approximately 1 in 10 patients is harmed by healthcare services, with more than 3 million deaths occurring annually due to unsafe care. This issue is particularly prevalent in low- and middle-income countries.

Nurse workload is a complex, multidimensional concept that involves the time, skills, and care services needed to meet the demands of patient care (Khalili & Heydari, 2022). A high workload in nursing has been linked to elevated stress levels and detrimental effects on patient care (Umansky & Rantanen, 2016). Several factors contribute to workload, including nurse-patient ratios, working hours, department type, the work environment, and mental stress. Critical care units are mainly known to experience a higher workload than general units (Albuhumud & Elizabeth; Othman, El-Fattah, & Ragab, 2022).

The link between nurse workload and the propensity for medical errors represents a critical issue for the long-term viability of the nursing profession and the improvement of patient care quality. This study seeks to deeply explore how the workload of nurses affects their likelihood of committing medical errors and to offer strategic suggestions for enhancing patient safety in

healthcare settings.

The study will seek an answer to the question “Is there a relationship between workload and medical error tendency in nurses?”.

MATERIAL AND METHOD

Research Type

The research was conducted in a descriptive and correlational design.

Place of Research

The study was conducted in a tertiary city hospital in Istanbul between November 1, 2023, and January 1, 2024. This hospital features three emergency departments—adult emergency, pediatric emergency, and obstetric emergency—employing a total of 90 nurses who work in both day and rotating shifts. The inpatient wards encompass diverse specialties, including surgery, pediatrics, gynecology, hematology, orthopedics, obstetrics, oncology, neurosurgery, urology, nephrology, neurology, and plastic surgery. These wards employ 230 nurses working in both daytime and shift-based schedules. Additionally, the hospital's outpatient clinics operate with 100 nurses who work exclusively during the day.

Study Population and Sample

The study population consisted of 420 nurses working the emergency department, inpatient wards, and outpatient clinics of a tertiary city hospital in Istanbul. When the number of individuals in the population was known, the minimum sample size to be reached for a margin of error of alpha 0.05 at a 95% reliability level was calculated as 201 using the formula for calculating the sample size (Yazıcıoğlu & Erdoğan, 2014). Although it was aimed to reach all of the nurses, 33 nurses were not included in the study because they were on annual leave, 61 nurses left their departments by transfer, and 38 nurses were transferred to other departments not included in the study. As 73 nurses did not volunteer to participate in the study, the study was continued with 215 nurses. The rate of participation in the study was determined to be 74.65%.

Data Collection Tools

The study used the Professional and Personal Information Form, Workload Scale, and Medical Error Tendency Scale as data collection tools.

Occupational and Personal Information Form:

This form consists of 16 questions about the socio-demographic and professional characteristics of nurses, including gender, age, marital status, educational status, professional position, unit of employment, duration of employment in the institution, and unit, duration of professional experience, weekly working hours, working style, satisfaction with the institution, unit, and profession, and how practical the workload is on the tendency to medical malpractice (Cerit et al., 2022)

Workload Scale: Umansky This scale, developed by Duxbury and Higgins in 1994 and consisting of a total of 11 items, aims to assess the workload felt by individuals and includes dimensions such as time required to perform the work, knowledge, skills, responsibility, work intensity and personal perception (Duxbury & Higgins, 1994). It is scored using a 5-point Likert scale Cronbach's alpha coefficient of the scale was determined as .82. In the validity and reliability study conducted by Aycaan and Eskin in 2005, the Cronbach's alpha coefficient of the scale was calculated as .84 (Aycaan & Eskin, 2005). In our study, the Cronbach's Alpha coefficient of the scale was found to be .80. The Workload Perception Scale assesses individuals' perceived levels of workload. Based on the mean scores, perception levels are categorized as follows: Low (1.00 – 2.33), Moderate (2.34 – 3.66), High (3.67 – 5.00). As the score increases, the individual's perceived workload increases (Aycaan & Eskin, 2005).

Medical Error Tendency Scale: The scale was developed by Özata and Altuncan in 2010 Consisting of 49 items, the scale includes five sub-dimensions, namely "Medication and Transfusion Practices," "Prevention of Infections," "Patient Monitoring and Material-Device Safety," "Prevention of Falls," and "Communication," which measure the level of nurses' tendency to make medical errors. It is assessed using a 5-point Likert-type scale (1 = never, 2 = very rarely, 3 = occasionally, 4 = usually, 5 = always). An increase in the total score indicates that the nurse has a low tendency to make medical errors, while a decrease indicates a high tendency. In Özata and Altuncan's study, Cronbach's Alpha internal consistency coefficient of the scale was determined as .95 (Özata& Altuncan, 2010). This coefficient was found to be .97. The total score ranges from 49 to 245. The scale is designed such that higher scores indicate a lower tendency to make medical errors, while

lower scores reflect a higher tendency.

Variables of the Study: The independent variables of the study included the sociodemographic characteristics of the nurses (such as gender, age, marital status, and educational status), their position, unit of employment, duration of employment in the institution and in the unit, duration of professional experience, weekly working hours, and working style. In contrast, the dependent variables were the scores obtained from the Workload Scale and the Medical Error Tendency Scale.

Ethical Consideration

This study was conducted after obtaining ethics committee approval from the Ethics Committee for Research in Science, Social and Non-Interventional Health Sciences of a university in Istanbul (Date: 13.09.2023, and Approval number: 28). Since the research was conducted in a tertiary city hospital in Istanbul, written permission was obtained from the Provincial Health Directorate with the decision letter dated 28.11.2023 and numbered 2023/19. Written permissions were obtained from the relevant scale owners for the scales used. The data collection process was completed by obtaining verbal and written consent from the nurses participating in the study.

Data Analysis

Data were analyzed using the SPSS version 25.0 statistical software package. Descriptive statistics were presented as frequencies and percentages for categorical variables. Since the numerical variables did not meet the assumption of normal distribution, they were reported using mean, standard deviation, minimum, maximum, and median values.

The Mann–Whitney U test was used for comparisons between two independent groups, and for comparisons among more than two groups, the Kruskal–Wallis test was applied. Post hoc subgroup analyses were conducted using the Mann–Whitney U test and interpreted with Bonferroni correction. Relationships between numerical variables were assessed using Spearman's correlation analysis due to the non-parametric nature of the data. Additionally, the correlation between the two scales was examined using Spearman's correlation coefficient. A significance level of $p < 0.05$ was considered statistically significant throughout the analyses.

RESULTS

This section presents findings related to nurses' personal and professional characteristics, mean scale scores, personal and professional characteristics, mean scale scores, and correlations between the scales. When the personal and professional characteristics of the participants were examined, it was found that the mean age was 31.50 years, 74.90 % (161) were female, and 79.10 % were undergraduate graduates. Of the participants, 58.10% worked in inpatient wards, 93% were nurses, and 7% were

nurse managers. In addition, 74.90% of them worked in a shift system. The mean duration of employment in the institution was 7.31 years, the mean duration of employment in the unit was 4.43 years, the mean duration of professional experience was 8.65 years, and the mean weekly working time was 46.70 hours. Satisfaction with the institution where they worked was 55.30%, satisfaction with the unit where they worked was 66%, and satisfaction with working in the profession was 49.30%. The mean score of thinking that workload affects medical error tendency was 6.37.

Table 1. Relationship between Unit of Employment, Weekly Working Hours and Age (n=215)

		Age			Working Hours per Week					
		n	Mean	Sd	Min	Max	Mean	Sd	Min	Max
Unit you work in	Emergency Service	59	28.11	4.95	23	50	49.52	6.46	40	64
	Polyclinic	31	44.87	7.64	25	62	40.32	1.24	40	45
	Inpatient Service	125	29.82	5.87	22	52	46.90	7.61	30	72

This study examined the ages and weekly working hours of nurses working in different healthcare units. The Emergency Department has 59 nurses, with an average age of 28.11 years and a weekly working hour average of 49.52 hours. The outpatient clinic has 31 nurses, with an average age of 44.87 years and a weekly working hour average of 40.32 hours. In the inpatient unit, there are 125 nurses, with an average age of 29.82 years and a weekly working hour average of 46.90 hours (Table 1).

participants had a mean score of 3.27 on the Workload Scale, indicating a moderate level of perceived workload.

When the mean scores of the scales presented in Table 2, related to nurses' perceptions of workload and medical error tendency, were examined,

The mean score on the Medical Error Tendency Scale was 4.61, suggesting a low tendency to make medical errors. Regarding the sub-dimensions of this scale, the mean score for the Medication and Transfusion Practices subscale was 4.74; the Hospital Infections subscale had a mean of 4.64; the Patient Monitoring and Material Safety subscale had a mean of 4.41; the Falls subscale had a mean of 4.52; and the Communication subscale had a mean score of 4.48

Table 2. Descriptive Statistics for Scales and Subscales (n=215)

	Mean	Sd	Min	Max	Cronbach's Alpha
Workload Scale	3.27	± .66	1.73	4.91	.80
Medical Error Tendency Scale	4.61	± .43	2.92	5	.97
Drug and Transfusion Practices	4.74	± .38	2.39	5	.94
Hospital Infections	4.64	± .48	2.67	5	.93
Patient Monitoring and Material Safety	4.41	± .63	2.33	5	.92
Falls	4.52	± .58	1.8	5	.86
Contact	4.48	± .69	1.6	5	.89

The results in Table 3, indicate that female participants reported significantly lower mean scores on the Workload Scale compared to male participants ($Z = -2.02, p = 0.04$). When evaluated by professional position, nurses had an average score of 3.31 ± 0.66 on the Workload Scale, while nurse managers reported a lower score, reflecting

a statistically significant difference ($Z = -2.59, p = 0.01$).

Analysis of work style revealed that shift workers reported significantly higher workload scores than those on fixed schedules, with this difference being highly significant ($Z = -6.86, p < 0.00$).

When examining the units worked in, it was found that emergency department staff scored higher on the Workload Scale compared to outpatient clinic staff, indicating a very significant difference ($Z = -6.53, p < 0.00$). Additionally, scores on the Medical Error Tendency Scale also varied by unit, particularly with significant differences observed between the emergency department and outpatient clinic ($Z = -2.27, p = 0.02$) and between the outpatient clinic and inpatient unit ($Z = -7.08, p < 0.00$).

Participants expressing dissatisfaction with their institution had a significantly lower "Workload Scale" average compared to those who were satisfied, indicating that dissatisfaction negatively

impacts their perception of workload. Furthermore, the values $Z = -5.84$ and $p < 0.00$ suggest that this difference is statistically significant and highlights the substantial effect of institutional satisfaction on work processes.

The difference between participants who were dissatisfied with their department and those who were satisfied is particularly pronounced in the areas of "Drug and Transfusion Practices" and "Hospital Infections." The Z and p values for the "No/Undecided" comparison were $Z = -2.70$ and $p = 0.01$, respectively, supporting the idea that departmental satisfaction influences perceptions of healthcare practices.

Table 3. Examination of the Relationship between Scale Scores and Demographic Characteristics

	Workload Scale	Medical Error Tendency Scale	Drug and Transfusion Practices	Hospital Infections	Patient Monitoring and Material Safety	Falls	Contact
	Mean ± Sd	Mean ± Sd	Mean ± Sd	Mean ± Sd	Mean ± Sd	Mean ± Sd	Mean ± Sd
Gender							
Female	3.22 ± 0.66	226.52 ± 19.55	4.75 ± 0.37	4.65 ± 0.45	4.43 ± 0.59	4.57 ± 0.53	4.50 ± 0.67
Male	3.43 ± 0.65	223.16 ± 25.99	4.69 ± 0.43	4.60 ± 0.57	4.37 ± 0.75	4.39 ± 0.69	4.44 ± 0.77
Z/p	-2.02 / 0.04	-0.133 / 0.89	-0.29 / 0.77	-0.09 / 0.930	-0.28 / 0.780	-1.60 / 0.11	-0.03 / 0.99
Professional Position							
Nurse	3.31 ± 0.66	225.03 ± 21.84	4.73 ± 0.40	4.63 ± 0.50	4.39 ± 0.64	4.51 ± 0.59	4.46 ± 0.71
Nurse Manager	2.83 ± 0.56	234.33 ± 9.60	4.83 ± 0.16	4.79 ± 0.19	4.71 ± 0.30	4.73 ± 0.41	4.77 ± 0.30
Z/p	-2.59 / 0.01	-1.078 / 0.28	-0.21 / 0.83	-0.24 / 0.81	-1.49 / 0.14	-1.51 / 0.13	-1.16 / 0.24
How you work							
Overtime	2.75 ± .52	224.09 ± 20.44	4.79 ± .25	4.58 ± .50	4.34 ± .63	4.50 ± .58	4.27 ± .86
Shifts	3.45 ± .61	226.21 ± 21.66	4.72 ± .42	4.66 ± .48	4.44 ± .63	4.53 ± .58	4.55 ± .61
Z/p	-6.86 / < 0.001	-0.76 / 0.44	-0.51 / 0.61	-1.11 / 0.27	-1.09 / 0.27	-0.30 / 0.76	-1.95 / 0.05
Unit you work in**							
Emergency Service	3.47 ± 0.63	4.70 ± 0.38	4.80 ± 0.28	4.68 ± 0.46	4.62 ± 0.53	4.60 ± 0.62	4.67 ± 0.63
Polyclinic	2.47 ± 0.35	4.51 ± 0.48	4.81 ± 0.22	4.47 ± 0.57	4.24 ± 0.76	4.43 ± 0.61	4.08 ± 1.02
Inpatient Service	3.38 ± 0.59	4.58 ± 0.44	4.69 ± 0.45	4.67 ± 0.46	4.36 ± 0.62	4.51 ± 0.55	4.49 ± 0.58
Emergency Service/ Polyclinic Z/p	-6.53 / < 0.00	-1.51 / 0.13	-0.28 / 0.78	-1.55 / 0.12	-2.09 / 0.04	-1.11 / 0.27	-2.61 / 0.01
Emergency Service/ Inpatient Service Z/p	-0.97 / 0.33	-2.27 / 0.02	-1.70 / 0.09	-0.83 / 0.40	-3.16 / 0.00	-1.84 / 0.07	-2.80 / 0.00
Polyclinic/ Inpatient Service Z/p	-7.08 / < 0.00	-0.11 / 0.91	-1.07 / 0.28	-1.11 / 0.27	0.27 / 0.74	-0.29 / 0.77	-1.42 / 0.16

* $p < .050$, SD: Standard Deviation, Z: Mann-Whitney U Test, H: Kruskal-Wallis Test

** Bonferroni Correction $p < .017$

Table 4. Correlation Between Scale Scores and Demographic Characteristics

		Workload Scale	Medical Error Tendency Scale	Drug Transfusion Practices	Hospital Infections	Patient Monitoring Material Safety	Falls	Contact
Age	r	-0.46	0.02	0.03	-0.01	-0.00	0.00	-0.05
	p	<0.00	0.81	0.67	0.88	0.94	0.98	0.50
Period of Employment Institution	r	-.38	-0.01	0.001	-0.04	-0.01	-0.02	0.05
	p	<0.00	0.86	0.98	0.52	0.89	0.72	0.44
Period of Employment Unit	r	-0.28	-0.04	-0.02	-0.10	0.90	0.78	0.26
	p	<0.00	0.51	0.81	0.13	0.90	0.78	0.26
Period of Employment profession	r	-0.42	0.02	0.03	-0.01	0.02	-0.00	-0.03
	p	<0.00	0.74	0.61	0.87	0.80	0.94	0.65
Weekly working hours	r	0.39	-0.02	-0.11	0.001	0.03	-0.01	0.08
	p	<0.00	0.72	0.09	0.97	0.64	0.89	0.21
Period of Employment Institution	r	0.33	-0.16	-0.14	-0.06	-0.13	-0.10	-0.11
	p	<0.00	0.02	0.03	0.35	0.05	0.13	0.11

p < 0.05, r: Spearman Correlation Analysis

In terms of professional satisfaction, participants who answered "No" had a higher average compared to those who answered "Yes". This finding underscores the impact of job satisfaction on the quality of patient care. The "No/Yes" comparison yielded $Z=-4.32$ and $p<0.00$, indicating that professional satisfaction creates a significant difference in healthcare service applications.

In examining the correlations between scale scores and demographic characteristics in Table 4, a significant negative correlation was identified between age and the Workload Scale ($r = -0.46$, $p < 0.00$), suggesting that the perception of workload diminishes with age. Similarly, a negative correlation was observed between the Length of Service in the Institution and the Workload Scale ($r = -0.38$, $p < 0.00$), indicating that prolonged tenure within the institution is

associated with a decreased perception of workload. Notably, a significant positive relationship was found solely in the "Medication and Transfusion Practices" domain ($r = 0.00$, $p = 0.00$).

Moreover, a negative correlation was noted between the Length of Service in the Unit and the Workload Scale ($r = -0.28$, $p < 0.00$). A significant negative correlation also exists between the Length of Professional Experience and the Workload Scale ($r = -0.42$, $p < 0.00$), further emphasizing that as professional experience increases, individuals tend to perceive their workload as less burdensome. Positive significant relationships were detected with the subdimensions of "Medication and Transfusion Practices" and "Hospital Infections" ($r = 0.02$, $p = 0.74$; $r = 0.03$, $p = 0.61$).

Table 5. Analysis of the Relationship Between the Scale and Its Subdimensions

		Medical Error Tendency Scale				
		Workload Scale	Drug and Transfusion Practices	Hospital Infections	Patient Monitoring and Material Safety	Falls
Medical Error Tendency Scale	r	-0.10				
	p	0.14				
Drug and Transfusion Practices	r	-.09				
	p	.15				
Hospital Infections	r	-.01	.74			
	p	.89	<.00			
Patient Monitoring and Material Safety	r	-.06	.67	.73		
	p	.34	<.00	<.00		
Falls	r	-.0	.62	.69	.77	
	p	.24	<.00	<.00	<.00	
Contact	r	-.0	.58	.63	.77	.75
	p	.8	<.00	<.00	<.00	<.00

p < 0.050, r: Spearman Correlation Analysis

Additionally, a positive correlation was found between Weekly Working Hours and the Workload Scale ($r = 0.39, p < 0.00$), suggesting that longer working hours may lead to an elevated perception of workload. Lastly, a positive relationship was established between the Effect of Workload on Error Tendency and the Workload Scale ($r = 0.33, p < 0.00$), indicating that increased workload may heighten error tendencies.

No statistically significant relationship was found between the total scores of the Workload Scale and the Medical Error Tendency Scale ($p > 0.00$). However, the Workload Scale exhibited a statistically significant positive correlation with the subdimensions of the Medical Error Tendency Scale seen Table 5.

DISCUSSION

This study examines how nurses' perceptions of their workload influence their likelihood of making medical errors. The results show that nurses experience a strong sense of workload pressure. As is well known, nursing is associated with heavy workloads and a notable frequency of human errors. Excessive workload can complicate decision-making processes for nurses, potentially leading to errors. Research by Öztürk et al. (2018) highlights that nurses often engage in malpractice, particularly in medication administration (Babacan et al., 2018).

In contrast, the research conducted by Karimvand et al. (2019) found no direct correlation between high workload and an increase in human errors among nurses. However, it suggests that such workload has negative implications for nursing practice. Additionally, the research conducted by Er and Özkan (2024) indicates that the perception of workload and occupational stress among nurses in surgical clinics did not significantly influence their attitudes toward medical errors (Er & Özkan, 2024). This suggests that the relationship between workload and nurses' error-making attitudes may be complex. Such discrepancies may stem from the varying operational models and policies of the institutions involved in these studies.

The study revealed that nurses on shift work experience a heavier workload than those with fixed schedules. It is widely recognized that extended working hours can result in both physical and mental exhaustion (Zarea, Mohammadi, Beiranvand, Hassani & Baraz, 2018). Various literature findings indicate that

shift work negatively affects fatigue, mental workload, and medical errors (Bagheri Hosseinabadi et al., 2019; Eraslan & Bozkurt, 2023; Gao et al., 2017; Kiyamaz & Koç, 2018). Another study emphasizes that medical errors are associated with long working hours, staff shortages, wage inequities, poor communication, management issues, and excessive workload (Bagheri Hosseinabadi et al., 2019).

Other parameters affecting nursing care quality indicators include gender, job satisfaction, managerial support, job security, and work-life balance. This study found that while the gender, professional position, and work style of nurses are related to workload, they do not significantly influence the tendency for medical errors. Research in this area indicates that female nurses are more likely to experience higher levels of moral distress than their male counterparts, emphasizing the necessity of considering gender differences, overall workload, and biases when examining nurses' well-being and care delivery (Othman et al., 2022). Similarly, the study by Russeng et al. (2020) concluded that workload leads to emotional exhaustion, negatively impacting female nurses' performance. Emotional fatigue diminishes nurses' effectiveness in patient care, threatening the overall quality of healthcare services (Asaloei, Jim, Dien, & Werang, 2023).

The findings of this study indicate that nurses have a low tendency to commit medical errors, which is consistent with previous literature (Küçüköğlü, Karakaş & Çelebioğlu, 2016). Conversely, research by Albuhumud (2023) highlights that nurses caring for COVID-19 patients faced high workload levels, adversely affecting patient care (Albuhumud & Elizabeth, n.d.). Additionally, variations in the tendency for medical errors among nurses were observed based on the units in which they work; it was found that emergency department nurses exhibited higher tendencies for errors in areas such as patient monitoring and material safety. This phenomenon can be explained by the workload characteristics associated with the unit (Cerit et al., 2022). Additionally, the research conducted by Melnyk et al. (2021) found that nurses working in intensive care units experienced a higher rate of medical errors. In contrast, another study revealed that although nurses in intensive care units generally had a lower likelihood of making medical errors, those working with pediatric patients exhibited a higher propensity for such errors (Karadağ, Ovayolu, Parlar Kiliç, Ovayolu,

Göllüce, 2015).

The literature indicates that inconsistencies in workload due to deviations from standard procedures account for 25.6% of medication administration errors (Jin, Chen, Munechika, Sano, & Kajihara, 2018). This study reveals that the impact of workload on medication and transfusion application errors is limited. On the other hand, the high correlation observed in subdimensions such as hospital infections, patient monitoring, material safety, and falls is noteworthy; this may suggest that nurses could become less vigilant regarding patient fall incidents in situations of increased workload. Medical errors and patient safety are critical issues addressed within healthcare systems worldwide. Studies have identified various causes of medical errors, including systemic factors, a shortage of healthcare professionals, inadequate qualifications, and poor communication (Nergiz & Uğur, 2016). Nurses' high workload is mainly associated with increased patient safety incidents, especially with rising fall rates (Carlesi, Padilha, Toffoletto, Henriquez-Roldán, & Juan, 2017).

Similarly, the high correlations of the communication subdimension with other subdimensions underscore the critical role of communication in preventing medical errors. Effective communication plays a significant role in helping nurses manage their workload and reduce errors. A study highlighting medical errors, patient safety, and communication identifies the primary causes of medical errors in the operating room as insufficient healthcare personnel, inadequate equipment, and communication deficiencies (Nergiz & Uğur, 2016). Additionally, communication issues among healthcare professionals contribute to the increase in errors. Babacan et al. (2018) highlight that medical errors in nursing are common and frequently stem from factors like exhaustion, staffing challenges, and communication failures (Babacan et al., 2018).

The study concluded that the duration of experience does not significantly affect medical errors. However, some research indicates that increased experience may correlate with increased medication errors (Cerit et al., 2022; Küçükoğlu et al., 2016). On the other hand, the relationship between job satisfaction and workload is noteworthy. Nurses who are dissatisfied report significantly higher workload scores than those who are satisfied, and similarly,

the association between satisfaction and the tendency for medical errors is also significant. This suggests that job satisfaction substantially impacts nurses' workload and error tendencies. Additionally, the literature indicates that factors such as workplace bullying, professional burnout, and work-life imbalance contribute to an increased risk of medical errors (Chan et al., 2022).

Work-related stress is crucial in influencing the likelihood of medical errors in nursing practice. According to Cerit et al. (2022), nurses experiencing high-stress levels tend to have a reduced propensity for committing medical errors, emphasizing the vital role of stress management in ensuring patient safety. Similarly, research by Bay Chan et al. (2021) in Oman highlights that perceived medical errors among nurses are associated with workplace bullying, professional burnout, and challenges in maintaining work-life balance. These studies illustrate that medical errors in nursing are influenced by technical expertise and psychosocial factors.

The study determined that there is no significant correlation between nurses' workload and their likelihood of committing medical errors. These results align with prior research suggesting that medical errors are more commonly linked to nurses' psychological states, especially symptoms of depression, rather than the demands of their workload (Garrouste-Orgeas et al., 2015). These results highlight that the tendency for nurses to make medical errors cannot be solely attributed to workload, and psychological factors must also be considered. However, some studies indicate that workload can increase the propensity for medical errors (Er & Özkan, 2024; Kiymaz & Koç, 2018). These findings suggest that the responsibility for medical errors is not solely attributed to workload and that factors such as nurses' education level, work environment, occupational stress, and job satisfaction may influence this relationship (Zarea et al., 2018).

Study Limitations

The limitations of this study include its cross-sectional design, which restricts the ability to establish causality. Additionally, the research was conducted in a single institution within a defined timeframe, which may limit the generalizability of the findings. Furthermore, unmeasured variables, such as individual coping strategies and organizational characteristics, could have

influenced the observed relationship between workload and the tendency for medical errors.

CONCLUSION

This study demonstrated that increased workload among nurses is significantly associated with a higher likelihood of medical errors. Nurses who reported excessive workloads also indicated lower job satisfaction and poorer perceived communication within healthcare teams. Furthermore, findings revealed that nurses experiencing high work-related stress were more prone to making clinical mistakes. The results underline the importance of workload as a contributing factor to patient safety and the overall quality of nursing care.

To practically apply the findings, systems should be established to assist nurses in managing work-related stress. Continuous monitoring and evaluation should be improved to better understand the relationships between workload and treatment error situations. Future research should also focus on the traits of larger cohorts.

Ethics Committee Approval

Ethics committee approval was received for this study from the Istanbul Okan University Ethics Committee (Date: 13.09.2023, and Approval Number: 28).

Author Contributions

Idea/Concept: M.Y., S.T.B.M.; Design: M.Y., S.T.B.M.; Supervision/Consulting: S.T.B.M.; Analysis and/or Interpretation: M.Y., S.T.B.M.; Literature Search: M.Y., S.T.B.M.; Writing the Article: M.Y., S.T.B.M.; Critical Review: S.T.B.M.

Peer-review

Externally peer-reviewed.

Conflict of Interest

The authors have no conflict of interest to declare.

Financial Disclosure

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

REFERENCES

Albuhumud, M. S., & Elizabeth, V. (2023). The effect of workload on nurses who are taking care of COVID-19 patients. *Saudi Journal of Nursing and Health Care*, 6(7), 236–240. doi: 10.36348/sjnhc.2023.v06i07.008

Asaloei, S. I., Jim, E. L., Dien, F. H. J., & Werang, B. R. (2023). Workload, work-related stress, and emotional exhaustion in the healthcare sector.

Journal of Southwest Jiaotong University, 58(4). doi: 10.35741/jisue.v58n4.22057

Aycan, Z., & Eskin, M. (2005). Relative contributions of childcare, spousal support, and organizational support in reducing work–family conflict for men and women: The case of Turkey. *Sex Roles*, 53, 453–471. doi:10.1007/s11199-005-7134-8

Babacan, E., Öztürk, H., & Kahrıman, İ. (2018). Medical errors and patient safety: Evaluation of the effectiveness of training programs for nurses. *Journal of Performance and Quality in Health Care*, 14(2), 57–72.

Bagheri Hosseinabadi, M., Khanjani, N., Etemadinezhad, S., Samaci, S. E., Raadabadi, M., & Mostafae, M. (2019). The associations of workload, individual and organizational factors on nurses' occupational injuries. *Journal of Clinical Nursing*, 28(5–6), 902–911. doi:10.1111/jocn.14699m

Carlesi, K. C., Padilha, K. G., Toffoletto, M. C., Henriquez-Roldán, C., & Juan, M. A. C. (2017). Patient safety incidents and nursing workload. *Revista Latino-Americana de Enfermagem*, 25, e2841. doi:10.1590/1518-8345.1280.2841

Cerit, B., Tok, H. H., & Temelli, G. (2022). Relationship between work-related strain level in nurses and their medical error tendency. *Sağlık Bilimlerinde Değer*, 12(1), 130–136. doi:10.33631/sabd.1055480

Chan, M. F., Al Balushi, A. A., Al-Adawi, S., Alameddine, M., Al Saadoon, M., & Bou-Karroum, K. (2022). Workplace bullying, occupational burnout, work–life imbalance and perceived medical errors among nurses in Oman: A cluster analysis. *Journal of Nursing Management*, 30(6), 1530–1539. doi:10.1111/jonm.13432

Duxbury, L., & Higgins, C. (1994). Interference between work and family: A status report on dual-career and dual-earner mothers and fathers. *Employee Assistance Quarterly*, 9(3–4), 55–80. doi:10.1300/J022v09n03_05

El Shahhat, Z., Ahmed, M., & El-Shaer, A. (2024). Nursing workload influence on nurses job injury and patient complication. *Mansoura Nursing Journal*, 11(1), 369–382.

Eraslan, S. T., & Bozkurt, G. (2023). Examination of factors affecting the tendency of intensive care nurses towards medical errors: A multicenter study in Turkey. *Clinical and Experimental Health Sciences*, 13(4), 732–738. doi:10.33808/clinexphealthsci.1190115

Er, F., & Özkan, M. (2024). The effects of perceived organizational support on attitudes toward medical errors in surgical nurses: A cross-sectional study. *International nursing review*, 71(3), 626–634. <https://doi.org/10.1111/inr.12888>

- Gao, X., Hu, B., Suo, Y., Lu, Q., Chen, B., Hou, T... & Zong, Z. (2017). A large-scale survey on sharp injuries among hospital-based healthcare workers in China. *Scientific Reports*, 7(1), 42620.
- Garrouste-Orgeas, M., Perrin, M., Soufir, L., Vesin, A., Blot, F., Maxime, V., ... & Argaud, L. (2015). The Iatref study: medical errors are associated with symptoms of depression in ICU staff but not burnout or safety culture. *Intensive Care Medicine*, 41, 273–284. doi:10.1007/s00134-014-3601-4
- Jin, H., Chen, H., Munechika, M., Sano, M., & Kajihara, C. (2018). The effect of workload on nurses' non-observance errors in medication administration processes: A cross-sectional study. *International Journal of Nursing Practice*, 24(5), e12679. doi:10.1111/ijn.12679
- Karadağ, G., Ovayolu, Öz., Parlar Kiliç, S., Ovayolu, N., and Göllüce, A. (2015) Malpractic in nursing: The experience in Turkey. *Int J Nurs Pract*, 21: 889–895. doi: 10.1111/ijn.12263.
- Karimvand, M. N., Hasheminejad, N., Faghihi Zareandi, A., & Jahani, Y. (2019). Evaluation of workload and human errors in nurses. *Archives of Occupational Health*, 3(1), Article 346. <https://doi.org/10.18502/aoh.v3i1.346>
- Khalili H, Heydari A. (2022). Poor Care: A Walker and Avant Concept Analysis. *J Caring Sci*. 20, 12(1), 25-32. doi: 10.34172/jcs.2023.30507.
- Kiyamaz, D., & Koç, Z. (2018). Identification of factors which affect the tendency towards and attitudes of emergency unit nurses to make medical errors. *Journal of clinical nursing*, 27(5-6), 1160-1169.
- Küçüköğlü, S., Ası Karakaş, S., & Çelebioğlu, A. (2016). Hemşirelerin tıbbi hata yapma eğilimleri ve etkileyen faktörler. *Uluslararası Hakemli Hemşirelik Araştırmaları Dergisi*, 8, 88-102.
- Nergiz, B., & Uğur, E. (2016). Göğüs hastanesinde solunum yoğun bakım ünitesinde çalışan hemşirelerin iş analizi. *Yoğun Bakım Hemşireliği Dergisi*, 23(3), 140-150.
- Othman, A., Abd El-Fattah, M., & Ragab, O. H. (2022). Effect of Nursing Workload on Work Design as Perceived by Staff Nurses. *Sohag Journal of Nursing Science*, 1(1), 21-27.
- Özata, M., & Altuncan, H. (2010). Frequency of Medical Errors in Hospitals, Determination of Medical Error Types and Medical Errors: Konya Sample. *Journal of Medical Research*, 8(2), 100-111
- Öztürk, H., Kahrman, İ., & Babacan, E. (2018). Medical errors and patient safety: evaluation of the effectiveness of the trainings for nurses. *J Perform Qual Health*, 14(2), 57-72.
- Russeng, S. S., Salmah, A. U., Saleh, L. M., Achmad, H., & NR, A. R. (2020). The influence of workload, body mass index (BMI), duration of work toward fatigue of nurses in Dr. M. Haulussy General Hospital Ambon. *Age*, 21(25), 26-30.
- Umansky, J., & Rantanen, E. (2016). Workload in Nursing. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 60(1), 551-555. <https://doi.org/10.1177/1541931213601127>
- World Health Organization. (2022). WHO results report 2020–2021: For a safer, healthier and fairer world. World Health Organization. <https://www.who.int/about/accountability/result/s/who-results-report-2020-2021>
- Yazıcıoğlu, Y., & Erdoğan, S. (2014). *SPSS uygulamalı bilimsel araştırma yöntemleri*. Detay Yayıncılık.
- Zarea, K., Mohammadi, A., Beiranvand, S., Hassani, F., & Baraz, S. (2018). Iranian nurses' medication errors: A survey of the types, the causes, and the related factors. *International Journal of Africa Nursing Sciences*, 8, 112–116. doi:10.1016/j.ijans.2018.05.001