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İÇİNDEKİLER / CONTENTS

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Validity and Reliability of the Turkish Version of the Adolescent Sexual and Reproductive Competency Assessment Tool for Healthcare Providers

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ABSTRACT

Objective: This study aimed to test the validity and reliability of the Adolescent Sexual and Reproductive Competence Assessment Tool for Healthcare Providers and to adapt it cross-culturally into Turkish. **Material and Methods:** This study employed a methodological approach, which involved interviewing 402 nurses and doctors working in two state hospitals between August and December 2023. Data were collected using the "Descriptive Characteristics Form" and the "Adolescent Sexual and Reproductive Competence Assessment Tool for Healthcare Providers". The analysis and evaluation included factor analysis, Cronbach's alpha analysis, item-total score correlation analysis, content validity, construct validity, and concurrent validity. **Results:** Adolescent Sexual and Reproductive Competence Assessment Tool for Healthcare Providers demonstrated high reliability, as indicated by item-total correlation values that ranged from 0.491 to 0.789. The tool exhibited a four-factor structure, explaining 64% of the total variance in the measured variables. **Conclusion:** The Turkish version of the Adolescent Sexual and Reproductive Competence Assessment Tool for Health Care Providers demonstrated high validity and reliability in the Turkish population.

Keywords: Adolescent, Cross-cultural Translation, Healthcare, Reproductive Health, Sexual Health.

Sağlık Bakım Sağlayıcılar için Adölesan Cinsel ve Üreme Yetkinliğini Değerlendirme Aracının Türkçe Versiyonunun Geçerlik ve Güvenirliği

ÖZ

Amaç: Bu çalışmanın amacı Sağlık Bakım Sağlayıcılar için Adölesan Cinsel ve Üreme Yetkinliğini Değerlendirme Aracı'nın geçerlik ve güvenirliğini test etmek ve kültürlerarası olarak Türkçe'ye uyarlamaktı. **Gereç ve Yöntem:** Bu çalışmada, Ağustos-Aralık 2023 tarihleri arasında iki devlet hastanesinde çalışan 402 hemşire ve doktorla görüşmeyi içeren metodolojik yaklaşım kullanılmıştır. Veriler "Tanımlayıcı Özellikler Formu" ve "Sağlık Bakım Sağlayıcılar İçin Adölesan Cinsel ve Üreme Yetkinliğini Değerlendirme Aracı" kullanılarak toplanmıştır. Analiz ve değerlendirme, faktör analizini, Cronbach's alfa analizini, madde-toplam puan korelasyon analizini, içerik geçerliliğini, yapı geçerliğini ve eşzamanlı geçerliği içermiştir. **Bulgular:** Sağlık Bakım Sağlayıcılar İçin Adölesan Cinsel ve Üreme Yetkinliğini Değerlendirme Aracı 0.491 ile 0.789 arasında değişen madde-toplam korelasyon değerlerinin gösterdiği gibi yüksek güvenilirlik göstermiştir. Bu araç ölçülen değişkenlerdeki toplam varyansın %64'ünü açıklayan dört faktörlü bir yapı sergilemiştir. **Sonuç:** Sağlık Bakım Sağlayıcıları İçin Adölesan Cinsel ve Üreme Yetkinliğini Değerlendirme Aracı'nın Türkçe versiyonu Türk toplumunda yüksek geçerlik ve güvenirlik göstermiştir.

Anahtar Kelimeler: Adölesan, Kültürlerarası Çeviri, Sağlık Bakımı, Üreme Sağlığı, Cinsel Sağlık.

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INTRODUCTION

The transition from childhood to adulthood, as defined by the WHO, is referred to as adolescence, spanning ages 10 to 19 (WHO, 2023). The global adolescent population is rising, constituting one-sixth of the world's population with a significant majority residing in countries with lower and middle incomes (Azzopardi et al., 2019).

Adolescence is marked by numerous physical, social, and cognitive changes (Kågesten & van Reeuwijk, 2021). Despite being a generally healthy phase of life, it is also characterized by a substantial occurrence of illnesses, injuries, and deaths (Chandra-Mouli et al., 2019). Critical health issues during adolescence include low physical activity, inadequate nutrition, traffic accidents, suicide, alcohol use, interpersonal violence, sexual abuse, and unsafe sex (Azzopardi et al., 2019). Risk behaviours such as early sexual debut, having more than one sexual partner, unplanned sexual intercourse and inconsistent contraceptive use can be seen in both girls and boys during adolescence. In a study, it was reported that a significant proportion of young boy engaged in worrying sexual behaviours such as having sexual intercourse at an earlier age and having more sexual partners than girls adolescents (Eaton et al., 2012; Grubb et al., 2020). Adolescent girls, in particular, are disproportionately affected by partner violence, with unsafe abortions and pregnancy complications being the leading causes of death among them (Chandra-Mouli et al., 2019). Many of the deaths and illnesses during adolescence are preventable or treatable. However, restrictive laws and policies, limited privacy, and healthcare providers' biases can hinder adolescents' access to the care they need (Karim et al., 2023; WHO, 2023). Adolescent sexual and reproductive health (ASRH) issues worsen due to a lack of information and limited access to available services (Thongmixay et al., 2019).

Comprehensive sexual health education can reduce risky sexual behaviors (Pavelová et al., 2021; Weiss et al., 2018). Therefore, gaining accurate information about ASRH and access to services becomes crucial. Providers of ASRH services need to be trained with specialized skills (Thongmixay et al., 2019). There are few studies in the existing literature that focus on addressing ASRH issues (Aslan, 2020; Ünal Toprak & Turan, 2021). Turkish society, due to socio-cultural factors, sexuality is still perceived as taboo despite varying levels of education and cultural backgrounds. It is crucial for healthcare providers, particularly doctors and nurses who constitute a significant structure, to provide a holistic approach without allowing their cultural and moral values to influence their professional practices.

Given the potential societal variations in behaviors and attitudes about ASRH problems, each community needs to possess a suitable, valid, and reliable measurement tool. The instrument developed by Karim et al. (2023) to assess knowledge, attitudes, and behaviors related to ASRH issues in adolescents is valid and reliable among doctors and nurses (Karim et al., 2023). However, in Turkey, there is a lack of information on the validity and reliability of the scale measuring nurses' and doctors' knowledge, attitudes, and behaviors regarding ASRH issues in adolescents. This study aimed to test the validity and reliability of the Adolescent Sexual and Reproductive Competence Assessment Tool for Healthcare Providers and to adapt it cross-culturally into Turkish. In line with this general objective, the research questions are: (1) Is the Turkish version of ASRH-CAT a valid tool? (2) Is the Turkish version of ASRH-CAT a reliable tool?

MATERIALS AND METHODS

Participants

When performing validity and reliability studies, it is recommended to ensure that the sample size is 5-10 times larger than the number of items in the relevant scale (Anthoine et al., 2014). As the initial scale comprises 40 items, we enlisted 402 healthcare providers, including both nurses and doctors, employed at two state hospitals from August to December 2023. Inclusion criteria encompassed individuals (1) practicing as nurses or doctors, (2) serving in family health centers, obstetrics, gynecology, or pediatric services, and (3) expressing willingness to partake in the research.

Data collection

Data were collected between August and December 2023. Data collection and informed consent forms were transferred to Google Forms. The survey link for the data collection form, created using the Google Forms application, was shared with nurses and doctors via social media channels. The nurses and doctors who agreed to participate in the study gave their consent. Data were gathered through the utilization of the "Descriptive Characteristics Form" and "Adolescent Sexual and Reproductive Competency Assessment Tool for Healthcare Providers".

Data collection tools

Descriptive Characteristics Form: This form contains information about participants' gender, education level, profession, age, and work experience

The Adolescent Sexual and Reproductive Competency Assessment Tool (ASRH-CAT) for Healthcare Providers: Karim et al. (2023) developed this tool designed for nurses and doctors in primary healthcare institutions, requiring specific competency skills to address sexual and reproductive health issues during adolescence. The instrument consists of 40 items and has four subscales. The evaluation employs a five-point Likert scale. During the preliminary inquiry, the instrument exhibited positive item-total correlation and internal consistency, with Cronbach's alpha values (α) ranging from 0.905 to 0.949 (Karim et al., 2023).

Cross-cultural adaptation

We adhered to a manual designed for the cross-cultural adaptation process of self-report scales. As per the guidelines, the procedure encompassed translation,

synthesis of translations, back-translation, soliciting expert opinions, evaluating the pre-final version, and making necessary adaptations.

Translation

The initial phase of the adaptation process was translation. Initially, two bilingual translators, with Turkish as their native language, independently translated the English version of the scale to create a unified version (Beaton et al., 2000). Each translator documented their translation process in a written report. The researchers later met to integrate the findings of the translations. Two translators, having no prior exposure to the original version, separately prior exposure to the original version, separately retranslated the questionnaire to the original language in the next phase. Two native English speakers performed back-translations. Neither translator was familiar with the concepts being investigated. After reaching a consensus, a draft scale was created.

Expert opinion

Feedback was obtained from nine experts with expertise in pediatrics, pediatric nursing, and child development to evaluate the scope validity of the Turkish version of the scale. These professionals were responsible for evaluating the scale items using. The Lawshe content validity ratio and index were utilized to determine content validity at the item level (Lawshe, 1975).

Pilot application

The last phase of the adaptation investigation included a pilot application. In order to evaluate the comprehensibility of the Turkish version, a pilot study was conducted with the participation of 20 nurses and doctors who were not included in the sample. Each participant filled out the form, and interviews were conducted to understand the meaning of each item and selected response.

Analysis

The data underwent testing for reliability and validity through the IBM SPSS Version 22.0 software. Descriptive statistics, including frequencies, percentages, arithmetic mean, and median, were employed. Scope validity ratios and values were scrutinized to establish scope validity. For scale validity analyses and sample size determination, Bartlett's test of sphericity and Kaiser-Mayer-Olkin (KMO) tests were applied to assess the adequacy of the dataset. Exploratory factor analysis (EFA) utilized Principal Component Analysis (PCA), and the validity of the resulting structure was affirmed through confirmatory factor analysis (CFA). Internal consistency was gauged using α coefficient. The Pearson correlation test examined the relationship between measurements in the test-retest of the scale. Results were considered statistically significant at a 95% confidence interval, $p<0.05$.

Ethics

Permission and documents (from Rosnah Sutan) were obtained via email to conduct the original scale's Turkish validity and reliability study. Ethical approval was granted by the ethics committee (Protocol No: 2023-SBB-0401, Decision Date: 12.07.2023, Decision No: 14). There is an informed consent form that must be read and approved by the nurse and doctor before the data collection form can be viewed. The online data collection form was completed by the nurse and doctor who filled out the informed consent form and voluntarily agreed to participate in this study. In order to ensure data security in the study, all electronic documents were saved on locked computers and were only accessible by the researchers.

RESULTS

Demographics

Of the participants 79.9% were female and the majority (66.4%) were university graduates. Most of the participants (68.9%) were nurses and the mean age was 32.82±6.98 years (22-61). The mean work experience was 8.33±6.85 years (1-41) (Table 1).

Content validity

The scale was presented to nine experts for content validity. Based on expert evaluations, the content validity ratios of the items were analyzed. Five items with content validity ratios below 0.75 were excluded at this stage. While the content validity ratios of the remaining items ranged from 0.75 to 1.0, the scale's content validity index was 0.91.

Table 1. Demographic characteristics of the participants (n=402).

Characteristics	n	%
Gender		
Female	321	79.9
Male	81	20.1
Education level		
High school	6	1.5
University	267	66.4
Degree	93	23.1
Doctorate	36	8.4
Profession		
Nurse	277	68.9
Doctor	125	31.1
Age (years) **Mean ± SD** **Min- Max**		 32.82±6.98 22-61
Work experience **Mean±SD** **Min- Max**		 8.33±6.85 1–41

SD: Standart deviation, **Min-Max:**Minimum-Maximum, **n:**number of sample, **%:**percent.

Construct validity

In the scale's construct validity, seven items with factor loadings below 0.40 and cross-loading values were excluded at this stage, resulting in a final scale of 28 items. The scale's Kaiser-Meyer-Olkin (KMO) value was found to be 0.764. The $\chi 2$ value in the Bartlett sphericity test was 743.100 and was statistically significant ($p<0.001$). The scale exhibited a four-factor structure with eigenvalues greater than one for each factor, explaining 64% of the total variance in the measured variables (Figure 1, Table 2).

Table 2. Results of explanatory factor analysis (n=402).

Items	Factors				Kaiser–Meyer–Olkin measure	Bartlett's test of sphericity	Eigenvalue	Explained variance
	1	2	3	4				
I1		0.715			0.764	743.100	3.626	63.934
I2		0.695				p<0.001		
I3		0.583						
I4		0.604						
I5		0.624						
I6		0.704						
I7		0.640						
I8				0.637				
I9				0.677				
I10				0.658				
I11				0.678				
I12				0.713				
I13				0.647				
I14				0.611				
I15	0.813							
I16	0.646							
I17	0.686							
I18	0.767							
I19	0.821							
I20	0.847							
I21	0.552							
I22	0.644							
I23	0.806							
I24	0.780							
I25			0.742					
I26			0.700					
I27			0.686					
I28			0.762					

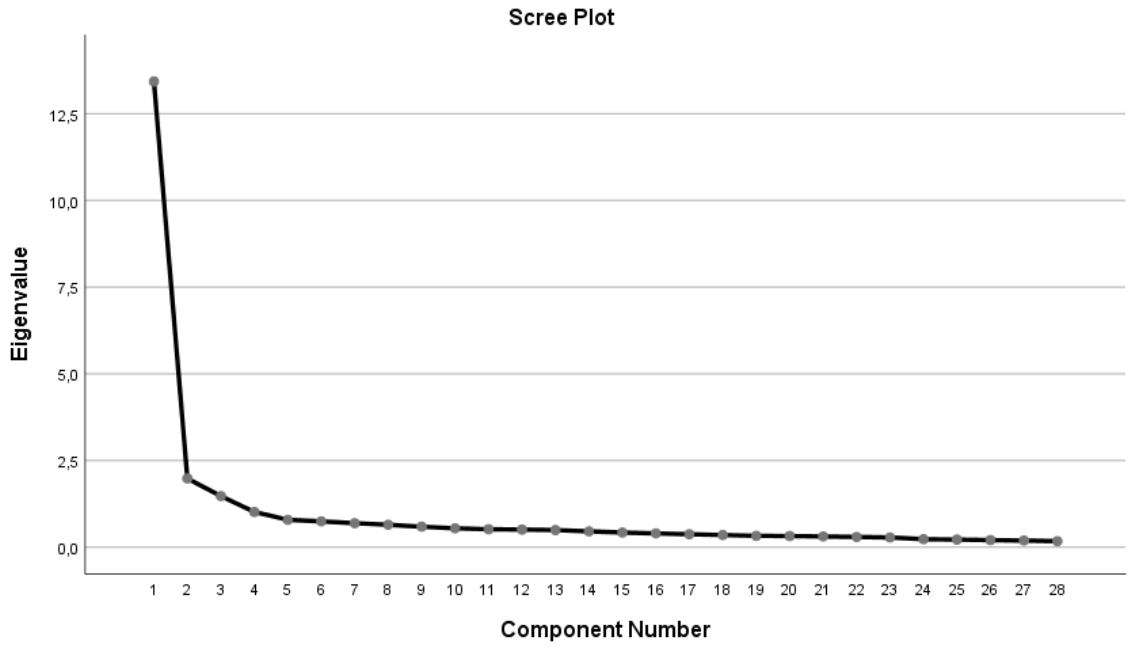

Figure 1. It graphically shows that the scale has a factor with an eigenvalue>1.

Confirmatory factor analysis (CFA)

The goodness-of-fit indices obtained from CFA were as follows: $\chi 2/df=2.055$, RMSEA (root mean square error of approximation) =0.006, CFI (comparative fit index)=0.97, AGFI (adjusted goodness-of-fit index)=0.96, and GFI (goodness of fit index)=0.97. The fit indices from confirmatory factor analysis indicated a very good fit (Table 3, Figure 2).

Table 3. Goodness of fit criteria of the scale (n=402).

Compliance criteria	Criteria	Goodness of fit results
Chi-square/df	Chi-square/sd < 3	3.055
RMSEA	0 ≤ RMSEA ≤ 1.00	0.06
CFI	≥ 0.90	0.97
AGFI	0.90≤ CFI≤ 1.00	0.96
GFI	0.95 ≤ AGFI ≤ 1.00	0.97

RMSEA: Root mean square error of approximation, SRMR: Standardized root mean square residual, CFI: Comparative fit index, AGFI: Adjusted goodness of fit index, GFI: Goodness of fit index

Table 4. Item-total correlation and internal consistency analysis results of the scale (n=402).

	Factors			
Items	**1**	**2**	**3**	**4**
I1		0.581		
I2		0.661		
I3		0.612		
I4		0.593		
I5		0.592		
I6		0.610		
I7		0.694		
I8		0.581		0.694
I9				0.725
I10				0.729
I11				0.507
I12				0.491
I13				0.716
I14				0.703
I15	0.774			
I16	0.688			
I17	0.745			
I18	0.789			
I19	0.792			
I20	0.786			
I21	0.718			
I22	0.789			
I23	0.758			
I24	0.783			
I25			0.474	
I26			0.528	
I27			0.436	
I28			0.471	
Cronbach's alpha coefficient (subscales)	0.779	0.766	0.841	0.676
Cronbach's alpha coefficient (Scale-total)	0.859			

Reliability

Cronbach's alpha was employed to assess the internal consistency of the scale. Cronbach's alpha coefficient of the total scale was 0.859. Additionally, the sub-dimensions exhibited coefficients of 0.779, 0.766, 0.841, and 0.676, respectively. The item-total score correlation coefficients for the overall scale, consisting of 28 items, varied from 0.491 to 0.789 (Table 4).

In the pre-test phase, we evaluated the reliability of the test-retest with thirty nurses and doctors engaged in sexual and reproductive health services. The assessments were conducted at two-week intervals to ascertain the consistency of responses. The correlation between test-retest measurements of the scale was 0.438 (p=0.003) (Table 5).

Table 5. The correlation between test-retest measurements of the scale.

ASRH-CAT	Re-test
Pre-test	r=0.438
	p=0.003

[a] Pearson correlation test *p<0.05

DISCUSSION

This study aimed to adapt ASRH-CAT into Turkish and test its validity and reliability. In this study, ASRH-CAT exhibited a four-factor structure. The α coefficients for the sub-factors and the total score were 0.779, 0.766, 0.841, 0.676, and 0.859, respectively. The correlation between test-retest measurements of the scale was 0.438. Based on these findings, it can be said that the Turkish version of ASRH-CAT is culturally appropriate.

In this study, the ASRH-CAT revealed a structure comprising four factors, and these four factors for 64% of the total variance observed in the measured variables this indicates a strong construct validity (Polit et al., 2007). Similarly, in the original study by Karim et al. (2023), ASRH-CAT also showed a four-factor structure.

The most frequently employed approach for establishing measurement validity is content validity (Grant & Davis, 1997). This method necessitates experts reaching a consensus regarding the accuracy and sufficiency of the proposed content (Crestani et al., 2017). In the current study, input from nine experts was sought. During this stage, five items with a content validity ratio below 0.75 were excluded, adhering to the guidelines outlined by Lawshe (1975). Construct validity of the scale was assessed through EFA and CFA. In the case of multi-dimensional scales, it is advised that the explained variance should be a minimum of 40 (Terwee et al., 2007). During this stage, seven items with factor loadings below 0.40 and cross-loading values were omitted, yielding a final scale comprising 28 items. The values identified in this study align with those from the original study, providing support for this structure. Goodness-of-fit indices calculated using the CFA method indicated that the tested model had a very good fit (>0.90) (MacCallum et al., (1996). A comparison could not be made with Karim et al. (2023)'s original study as they did not report goodness-of-fit indices.

determine the internal consistency of ASRH-CAT (Koo & Li, 2016). In this study, the α coefficients for the sub-dimensions of self-perceived ability in providing ASRH education, self-perceived ability in ASRH management, self-perceived sufficient knowledge in decision-making, and perceived appropriate attitude towards ASRH management were 0.779, 0.766, 0.841, and 0.676, respectively. For the total scale, it was 0.859. These values indicate that ASRH-CAT exhibits high reliability. Karim et al. (2023) reported α coefficients for the sub-dimensions of self-perceived ability in providing ASRH education, self-perceived ability in ASRH management, self-perceived sufficient knowledge in decision-making, and perceived appropriate attitude towards ASRH management as 0.932, 0.949, 0.946, and 0.905, respectively. For the total scale, it was 0.933. These results show similarity with the original scale's outcomes, indicating high internal consistency (Barbera et al., 2021; Karim et al., 2023).

In this study, item-total score correlations for ASRH-CAT range between 0.491 and 0.789. The item-total score correlation coefficient for a given item provides information about the relationship between the scores of that item and the scores of all other items, and it is suggested that the item correlation value should be 0.30 (Sibel & Berat, 2020; Zijlmans et al., 2019). According to these results, it can be stated that all items have a high correlation with the total score. Karim et al. (2023) found item-total score correlations for ASRH-CAT ranging from 0.434 to 1.000.

In this study, a test-retest was conducted at two-week intervals with thirty nurses and doctors working in ASRH. The findings indicate that participants responded similarly in both measurements, suggesting that the items accurately and comprehensibly represent the subject matter. In the original study of the scale, test-retest reliability was tested by repeating responses with six healthcare providers working in sexual and reproductive health services at two-week intervals.

Access to ASRH can be restricted due to socio-cultural norms and taboos (Mazur et al., 2018). Additionally, non-supportive attitudes of healthcare providers, towards adolescents, insufficient emphasis on patient privacy, concerns about the confidentiality of shared information with healthcare providers, difficulties in accessing healthcare institutions, and the provision of low-quality services are factors that hinder adequate utilization of healthcare services (Cappiello et al., 2016). Self-assessment scales to evaluate the competence of healthcare providers, can improve their performance, encourage open communication with adolescents, and enhance the quality of care. The relatively low number of items in the scale facilitates the ease of use. Moreover, considering the absence of a scale to assess the knowledge, attitudes, and behaviors of nurses and

doctors regarding ASRH issues, it is believed that the scale will guide future research in Turkey.

In this study, item-total score correlations for ASRH-CAT range between 0.491 and 0.789. The item-total score correlation coefficient for a given item provides information about the relationship between the scores of that item and the scores of all other items, and it is suggested that the item correlation value should be 0.30 (Sibel & Berat, 2020; Zijlmans et al., 2019). According to these results, it can be stated that all items have a high correlation with the total score. Karim et al. (2023) found item-total score correlations for ASRH-CAT ranging from 0.434 to 1.000.

Limitations and Strengths

Studying has some limitations. Firstly, while the study's sample size is sufficient, the results may not be generalizable as they only include nurses and doctors working in hospitals in two provinces. Secondly, the responses were collected based on self-reporting.

CONCLUSION

The research results demonstrate that ASRH-CAT is a highly reliable scale and measurement tool in Turkey. It is recommended to use the scale to assess the competence of healthcare providers in managing and making decisions about adolescent sexual and reproductive health. Additionally, to strengthen the validity and reliability of the scale further, it can be examined by including a larger sample group that encompasses nurses and doctors working in private hospitals and other healthcare institutions.

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Conflict of Interest

The author declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Author Contributions

Plan, design: FD, AK, AP; **Material, methods and data collection:** FD, AK, AP; **Data analysis and comments:** FD, AK; **Writing and corrections:** FD, AK, AP.

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Ethical Approval

Institution: Bartın University Social and Human Sciences Ethics Board
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Evaluation of the Effectiveness of Venous Thromboembolism Prophylaxis in Patients Undergoing Major Urological Surgery

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ABSTRACT

Objective: To evaluate the effectiveness of venous thromboembolism prophylaxis in patients undergoing majör urologic surgery. **Materials and Methods:** Data of patients who underwent major urological surgery between January 2018 and October 2023 were analyzed. Intraoperative age, body mass index, and comorbidities were recorded. All patients received prophylaxis with low molecular weight heparin and graduated compression stockings starting in the preoperative period until mobilization in the postoperative period. The patients' historical data were reviewed, and the development of venous thromboembolism in the one-month postoperative period was investigated. **Results:** Nephrectomy was performed in 156 patients (45.2%), radical prostatectomy in 142 patients (41.2%), partial nephrectomy in 28 patients (8.1%), and radical cystectomy in 19 patients (5.5%). The mean age at the time of operation was 66.06±9.43 years, and the body mass index was 27.06±4.22. Hypertension was found in 51.6%, diabetes mellitus in 26.1%, coronary artery disease in 13.9%, chronic obstructive pulmonary disease in 8.1%, atrial fibrillation in 2.1%, and valvular heart disease in 1.2%. In the postoperative period, two patients developed pulmonary embolism, and one patient developed deep vein thrombosis. One of the patients with pulmonary embolism had undergone radical prostatectomy, and the other patients had undergone radical cystectomy. There was no mortality after treatment. **Conclusion:** Venous thromboembolism is highly preventable when appropriate precautions and prophylaxis are taken. In our study, the incidence of pulmonary embolism and deep vein thrombosis was similar to the literature.

Keywords: Prophylaxis, Urological surgical procedures, Venous thromboembolism.

Majör Ürolojik Cerrahi Geçiren Hastalara Uygulanan Venöz Tromboemboli Profilaksisinin Etkinliğinin Değerlendirilmesi

ÖZ

Amaç: Araştırmada majör ürolojik cerrahi geçiren hastalara uygulanan venöz tromboemboli profilaksisinin etkinliğinin değerlendirilmesi amaçlandı. **Gereç Yöntem:** Ocak 2018 ve Ekim 2023 tarihleri arasında majör ürolojik cerrahi geçiren hastaların verileri incelendi. Hastaların operasyon sırasındaki yaşları, vücut kitle indeksleri, ek hastalıklarına dair veriler kaydedildi. Tüm hastalara postoperatif dönemde mobilize olana kadar preoperatif dönemde başlanarak düşük molekül ağırlıklı heparin ve dizüstü varis çorabı ile profilaksi uygulandı. Hastaların geçmiş verileri taranarak operasyon sonrası bir aylık periyodda venöz tromboemboli gelişip gelişmediği araştırıldı. **Bulgular:** Hastaların 156'sına (%45,2) nefrektomi, 142'sine (%41,2) radikal prostatektomi, 28 hastaya (%8,1) parsiyel nefrektomi ve 19 hastaya (%5,5) radikal sistektomi yapıldığı saptandı. Hastaların operasyon sırasındaki yaş ortalaması 66,06 ±9,43, vücut kitle indeksleri 27,06±4,22 olarak saptandı. Ameliyat edilen hastalarda %51,6 hipertansiyon, %26,1 Diyabetes Mellitus, %13,9 Koroner arter hastalığı, %8,1 Kronik obstrüktif akciğer hastalığı, %2,1 atriyal fibrilasyon, %1,2 kalp kapak hastalığı saptandı. Postoperatif dönemde 2 hastada pulmoner emboli ve 1 hastada derin ven trombozu geliştiği saptandı, pulmoner emboli gelişen hastalardan biri radikal prostatektomi, diğer hastalar ise radikal sistektomi operasyonu geçirmişti. Tedavi sonrası hastalarda mortalite gelişmedi. **Sonuç:** Venöz tromboembolizm uygun önlemler alınıp profilaksi uygulandığı zaman yüksek oranda önlenebilir bir durumdur. Çalışmamızda da pulmoner emboli ve derin ven trombozu görülme sıklığı literatür ile benzer olarak saptanmıştır.

Anahtar Kelimeler: Profilaksi, Ürolojik cerrahi işlemler, Venöz tromboembolizm.

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INTRODUCTION

Venous thromboembolism (VTE) is a vascular disease, including deep vein thrombosis and pulmonary embolism (PE), and is a severe complication of medical and surgical conditions (Al-Mugheed & Bayraktar, 2018; Oh et al., 2017). Risk factors include obesity, advanced age, immobilization (bed rest for more than four days), history of thrombotic events, inflammatory diseases, cancer, pregnancy, family history of VTE, smoking, estrogen treatments, and previous surgery (Irmak et al., 2022; Pastori et al., 2023). VTE prophylaxis aims to prevent VTE before it occurs in risky patient groups (Rice et al., 2010). VTE is a severe complication of urologic surgery and PE and one of the most common causes of death in patients undergoing major urologic surgery (Rice et al., 2010; Tikkinen et al., 2014). Although prophylaxis reduces mortality, thrombophylaxis also increases the risk of bleeding (Violette et al., 2016). Mechanical and/or pharmacologic methods can be used in VTE prophylaxis. Mechanical prophylaxis methods include graduated compression stockings, intermittent pneumatic compression, and foot compression devices (Al-Mugheed & Bayraktar, 2018). The most commonly used pharmacologic methods in urological surgeries include the use of unfractionated heparin and low molecular weight heparin (Rice et al., 2010). These methods can be applied alone or in combination according to the patient's risk factors and the operation to be performed (Kakkos et al., 2022; Nam et al., 2017). In patient groups where primary prophylaxis is inadequate or inappropriate, early diagnosis and treatment of VTE in the postoperative period is recommended (Tikkinen et al., 2014). Risk-adaptive prophylaxis is currently recommended in European Association of Urology (EAU) guidelines (Tikkinen et al., 2014). In this context, the aim of this study was to evaluate the effectiveness of VTE prophylaxis in major urologic surgeries.

MATERIALS AND METHODS

Study type

The retrospective study was conducted in the Urology clinic of a university hospital between 01.12.2023 and 01.02.2024.

Study group

The study population consisted of 345 patients who underwent major urologic surgery (Cystectomy, Nephrectomy, Partial Nephrectomy, Radical Prostatectomy) between 01.01.2018 and 31.10.2023. The data of 345 patients constituted the sample of the study.

Data collection

Microsoft Office Excel program was used for data collection. Information including age, gender, previous history of embolism, ASA classification, height, and weight were recorded. Data were collected through the MIA operating system used in the hospital. Patients were divided into low, intermediate, and high-risk groups according to the risk-adjustment method recommended in the current EAU guidelines (Tikkinen et al., 2014).

Venous thromboembolism prophylaxis Standard practices were initiated in 2018, considering the guidelines published to prevent the development of VTE after major urologic surgery (Tikkinen et al., 2022). Mechanical and pharmacologic methods were applied to provide pre-and postoperative VTE prophylaxis in patients undergoing surgery.

- History was taken (previous VTE in the family and patient's history).
- Mechanical prophylaxis with graduated compression stockings was applied until mobilization in the postoperative period.
- The first mobilization in the postoperative period was performed between 8-16 hours postoperatively.
- Patients who developed VTE were followed up closely with Pulmonology, and anticoagulant therapy was administered at the appropriate dose.

Statistical analysis

The results were evaluated using the Statistics 25 program" (IBM SPSS- Statistical Package for the Social Sciences For Windows). The results were evaluated at a 95% confidence interval, and significance was assessed at $p<0.05$. Number and percentage distribution, as well as mean and standard deviation, were used to analyze the data.

Ethical considerations

Ethics committee approval from Balikesir University and institutional permission from the institution where the research will be conducted were obtained (Date: 08.11.2023, Approval no: 2023/115). The principles of the Declaration of Helsinki conducted the study.

RESULTS

Nephrectomy was performed in 156 patients (45.2%), radical prostatectomy in 142 patients (41.2%), partial nephrectomy in 28 patients (8.1%), and radical cystectomy in 19 patients (5.5%). The mean age at the time of operation was 66.06±9.43 years, and the body mass index was 27.06±4.13. Hypertension was found in 51.6%, diabetes mellitus in 26.1%, coronary artery disease in 13.9%, chronic obstructive pulmonary disease in 8.1%, atrial fibrillation in 2.1%, and valvular heart disease in 1.2%. The distribution of demographic data according to the operation performed is given in Table 1. VTE risk distribution of patients according to current EAU guidelines is shown in Table 2. In the postoperative period, two patients developed PE, and one patient developed deep vein thrombosis. One of the patients with PE had undergone radical prostatectomy, and the other patients had undergone radical cystectomy.

There was no mortality after appropriate treatment. Postoperative complications are given in Table 3.

Table 1. Distribution of demographic data according to the surgery performed on the patients.

Type of surgery / Patient characteristics	Nephrectomy (n=156)	Radical prostatectomy (n=142)	Partial nephrectomy (n=28)	Radical cystectomy (n=19)	Major urological surgery (n=345)
Average age	64.74±11.44	67.59±5.51	62.75±11.05	70.37±8.99	66.06±9.43
BMI average	27.30±4.58	26.88±3.19	29.08±5.60	23.83±4.18	27.06±4.22
<25	49	39	4	12	104
25-29.9	60	79	17	5	161
30-34.9	40	21	4	2	67
≥35	7	3	3	0	13
Gender					
Female	53	0	12	3	68
Male	103	142	16	16	277
Chronic disease					
DM	42	32	10	6	90
Hypertension	80	66	13	8	167
KAH	20	20	5	3	48

Table 2. VTE risk model according to current EAU guidelines.

Risk classification	Risk	VTE probability	n	%
Low risk	Risk factor (-)	1x	284	82.3
Medium risk	One of the following risk factors; ➢ Age ≥ 75 ➢ BMI ≥ 35 ➢ VTE in 1st degree relatives (mother, father, sibling)	2x	 48 11 0	17.2
High risk	Anamnesis of VTE ➢ Having 2 or more risk factors	4x	2	0.5

Table 3. Postoperative complications in patients.

Type of complication / Type of surgery	n	Pulmonary embolism		Deep vein thrombosis		VTE	
		n	%	n	%	n	%
Nephrectomy	156	0	0	0	0	0	0
Radical prostatectomy	142	1	0.7	0	0	1	0.7
Partial nephrectomy	28	0	0	0	0	0	0
Radical cystectomy	19	1	5.2	1	5.2	2	10.5
Total	345	2	0.5	1	0.2	3	0.8

DISCUSSION

Urological surgeries, especially in the pelvic region, and restriction of mobility in the postoperative period increase the susceptibility to venous thromboembolism. Venous thromboembolism is a preventable condition, and mortality can be reduced with early diagnosis and treatment.

There is a trade-off between bleeding risk and VTE risk reduction when deciding on pharmacologic prophylaxis in urologic surgery (Forrest et al., 2009; Tikkinen et al., 2014; Violette et al., 2016). High-grade evidence suggests that 50% of postoperative bleeding occurs in the first 24 hours and 90% in the first 4 days, while VTE occurs in the first 4 weeks postoperatively (Amin et al., 2011; Devereaux et al., 2014; Sweetland et al., 2009; Tikkinen et al., 2014). For this reason, there are various protocols in terms of the timing of pharmacologic prophylaxis, such as preoperative, preoperative+first 7 days, starting 24 hours postoperatively, and prophylaxis for 7 days, or prophylaxis for 30 days (Sertkaya et al., 2014; Shakiba et al., 2024). EAU guidelines suggest that it may be appropriate to start pharmacologic prophylaxis after 24 hours postoperatively (Tikkinen et al., 2022). However, preoperative administration of the first dose significantly reduces VTE (Reinke et al., 2012). Currently, there is no randomized controlled trial in the literature comparing the timing of administration of pharmacological prophylaxis. In this study, patients received pharmacologic prophylaxis in the preoperative period 12 hours before the operation. The rate of VTE is 1% in 196,915 patients who underwent major urological surgery, which was found to be 0.8% in this study, and our complication rates are similar to the current literature (Cano Garcia et al., 2023).

Another type of thrombophylaxis is mechanical prophylaxis. Meta-analyses have found that mechanical prophylaxis reduces the risk of VTE by 50% (Tikkinen, Craigie, Agarwal, Siemieniuk, et al., 2018; Tikkinen, Craigie, Agarwal, Violette, et al., 2018). Graduated compression stockings, intermittent pneumatic compression, and foot compression devices are used in mechanical prophylaxis (Al-Mugheed & Bayraktar, 2018). These methods should be used alone or with pharmacologic prophylaxis (Kakkos et al., 2022; Nam et al., 2017). One of the most commonly used types is graduated compression stockings, which protect from venous stasis by regulating venous flow (Speth, 2023). Patient compliance is essential in these applications; some patients may develop skin wounds, ulcers, discomfort, and perineuronal nerve palsy (Speth, 2023). All patients included in this study received above-knee graduated compression stockings as mechanical prophylaxis. Patient treatment compliance may also be influential in the low incidence of VTE.

The incidence of VTE and PE after urologic surgeries is 0.2-7.8% and 0.2-7%, respectively (Rice et al., 2010). Various risk factors for VTE have been defined as preoperative, intraoperative, and postoperative. Conditions such as advanced age, obesity, malignancy, history of VTE, and DM are some of the preoperative risk factors; conditions such as prolonged operation, blood loss, and reoperation are intraoperative; immobility, sepsis, and MI are some of the postoperative risk factors (Irmak et al., 2022; Pastori et al., 2023).

The Caprini risk score is the most commonly used and validated score to estimate VTE risks, but its detailed patient information poses challenges for urologists to use in clinical practice (Golemi et al., 2019). Urologists prefer to use patient-based risk classifications, which are simpler, faster, and valid, as recommended by the EAU (Tikkinen et al., 2014). In this study, 82% of patients were in the low-risk group, 17% in the intermediate-risk group, and 0.5% in the high-risk group.

Although pharmacologic prophylaxis generally covers the first postoperative week, extended prophylaxis covering 30 days postoperatively is recommended for high-risk patients undergoing major pelvic surgery (Rausa et al., 2018). According to four retrospective studies and one population-based cohort study on radical cystectomy, the major urological surgery with the highest morbidity and mortality, postoperative mortality was 2.1-3.2% in the first 30 days and 3.4-8.0% in the first 90 days (Bochner et al., 2015; Mossanen et al., 2019). A study that included approximately 14,000 radical cystectomy patients showed that VTE and PE rates were 2.6% and 1.2% after radical cystectomy, respectively (Cano Garcia et al., 2023). This study's rate was 10.5% for VTE and 5.2% for PE. This difference in the literature may be related to the duration of pharmacologic prophylaxis. Extended prophylaxis seems to be advantageous for radical cystectomy patients and open radical prostatectomy patients (Naik et al., 2019). Current EAU guidelines recommend mechanical and pharmacologic prophylaxis for all radical cystectomy patients regardless of risk group (Tikkinen et al., 2022).

While VTE rates after open radical prostatectomy vary between 0.9% and 15.7%, this rate can be as low as 0.2% in robotic radical prostatectomy (Cano Garcia et al., 2023; Chen et al., 2016; Naik et al., 2019). Although extended prophylaxis after radical prostatectomy appears to be safe and effective, tolerance to mechanical prophylaxis is low (Cindolo et al., 2009). EAU guidelines recommend mechanical and pharmacologic prophylaxis in open radical prostatectomy (Tikkinen et al., 2022). Suppose radical prostatectomy is to be performed robotically or laparoscopically. In that case, mechanical prophylaxis remains constant in EAU recommendations, but pharmacologic prophylaxis varies according to the patient's risk and whether lymph node dissection will be performed (Tikkinen et al., 2022).

Patients in this study underwent open radical prostatectomy and developed VTE and PE at a rate of 0.7%, similar to the literature (Cano Garcia et al., 2023). After radical nephrectomy, VTE is observed at a rate of 1.1% and PE at 0.5% (Cano Garcia et al., 2023). After partial nephrectomy, the rate of VTE is 0.6%, and PE is 0.4% (Cano Garcia et al., 2023).

Pharmacologic prophylaxis after partial nephrectomy may be risky in terms of postoperative bleeding (Rice et al., 2010). A recent study found that pharmacologic prophylaxis administered once preoperatively in partial nephrectomy patients did not increase bleeding but did not change the risk of a VTE (Dai et al., 2021). EAU guidelines recommend mechanical and pharmacologic prophylaxis in open radical and partial nephrectomy (Tikkinen et al., 2022). If these surgical procedures are to be performed robotically or laparoscopically, mechanical prophylaxis remains constant in EAU recommendations, but pharmacologic prophylaxis varies according to the patient's risk (Tikkinen et al., 2022). In our study, VTE and PE did not develop in patients who underwent nephrectomy and partial nephrectomy due to the small number of patients available, considering the low incidences in the literature for these operations.

Limitations and Strengths

One of the limitations of the study is that it was retrospective. Another limitation is that unlike most of the studies in the literature, preoperative single-dose pharmacologic prophylaxis was applied, which limits the comparisons with the literature.

CONCLUSION

Mechanical and pharmacologic methods were applied in VTE prophylaxis, which was determined according to risk status in patients undergoing major urologic surgery. It was found that only 0.8% of patients developed VTE. With this result, it is predicted that the development of VTE can be prevented by risk assessment, selection of appropriate prophylaxis methods, and early mobilization.

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Conflict of Interest

The author declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Author Contributions

Plan, design: PO; **Material, methods and data collection:** PO, SO; **Data analysis and comments:** PO, SO; **Writing and corrections:** PO, SO.

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Effects of Different Doses of Probiotic Supplementation to Diet on Performance, Organ Weight, and Some Blood Parameters in Broilers

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ABSTRACT

Objective: Probiotics are live microorganisms such as bacteria, fungi, or yeast that support the gastrointestinal flora and promote growth performance when administered in sufficient amounts. The current study was conducted to examine the impact of different doses of probiotic mix (*Lactobacillus delbrueckii subsp. bulgaricus, Streptococcus thermophiles, Lactobacillus acidophilus, Lactococcus lactis, Propionibacterium*) on performance, organ weights, and some blood parameters in broilers. **Materials and Methods:** For this aim, a total of 360 two-day-old Ross-308 mixed-sex broiler chickens were randomly divided into five groups, with six replicates containing 12 chicks per replicate. All of them were fed with five different dietary intakes for 40 days as follows: Control (Con; basal diet), Trial I (TI; 0.05% adding probiotics), TII (0.075% adding probiotics), TIII (0.10% adding probiotics), and TIV (0.125% adding probiotics). After the treatments, performance parameters and organ weights were evaluated. Also, blood specimens were collected for sero biochemical analysis. **Results:** Data showed that the highest body weight (BW), average daily weight gain (ADWG), and feed conversion rate (FCR) were determined in the TII group ($p<0.05$). There was no difference in the liver, heart, gizzard, spleen, and intestine weights among the groups. The lowest proventriculus weight was observed in the TII group ($p<0.05$). Probiotic supplementation did not affect the serobiochemical parameters, aspartate aminotransferase (AST), alanine aminotransferase (ALT), triglycerides (TG), glucose (GLU), and total protein (TP) ($p>0.05$). **Conclusion:** 0.075% mixed probiotics could be added to broiler diets to increase growth performance.

Keywords: Blood Parameters, Broiler, Organ Weight, Performance, Probiotic.

Broylerlerde Diyete Farklı Düzeylerde Probiyotik İlavesinin Performans, Organ Ağırlığı ve Bazı Kan Parametreleri Üzerine Etkileri

ÖZ

Amaç: Probiyotikler, yeterli miktarda kullanıldığında gastrointestinal florayı düzenleyen ve büyüme performansını arttıran bakteri, mantar veya maya gibi canlı mikroorganizmalardır. Bu çalışma, farklı düzeylerde probiyotik karışımının (*Lactobacillus delbrueckii subsp. bulgaricus, Streptococcus thermophiles, Lactobacillus acidophilus, Lactococcus lactis, Propionibacterium*) piliçlerde performans, organ ağırlıkları ve bazı kan parametreleri üzerindeki etkisini incelemek amacıyla yapılmıştır. **Gereç ve Yöntem**: Bu amaçla toplam 360 adet iki günlük Ross-308 karışık cinsiyetli etlik piliç, her tekrarda 12 civciv içeren 6 tekrarlı 5 gruba rastgele ayrıldı. Hepsi 40 gün boyunca 5 farklı diyet ile beslendi: Kontrol (Kon; bazal diyet), Deneme I (TI; %0,05 probiyotik katkısı TII (%0,075 probiyotik katkısı), TIII (%0,10 probiyotik katkısı) ve TIV (%0,125 probiyotik katkısı). Çalışma sonunda performans parametreleri ve organ ağırlıkları değerlendirildi. Ayrıca serobiyokimyasal analiz için kan örnekleri toplandı. **Bulgular:** Çalışmada, en yüksek canlı ağırlık (CA), ortalama günlük ağırlık artışı ve yemden yararlanma oranı (YYO) TII grubunda görüldü ($p<0.05$). Gruplar arasında karaciğer, kalp, taşlık, dalak ve bağırsak ağırlıkları açısından fark bulunmadı. En düşük proventrikulus ağırlığı ise TII grubunda gözlendi ($p<0.05$). Probiyotik takviyesi serobiyokimyasal parametreleri, aspartat aminotransferazı (AST), alanin aminotransferazı (ALT), trigliseritleri (TG), glikozu (GLU) ve toplam proteini (TP) etkilemedi ($p>0.05$). **Sonuç:** Büyüme performansını artırmak için piliç rasyonlarına %0,075 oranında karışık probiyotikler eklenebilir.

Anahtar Kelimeler: Kan Parametreleri, Etlik Piliç, Organ Ağırlığı, Performans, Probiyotik.

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INTRODUCTION

The poultry industry has become an essential pillar of national income in many countries worldwide (Tarabees et al., 2019). The world's population is increasing quickly, and it is difficult for people to obtain healthy, cheap food due to drought, climate change, war, and migration (Akhalf et al., 2010). Poultry meat provides a viable option for many low-income families to compensate for the lack of other types of animal protein (Tarabees et al., 2019; Zengin et al., 2022). The poultry industry has recently become one of the most dynamic and ever-expanding sectors worldwide (Akhalf et al., 2010). It must fill the space between the necessity and availability of high-quality protein for human consumption. For people to consume animal foods such as meat, milk, eggs, and fish in sufficient quantities, it is necessary to increase their productivity and the number of animals. For this purpose, different feed additives must be tried to protect animal health, increase their efficiency, and increase the quality of animal foods (Castanon, 2007). Antibiotics have been used as a unique prevention way to fight infections for many years. Overusing antimicrobials as growth promoters in animal feed increased the number of multidrug-resistant pathogens. As a result of this overuse of antimicrobials, animals turned into potential reservoirs of antibiotic resistance genes (Gao et al., 2017; Tarabees et al., 2019). For this reason, many countries around the world have banned the addition of antibiotics to animal feeds. Therefore, the scientific community has started to seek economical and efficient alternatives with high safety margins to replace in feed antimicrobials (Tarabees et al., 2019). Probiotics are non-pathogenic, live microorganisms that, when provided in sufficient quantity, offer a range of health benefits to the host (Tarabees et al., 2019). Probiotics enhance immunity and a healthy equilibrium of bacteria in the gastrointestinal tract, stimulating gut integrity and maturation, enhancing feed intake and digestion by improving the activity of the digestive enzyme and reducing the efficiency of a bacterial enzyme, neutralizing enterotoxins, and enhancing immune function (Kheiri et al., 2018). Because of their useful effects, many probiotics have been used in the poultry industry, containing strains of *Lactobacillus*, *Streptococcus*, *Enterococcus*, *Bacillus*, *Bifidobacterium*, *Aspergillus*, *Candida*, and *Saccharomyces* (Lutful Kabir, 2003). Probiotic supplements have an important influence such as the secretion of antimicrobial agents, competitive adhesion to the mucosa and epithelium, and reinforcement of the intestinal epithelial barrier. For probiotics to be considered functional, bacteria must be an ingredient of the intestinal microflora, be durable to the acid environment, and smoothly adhere to the intestinal epithelium. *Bifidobacterium*, *Lactobacillus*, and yeast are among the most commonly used probiotics in poultry breeding. Besides, *Propionibacteria* strains could be used to improve the health and production of cattle, beef, and pigs (Cousin et al., 2012). The contribution of *Propiobacterium* to poultry health status with combined probiotics has not been fully characterized. The utility of probiotics can be strengthened by various methods, containing strategic strain selection, gene manipulation, and a mix of components that act synergistically (Jha et al., 2020). The most adopted application in modern poultry production is a combinational approach.The effects of probiotics on some blood parameters related to their growth efficiency and carcass weight in broilers have yet to be well known. The current research aimed to examine the effect of the addition of commercial probiotics containing *Lactobacillus delbrueckii subsp. bulgaricus, Streptococcus thermophiles, Lactobacillus acidophilus, Lactococcus lactis, and Propionibacterium* in different doses to broiler feed on performance parameters, organ weights, and some blood parameters.

MATERIALS AND METHODS

Animal material and experimental design

A total of 360 two day-old-broiler chicks (Ross-308) were provided from a hatchery (Karahallılar, Balikesir). The study was conducted from November to December 2022 at Balikesir University Animal Husbandry Application and Research Center. The chickens were randomly allocated into five groups (72 chicks/group) and reared in pens of identical size (1.5 × 1 m) in a deep litter system with a wood shaving floor. Each group had six replicates (12 chicks/pen). Water and feed were provided ad libitum.

Experimental design

Chicks were divided into five dietary treatments as follows:

- Control (Con): Basal diet without probiotic
- Trial I (TI): 0.05 % probiotics to the basal diet
- Trial II (TII): 0.075 % probiotics to the basal diet
- Trial III (TIII): 0.10 % probiotics to the basal diet
- Trial IV (TIV): 0.125 % probiotics to the basal diet

The chicks were fed a basal diet (21.80 % CP, 2990 kcal ME/kg) from 1d to 10d, grower diets from 11 to 20d, and finisher diets from 21 to 40d. Dry matter (DM), crude ash, ether extract, crude protein, and crude cellulose were analyzed according to the guidelines of AOAC, 2000 (5).

The component and analyzed nutrients in the basal diet are represented in Table 1. The mix probiotic consisted of *Lactobacillus delbrueckii subsp. bulgaricus, Streptococcus thermophiles, Lactobacillus acidophilus, Lactococcus lactis, Propionibacterium* (not less than – 2.107 cfu/g) (Zoovit, Plovdiv, Bulgaria).

The experiment lasted for forty days. On the last day of the study, six broiler chickens were randomly chosen from each group, and one chicken from each replicate. After blood specimens were collected from

the jugular vein for biochemical analysis, they were culled by cervical dislocation. Visceral organs (liver, heart, gizzard, proventriculus, spleen, and intestine) were exposed and weighed to determine organ weights.

Table 1. Composition of basal diets (as fed basis, %).

Ingredients (%)	Rations		
	Starter	Grower	Finisher
Corn	60.00	65.00	65.00
Maize DDGS	1.00	1.00	1.00
Soybean meal, 44%	24.30	18.30	17.30
Corn gluten, 62%	7.70	7.70	7.70
Vegetable oil	-	1.00	2.25
Wheat	1.85	1.85	1.60
Barley	1.00	1.00	1.00
Rice bran	0.50	0.50	0.50
Dicalcium phosphate	1.40	1.40	1.40
DL-methionine	0.35	0.35	0.35
L-lysine	0.30	0.30	0.30
Sodium bicarbonate	0.20	0.20	0.20
Calcium carbonate	1.00	1.00	1.00
Salt	0.20	0.20	0.20
Vitamin-mineral *	0.20	0.20	0.20
Total	100.00	100.00	100.00
Nutritional Composition(%)			
Dry matter	89.90	89.60	89.70
Crude protein	21.80	19.50	19.10
Ether extract	2.20	3.16	4.25
Crude ash	5.22	5.20	5.18
Crude cellulose	2.70	2.99	2.98
ME kcal/kg	2990	3117	3202

* Vitamin-Mineral premix supplied per kg; vitamin D3 4,000 IU; vitamin E 70 IU; vitamin A 10,000 IU; Mn 80mg; Fe 30mg; Zn 80 mg; Cu 5 mg; Co 0.5mg; I 1.5mg; Se 0.30 mg. ME:Metabolizable energy.

Biochemical analyses

After taking blood specimens from the jugular vein, they were centrifuged at 3000 g for 10 min, and serum specimens were transferred into clean plastic microtubes and stored at -20°C until analysis. Serum alanine aminotransferase (ALT), aspartate aminotransferase (AST), total protein (TP), glucose (GLU), and triglyceride (TG) were measured by using a biochemical autoanalyzer (Mindray, BS300, Shenzhen, China).

Performance parameters

Chicks and feed were weighed on the 2nd days, 20th, and 40th days of the study. Finally, arranged average daily weight gain (ADWG), average daily feed intake (FI), and feed conversion ratio (FCR) were calculated for each period (2 to 20 days, 21 to 40 days, and 2 to 40 days).

Statistical analysis

The experiment was performed according to the randomized plots experiment plan, with five groups and six replications in each group. Normality tests of the variables were done with the Shapiro-Wilk test. Data were subjected to analysis of variance (ANOVA) with the SPSS 20.0 (SPSS Inc., Chicago, IL) program. Duncan's multiple comparison ($P<0.05$) test was used to specify the differences between the means of the experimental groups (11). $Yij = \mu + Ti + eij$, Yij = observed value of trait i in experimental animals; μ = constant for all groups; Ti = i probiotic effect (i = 1: CON; 2: TI; 3: TII; 4: TIII; 5: TIV) and eij = random error related with the Yij observation.

Ethical considerations

Before the research, ethical approval was required from the Ethical Committee of Balikesir University (Date: 29.09.2022, Approval no: 2022/7–2).

RESULTS

The effects of probiotic mix supplementation on growth performance parameters, such as body weight (BW), average daily weight gain (ADWG), and feed conversion rate (FCR), are presented in Table 2. The body weight of the TII group at 20 d of age was significantly ($p<0.05$) higher than that of the TI, TIII, and TIV groups. On the 40th day age, the highest body weight was seen in TII ($p<0.05$).

The highest average daily weight gain at 20 d of age was observed in the TII group ($p<0.05$). There were no differences in FI between the groups at 2-20, 21-40, and 2-40 days of age. FCR was significantly lower in the TII group according to TIV ($p<0.05$) at 2-40 d of age. There were no differences in FCR on 2-20 d and 21-40 d. The effects of mixed probiotics on carcass weight are presented in Figure 1. The differences between the groups for liver, heart, gizzard, spleen, and intestine weights were not important. ($p>0.05$). However, proventriculus weights in the TIII and TIV groups were higher ($p<0.05$) in the TII group. The blood serum profiles in terms of composition (AST, ALT, TG, GLU, TP) are presented in Figure 2. The experimental trials had no important effects on blood biochemical parameters ($p>0.05$).

Table 2. The growth performance of the groups.

	Treatments Groups					SEM	p
	Con	TI	TII	TIII	TIV		
BW, g							
02. d	67.79	67.79	67.80	67.96	67.96	0.09	NS
20. d	663.44^{ab}	647.93^{b}	695.32^{a}	641.25^{b}	651.67^{b}	5.62	*
40. d	2320.28^{ab}	2286.42^{b}	2414.54^{a}	2282.06^{b}	2356.57^{ab}	17.56	*

Table 2 (Continued). The growth performance of the groups.

	Treatments Groups						
	Con	TI	TII	TIII	TIV	**SEM**	**P**
ADWG, g							
02-20. d	55.20^{ab}	53.24^{b}	57.93^{a}	52.84^{b}	53.71^{ab}	0.66	*
21-40. d	87.20	86.80	90.98	87.69	90.83	0.92	NS
02-40. d	71.20^{ab}	70.02^{b}	74.46^{a}	70.26^{b}	72.27^{ab}	0.61	*
FI, g							
02-20. d	54.50	52.33	56.33	52.00	55.16	0.96	NS
21-40. d	142.21	144.52	142.71	151.37	154.66	2.16	NS
02-40. d	98.36	98.43	99.52	101.69	104.91	1.19	NS
FCR							
02-20. d	0.986	0.983	0.971	0.985	1.026	0.01	NS
21-40. d	1.635	1.671	1.563	1.723	1.710	0.02	NS
02-40. d	1.383^{ab}	1.406^{ab}	1.336^{b}	1.445^{ab}	1.453^{a}	0.01	*

NS: No significant, *: P<0.05. Con: Basal diet without probiotics, TI: Adding 0.05 % probiotics to the basal diet, TII: Adding 0.075 % probiotics to the basal diet, TIII: Adding 0.10 % probiotics to the basal diet, TIV: Adding 0.125 % probiotics to the basal diet. BW: Body weight, ADWG: Average daily weight gain, FI: Feed intake, FCR: Feed conversion ratio.

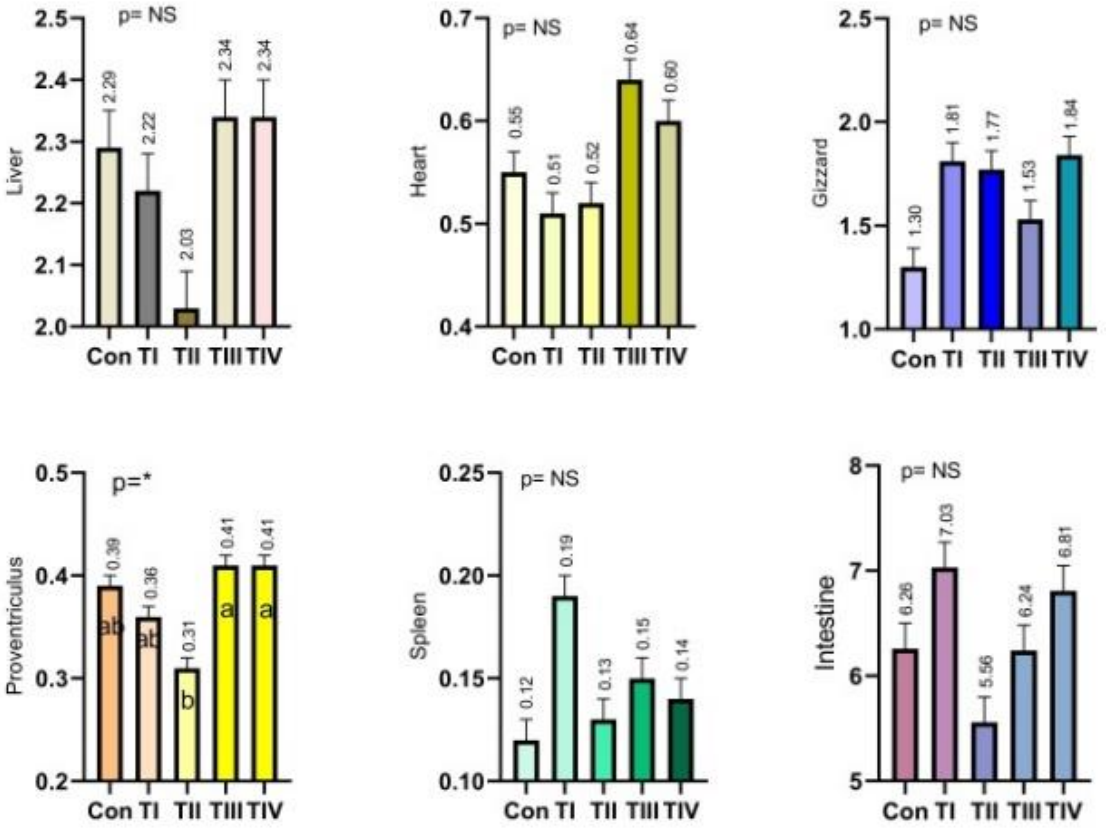

Figure 1. Internal organ weights of the experimental groups (g/100 g body weight).

NS: No significant, *: p<0.05. Con: Basal diet without probiotics, TI: Adding 0.05 % probiotics to the basal diet, TII: Adding 0.075 % probiotics to the basal diet, TIII: Adding 0.10 % probiotics to the basal diet, TIV: Adding 0.125 % probiotics to the basal diet

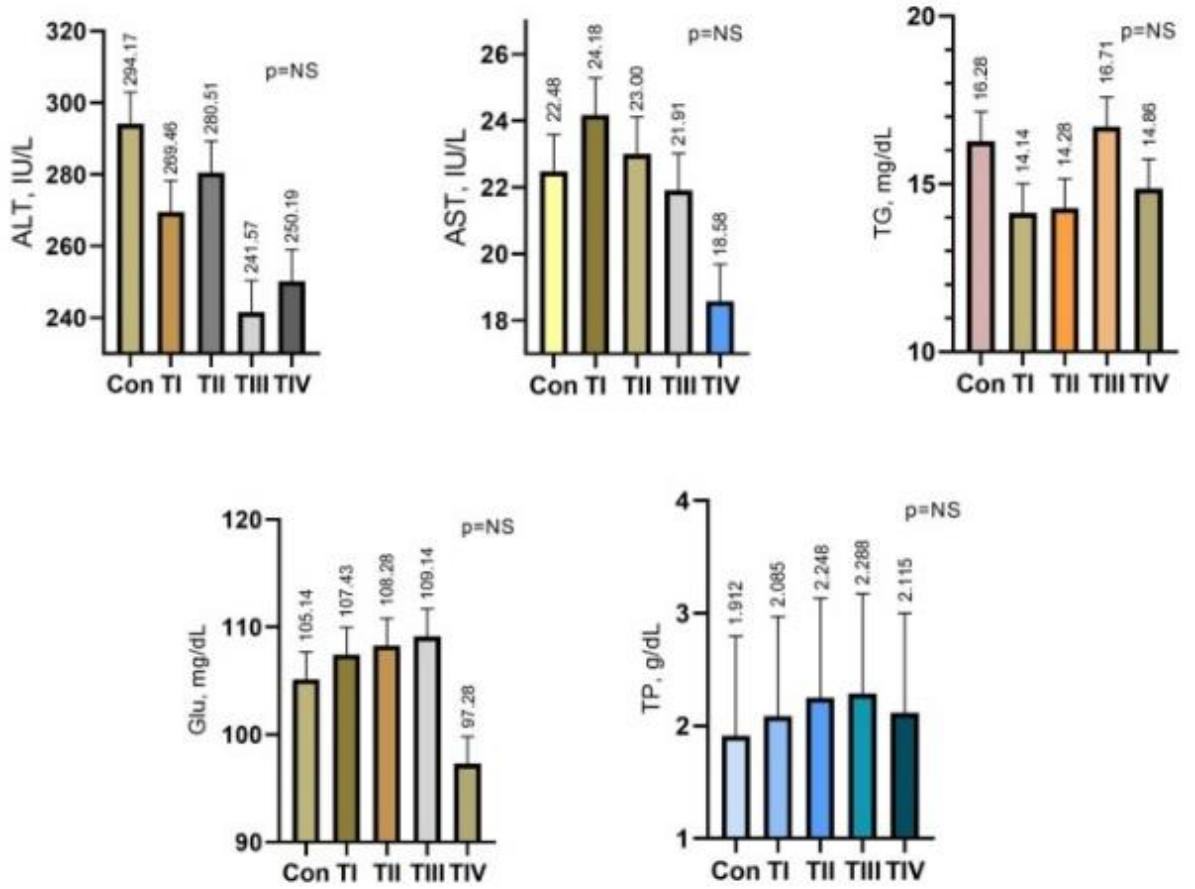

Figure 2. Effects of probiotic on some blood parameters.

NS: No significant, *:p<0.05. Con: Basal diet without probiotics, TI: Adding 0.05 % probiotics to the basal diet, TII: Adding 0.075 % probiotics to the basal diet, TIII: Adding 0.10 % probiotics to the basal diet, TIV: Adding 0.125 % probiotics to the basal diet. ALT: Alanin aminotransferaz; AST: Aspartat aminotransferaz; TG: Triglycerides; GLU: Glucose; TP: Total protein.

DISCUSSION

Recently, researchers have stated that the additive of probiotic species (*Lactobacillus*, *Streptococcus*, *Bacillus*, *Bifidobacterium*, *Enterococcus*, *Aspergillus*, *Candida*, and *Saccharomyces*) in broiler diet has a useful impact on growth performance (GP), intestinal health, immune functions and meat quality (Yazhini et al., 2018). In addition, studies show that improving growth performance and feed efficiency after probiotic addition and probiotics could be an alternative to feed additive antibiotics by protecting against diseases (Ahmat et al., 2021). Advances in GP and FCR of broiler chickens fed probiotics are linked to the total effects of probiotic action containing the maintenance of useful microbial population (Samli et al., 2007). Lactic acid bacteria compete with pathogenic bacteria and inhibit their activity, reducing the breakdown of proteins to nitrogen and reducing dietary protein's effectiveness. Due to this, the use of amino acids and proteins is enhanced (Yazhini et al., 2018). In some studies (Siadati et al., 2017; Yazhini et al., 2018), it was reported that probiotic addition enhanced the plasma protein and increased the GP in quail, but the result of the current research did not concur with these studies. Moreover, Abdel Hafes et al., (2017) showed that the serum total protein concentration of chickens supplemented with probiotics was significantly lower than that of control birds, which concurs with the current study.

The probiotic used from the first day positively affects intestinal microbial balance by ensuring the normalization of the intestinal microflora and protection against pathogenic microbes. Bacteria, part of probiotics, ensure better digestion and absorption of feed (Khabirov et al., 2020). Ahmat et al., (2021) showed that including *Bacillus amyloliquefaciens* LFB112 in broiler diets significantly enhanced the growth performance of broilers. Similarly, Anjum et al., (2005) indicated that the including mixed probiotics in broiler diets positively affects BW and

FCR. Khabirov et al., (2020) recomment the possible advantage of probiotic addition in increasing the growth and quality of broilers.

The current research data indicated that different levels of applying *L. bulgaricus, L. acidophilus, Streptococus thermophilus, L. lactis*, and *Propioni bacterium* did not significantly impact the parameters of GP. However, the GP data indicated that the highest body weight values on the 20th and 40th days were obtained from the TII group, which fed 0.075% supplemented probiotics to the diets. The difference between the groups in terms of FI during the experiment was not important. The lowest FCR was seen in the TII group. Rehman et al., (2020) indicated that no interaction was seen for weight gain at the starter, finisher, and overall phases in their study using probiotics in broilers ($p>0.05$). In general, studies report that the inclusion of probiotics in broiler diets improves GP and resistance to pathogen microorganisms (Hooge et al., 2004; Samli et al., 2007; Jadhav et al., 2018).

The probiotic levels did not affect the relative weights of intestinal tracts of broilers after 40 d of feeding. Huang et al., (2004) reported that the probiotic addition of *Lactobacillus* spp. did not affect organ weights. In the present study, proventriculus weight was the lowest in the TII group and the highest in the TIII and TIV groups ($p<0.05$). Molnar et al., (2011) in their study of adding *B. subtilis* to broiler diets, stated that the liver weight of the group that added probiotics to mixed feeds was lower than the control group, and the groups were similar in terms of spleen weights. Reporting similar results to the data of this study, Hidayat et al., (2016) showed that the inclusion of probiotics in diets did not affect the weight of the heart, liver, and spleen.

Due to various metabolic processes in the body that can be controlled by the liver, AST and ALT are values that can be used to determine hepatic cell damage and healing, as well as the effects of toxic substances on birds. AST is an enzyme involved in protein metabolism. It has many functions, including participation in constructing the cell membrane and synthesizing amino acids. A constant level of AST indicates that the cells are not impaired and are functioning normally. Excessive ALT concentration in serum is known to indicate the development of organ dysfunction and disease progression, and increased ALT levels are associated with liver pathology (Khabirov et al., 2020). In one study, Khabirov et al., (2020) examined the effect of a probiotic Normosil (containing a mixture of living cultures of *Lactobacillus* and *Enterococcus* strains at a concentration of 1×106 and 1×107 CFU/mL) on serum AST and ALT levels. The result showed that AST and ALT levels remained within the physiological limits. According to these data, both enzymes in the serum suggested that "Normosil" had low toxicity in broiler chickens during the growing period. In this study, the experimental treatments had no important effects on AST and ALT values ($p>0.05$), similar to Khabirov et al., (2020).

The cell's important energy source is glucose, which acts as a metabolic substrate. The chicks that were administered probiotic-addition diets indicated a significant increase ($P \leq 0.05$) in their glucose levels (Hussein et al., 2020). Similarly, Khabirov et al., (2020) showed that the addition of probiotic feed additive "Normosil" in the diet of broiler chickens at a concentration of 1×10^6 CFU/mL increased the metabolism of carbohydrates in the body, which was depicted by the increase in the concentration of blood glucose. In the current study, the probiotic mix did not affect the glucose levels ($P>0.05$). Also, treatments containing probiotics have led to a numerical decrease in blood serum cholesterol. Lactobacilli, which have high hydrolytic activity of bile salts, respond to the conjugation of bile salts, and in general, the microorganisms of the digestive system can inhibit the production of cholesterol (Hernández-Gómez et al., 2021). Different data about blood biochemical parameters are reported in the literature, probably due to the different species involved, different probiotic resources, or different levels of probiotics in diets. The fat ingredient of bovine colostrum is high, therefore its utilization in quail diets has enhanced the LDL and TG serum concentrations, as seen in broiler by Arjomand et al. Differently, other authors noticed contradictory data with a decline of LDL serum levels in quails that assumed colostrum with diet (Gorbannejhad Parapary et al., 2021). These could be linked to the probiotic source as well as to the age of the used animals. By making bile salts unpaired, microorganisms reduce their ability to be absorbed in low intestinal ph. As a result, a large part of bile salts is excreted from the body as feces. This process requires the conversion of cholesterol into bile acids in the liver. It decreases the blood serum cholesterol concentration (Sachdev et al., 2021).

CONCLUSION

Inclusion of a probiotic mix (*Lactobacillus delbrueckii subsp. bulgaricus, Streptococcus thermophiles, Lactobacillus acidophilus, Lactococcus lactis, Propionibacterium*) in a broiler's diet could be a useful way to improve the performance. According to our study data, adding 0.075% of mixed probiotics to broiler diets improves chickens' BW and increases their growth performance by improving feed efficiency.

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Conflict of Interest
The author declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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Psychosocial Problems and Coping Methods Experienced by the Nurses Working in Pandemic Clinics

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ABSTRACT

Objective: This study was designed as a descriptive study using the "in-depth interview technique" to determine psychosocial problems and coping methods experienced by nurses working in Covid 19 pandemic clinics. **Materials and Methods**: The universe of the study consisted of 871 nurses working in pandemic clinics of a city hospital in the western part of Turkey between September 2021 and October 2021; and the sample consisted of 21 nurses working in pandemic clinics. "Personal Information Form" and "Psychosocial Health Evaluation Form in Nurses" were used as data collection tools in the study. Data were analyzed by using content analysis. **Results:** Mean age of the nurses participated in the study was 31.85 years old; and 76.20% were women. A total of five main themes and subthemes for each theme were identified at the end of data analysis. Five main themes identified were "Emotional Problems", "Behavioral Problems", "Coping Strategies", "Occupational Changes" and "An Isolated Life". **Conclusion:** Nurses experienced various psychosocial problems in their working environment during the pandemic. It is suggested to plan preventive psychosocial interventions in order to decrease and prevent psychosocial problems experienced by the nurses under challenging conditions.
Keywords: Covid 19, Nurse, Pandemic, Coping Skills.

Pandemi Kliniklerinde Çalışan Hemşirelerin Yaşadıkları Psikososyal Sorunlar ve Başa Çıkma Yöntemleri

ÖZ

Amaç: Bu çalışma, Covid-19 pandemi kliniklerinde çalışan hemşirelerin yaşadıkları psikososyal sorunların ve baş etme yöntemlerinin belirlenmesi amacıyla "derinlemesine görüşme tekniği" nin kullanıldığı tanımlayıcı bir çalışma olarak tasarlanmıştır. **Gereç ve Yöntem:** Araştırmanın evrenini Türkiye'nin batısında bir şehir hastanesi'nde Eylül 2021- Ekim 2021 tarihleri arasında pandemi kliniklerinde çalışan 871 hemşire, örneklemi ise pandemi kliniklerinde çalışan 21 hemşire oluşturmuştur. Çalışmada veri toplama aracı olarak "Kişisel Bilgi Formu" ve "Hemşirelerde Psikososyal Sağlığı Değerlendirme Formu" kullanılmıştır. Veriler, içerik analizi kullanılarak analiz edilmiştir. **Bulgular:** Araştırmaya katılan hemşirelerin yaş ortalaması 31,85 ve %76,20'si kadındır. Verilerin analizi sonucunda toplam beş ana tema ve her bir tema için alt temalar belirlenmiştir. Belirlenen beş ana tema; "duygusal sorunlar", "davranış sorunları", "başa çıkma stratejileri", "mesleki değişiklikler" ve "izole bir yaşam"dır. **Sonuç:** Pandemi döneminde hemşireler çalışma ortamlarında çeşitli psikososyal sorunlar yaşamışlardır. Hemşirelerin zorlu şartlarda psikososyal sorunlarını azaltmak ve önlemek için koruyucu psikososyal müdahalelerin planlanması önerilmektedir.
Anahtar Kelimeler: Covid 19, Hemşire, Pandemi, Başa Çıkma Yöntemleri.

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INTRODUCTION

Covid 19 pandemic has resulted in a big crisis worldwide and caused major psychosocial effects on all people in the world like other pandemics (Otu, Charles & Yaya, 2020). Healthcare professionals play a very impotant role in controlling the pandemics.

While its high mortality and morbidity affect individuals' reactions towards the disease, it puts a great burden especially on healthcare professionals taking on the "savior" role (Haresh & Brown, 2020). Nurses, who are responsible for the treatment and care of the patient, are both exposed to the risk and stress of epidemics at the highest level and try to cope with its psychological consequences for a long time. It has been observed that healthcare workers' anxiety about getting infected and transmitting the infection to their families is more intense than other individuals in the society; and therefore, they avoid contact with their families (Tuncay, Koyuncu, & Ozel, 2020). In addition, nurses have been seen as virus carriers by the society during pandemics from past to present, causing them to feel stigmatized (Bai et al., 2004).

Problems such as increased workload on other nurses when their colleagues contract Covid 19, being assigned to units in which they do not have skills during the pandemic period, diagnosis of their colleagues with Covid 19 and losing their friends, concern that they will have difficulty in accessing personal protective equipment to protect themselves, problems experienced during wearing and using personal protective equipment, facial deformities as a result of wearing masks-glasses-visors, family losses, bed occupancy rates and facing a shortage of medical devices have caused an increase in the stress levels of nurses. These stress factors negatively affect the psychosocial health of nurses (Hicdurmaz, & Uzar-Ozcetin, 2020). WHO pointed out that healthcare workers faced multiple psychosocial hazards during the Covid 19 pandemic such as long working hours and high workload, which can lead to fatigue, sleep disturbance, occupational burnout, increased psychological distress and/or decreased mental health (WHO, 2021).

It has been emphasized that nurses working in Covid 19 clinics experience more anxiety, and the risk of depression is higher especially among intensive care nurses (Wang et al., 2020).

Fernandez et al. (2020) have stated that understanding the psychosocial experiences of front-line nurses and adequately supporting them in this sense are essential to ensure the maintenance of the workforce and high-quality care delivery in a period of increased healthcare need (Fernandez et al., 2020). Additionally, the World Health Organization (WHO) emphasized that protecting mental health of the nurses during the Covid 19 epidemic was a necessity to ensure the long-term capacity of the health workforce (WHO, 2021). Although there are studies on nurses from this perspective, it can be said that they are relatively limited (Hicdurmaz et al., 2020; Ozaydın & Guduk, 2021). Increasing research on the psychosocial effects of the Covid 19 pandemic on nurses will contribute to strengthening the database and planning the necessary interventions for nurses in case of extraordinary situations that will develop from now on.

This study was planned to determine psychosocial problems and coping methods experienced by nurses working in Covid 19 pandemic clinics. In addition, it is thought that conducting the research with in-depth interview method, which is one of the qualitative methods, is valuable in terms of giving nurses the opportunity to share their experiences directly.

MATERIALS AND METHODS

Study type

The aim of the study is to determine psychosocial problems and coping methods experienced by nurses working in Covid 19 pandemic clinics.

This is a descriptive study using "in-depth interview technique", that is one of the qualitative methods. Qualitative methods offer the opportunity to reveal the participants' perspective and subjective experience in an attempt to understand the underlying events and experiences (Sandelowski, 2010).

Study group

The universe of the study consisted of 871 nurses working in pandemic clinics of a city hospital in the western part of Turkey between September 2021 and October 2021. In qualitative research, sample size is determined by the saturation point, which is determined by continuing to collect data until the point where concepts begin to repeat themselves (Boddy, 2016). In this study, the maximum variation sampling method, one of the purposeful sampling methods, was used and the sample size was determined by individual in-depth interviews with nurses until the data started to repeat itself. The study was terminated when data saturation was attained. The research sample included nurses working in pandemic clinics and who were seen to participate in the research. Thus, the sample of the study consisted of 21 nurses working in the hospital during the Covid 19 pandemic.

Procedures

The data of the study were collected using the in-depth interview technique between September 2021 and October 2021. Firstly, participants were informed about the research and they were expected to read and sign the information form. The data of the research were collected by face-to-face interviews with nurses. During face-to-face meetings, care was taken to avoid close contact (i.e., within approximately six feet or two meters) and to use necessary personal protective equipment. The researcher asked the nurses to read the items in the data collection instruments one by one except for demographic data and to answer them. Data collection was carried out for approximately 45 minutes for each nurse. A voice recorder was used to record the interviews. During the interview, the nurses'

facial expressions, body postures and the changes in their emotional and behavioral states were recorded into the interview observation notes.

Data collection instruments

In this current study, *"Personal Information Form"* comprising sociodemographic characteristics and "Psychosocial Health Evaluation Form in Nurses*"* were used as data collection instruments.

Personal information form

The information form which was developed based on the literature consists of 9 questions including the interviewee's age, gender, education level, marital status, economic status, place of residency, family type, disability status, and chronic disease history.

Psychosocial health evaluation form in nurses: In the study, a semi-structured form (Guide Interview Form) prepared by the researchers was used to lead and guide the interview (Elo & Kyngäs, 2008, Wang et al., 2020, Hicdurmaz, & Uzar-Ozcetin, 2020).

The form contains open-ended questions to determine the participants' feelings, thoughts, perceptions and attitudes regarding the research topic.

Some questions in the form are: What are the stressful situations during the pandemic period? How has the pandemic affected your family life? Have you ever been away from your family due to social distance and isolation requirements? What changed in your working conditions during the pandemic period? What are the feelings and thoughts you experience while caring for a patient diagnosed with Covid-19?What are the coping methods you use during the pandemic? For the content validity of the form, opinions were obtained from five experts in the field of psychiatric nursing. The form was finalized in the light of experts' suggestions.

Statistical analysis

The written and verbal data collected for each question asked in the semi-structured questionnaire were transferred to the computer without changing the observation notes kept during the interview. It was checked whether the opinions and notes were suitable for the purpose of the research and it was determined that no opinions were expressed outside the purpose of the research. The data obtained from the in-depth interviews were analyzed by the researcher using content analysis. The following steps were followed in the analysis. First of all, the nurses' statements were transcribed on the computer without changing them with fidelity. In the second step, these statements were read again and again, and those falling into the meaningful category were labeled with a name and (code). Next, the codes obtained from all interviews were cross-examined (with two different researchers) to identify similarities and differences. The codes were grouped based on their content integrity; and themes and subthemes that could represent these codes were created (Elo & Kyngäs, 2008).

Ethical considerations

Before starting the research, written permissions were obtained from the Ministry of Health and the City Hospital. Written approval was obtained from the author's Balikesir University Ethics Committee (Date: 26.05.2021Approval no: 2021/127).

RESULTS

Sociodemographic characteristics of the nurses

23.80% of the nurses participating in the study were male (n = 5), 76.20% were female (n = 16) and their mean age was 31.85 years old (min 23 - max 43). 57.14% (n=12) of the nurses were single, 42.85% (n=9) were married and all of them were university graduates. It was determined that the nurses' working years were mostly between 0-5 years (n=8). Moreover, it was stated that 57.14% of the nurses worked in Covid 19 intensive care units and 42.86% worked in Covid 19 clinics. It was also determined that 33.3% of the nurses lived alone and 66.66% lived with their spouses, children or other family members.

Themes and subthemes

In the analysis of the data obtained from in-depth interviews with nurses, a total of five main themes and their subthemes were identified (Table 1). These themes are included in this section.

Theme 1. emotional problems

This theme included emotional problems experienced by the participating nurses during the pandemic.

Subtheme 1. Anxious suspense

Almost all of the nurses (n=20) expressed their concerns and fears about the future. It has been determined that these anxieties and fears mostly arise from other anxious thoughts about the future such as fear of getting infected by the disease or transmitting it, fear of death, fear of losing loved ones and the uncertainty of the process and uncertainties in the treatment.

"Suddenly finding myself in the Covid 19 intensive care unit caused even more fear for me. My biggest fear was whether I would infect my father. Maybe I'll die too, I don't know. How long will this last, we seem to be in a tunnel with no end" (Participant 1)

Subtheme 2. Living with stress, ıntense sadness and feeling of burnout

The majority of nurses (n: 19) stated that while they felt sad at first, they felt exhausted lately, and approximately half of the nurses (n: 8) stated that they experienced frequent crying spells. It has been determined that situations such as living apart from their families, intense working conditions, having very few resting breaks, encountering death very often, and witnessing their colleagues suffering from Covid 19 disease cause them to experience these feelings.

Some statements belonging to this subtheme are given below.

"The pandemic period took us a long time, we are in a period of almost two years, and

"it gave me a feeling of boredom, fatigue and being stuck in a corner" (Participant 20)

"As I was left alone at home more, I started to cry frequently and experience depression" (Participant 1)

Subtheme 3. Stigmatization

The majority of nurses (n:14) stated that they hid the fact that they were nurses from the social environment. Additionally, some nurses (n:9) stated that people changed their ways when they saw them and felt uneasy while passing in front of their house. Some nurses (n:5) stated that they could not find anyone to care for their child during this period and that they did not want caregivers to enter their homes. It was observed that nurses experienced emotional moments while using these expressions about stigmatization, and some nurses had sad facial expressions while describing those moments.

A statement from this subtheme is as follows:

"People were passing by my house from as far away as they could". I was seeing them from the balcony, they were literally running away from me" (Participant 3)

Many times I witnessed my neighbors talking about me. They forbade their own children to play with my children. My children cried a lot" (Participant 5)

Theme 2. Behavioral problems

In this theme, some behavioral reactions experienced by the interviewed nurses during the pandemic are included. Behavioral reactions of nurses in this process were physical symptoms such as changes in hygiene habits due to fear of transmission of the virus, outward anger, tension, fatigue, some physical pain and sleep problems. In this theme, subthemes such as "change in hygiene habits", "expression of emotions" and "physical symptoms" were generated.

Subtheme 1. Change in hygiene habits

Almost all nurses stated that hygiene practices have increased exaggeratedly although they have decreased recently. In the statements of the nurses, it is seen that their cleaning habits have changed both at work and at home during this difficult period. Some of these habits were wearing layers of masks, staying away from contact as much as possible, desire to have shower constantly, washing food more, washing with vinegar water and gargling.

A statement about the changing hygiene habits of nurses is as follows:

"I cannot leave the hospital without taking a shower twice. In order to go home clean, I come to the hospital with a suitcase, wash myself, put on clean clothes, then go home, wash again and change clothes. I know it is not normal at all, but this is the situation" (Participant 21)

Subtheme 2. Expression of emotions

In this subtheme, the ways in which nurses direct their emotions towards themselves and outside such as anger, rage, tension, helplessness and impatience, were discussed. More than half of the nurses (n:19) stated that they expressed anger reactively as a result of decreased tolerance limits with the prolongation of the pandemic process, and therefore, they entered into some conflicts with themselves, their families and the workplace.

Some of these statements are as follows:

"You become more intolerant. For example, when I go home with that mentality while working at the hospital, I can be more aggressive towards my family and more stressed" (Participant 14)

"Patients generally wanted soup. There were soups they wanted from home and they were intubated and extinguished before they could drink them. That's why I couldn't cook soup at home for a long time" (Participant 12)

Subtheme 3. Physical symptoms

One of the subthemes that emerged at the end of the interviews was the physical symptoms that nurses mostly complained about during the pandemic period. Some of these physical symptoms expressed by the nurses were sleep problems due to the inability to meet basic needs especially at difficult working conditions, physical fatigue, drowsiness due to lack of oxygen under PPE, kidney pain due to drinking less water, back pain due to wearing overalls, recurrent headaches, facial scars due to mask use and etc.

"Our chronic pain also started. Kidney pain, back pain and a constant headache caused by stress. Because there is constant pressure on your nose, pulling it downwards, huge and permanent wounds..." (Participant 1)

Theme 3. An isolated life

All of the nurses (n:21) talked about the reasons and difficulties of their social lives, which were further limited by the nature of their profession. It is seen that situations such as living alone, having to stay in an isolated room at home, losing physical contact with their families, constantly wearing a mask and having to do social activities such as eating alone caused nurses to feel socially isolated.

"For example, I stayed away from my children. They stayed with their grandmother. I didn't see them for 3-4 months, because we were working so hard and because we were afraid. "The first four months were spent alone, we were completely separated and it was very difficult to stay there" (Participant 19)

"I lived alone for months, life was just like a zombie" (Participant 16)

Theme 4. Occupational changes

During the interview, it was observed that all of the nurses (n:21) emphasized the changes in their professional lives. Nurses especially talked about the changes in their working conditions and their feelings about the nursing profession during the pandemic process. It was also observed that they gave different emotional reactions (sometimes sad, sometimes angry tone of voice and facial expression, etc.), especially when describing their feelings about the profession.

"We tried to catch dozens of patients with less number of people. In this intense circulation, procedures also changed. We no longer know what we know. "We worked like wildfire in the first months" (Participant 6)

"So, I question the profession like this: While you support the patient, you suddenly face your own fears. "You can't be good enough, knowing that patients are constantly dying makes you tired" (Participant 1)

Subtheme 1. Changes/challenges in working environment

During the pandemic period, almost all nurses (n:21) stated that the biggest changes occurred in their working environment. Among the changes expressed, there were situations such as having to work without experience in the field (Covid clinics and intensive care units), frequent unit changes, uncertainty of working hours, difficulties working with PPE, short breaks, increase in workload and difficulty in getting used to new procedures.

Some statements are as follows:

"... you come into contact with it every day, you are exposed to difficulties every day, you struggle with everything alone" (Participant 20)

"I had more shifts, I worked a lot more. As I said, I'm very tired. Our working hours have increased a lot. Since we worked in the Covid intensive care unit, of course we had special clothes. It was very difficult to work in overalls. The processes were very long. "Our working hours were very long" (Participant 13)

Subtheme 2: I am alienated with my profession (working like "superman", being invisible like "casper")

Nurses stated that they experienced changes in their feelings about their profession due to the reasons such as changing challenging conditions in their working environments and the prolongation of the pandemic process. Some nurses (n: 2) stated that they wanted to move on to academia, some (n: 3) stated that they hated the profession, some (n: 3) stated that they did not want to see the hospital and patients, and some (n: 7) stated that their profession was worthless.

While only one nurse expressed positive feelings about the profession such as "*feeling heroic*", some nurses stated that they were expected to work like "Superman" and to be invisible like "Casper".

"I didn't want to come here. I don't want to see the hospital, and I still don't. If I had a chance to love my profession, Covid killed my willing to love my profession. I think I hate it. Still, I try to do my job as best I can. I try as hard as I can" (Participant 10)

"This pandemic made me question why I chose nursing in my 21st year. As a person who graduated from university with third place, got a master's degree and is devoted to nursing, I have serious doubts after 21 years. I ask why I am here" (Participant 21)

Theme 5. Coping strategies

In this theme, the coping strategies used by nurses during the pandemic are discussed. As seen in the subthemes, the coping strategies used by nurses vary.

Subtheme 1. Changing focus of attention

It seems that one of the methods used by the nurses in the study to cope with the difficult emotions and thoughts they experienced during the pandemic was to divert their attention. Approximately half of the nurses (n:12) stated to try coping with this process by talking on the phone for long hours, using social media or seeking social relationships during this period; and some nurses (n:12) stated to take up hobbies (gardening, growing flowers and vegetables, yoga/pilates, listening to music, reading books, etc.).

Some statements of the nurses are as follows:

"I exercised during my free time and stayed at home. I often escaped into the nature during the most active and frantic periods of the pandemic. The best thing that I could do at this stage was to step my feet on the ground, release myself into nature and walk" (Participant 21)

Subtheme 2. Spiritual practices

Some nurses (n: 7) stated that they coped with prayer, a fatalistic approach, accepting what comes from God and turning to religious practices during this process.

Some of the relevant statements were:

"...even while praying, I mention Covid from time to time. Normally that is not a word in my vocabulary but I say no one should get Covid, not even my family" (Participant 17)

".... It's more of a belief; in other words, I said it's something that comes from God as per my belief. That's why I motivated myself that way" (Participant 11)

Subtheme 3. Trying to affirm negative thoughts

Approximately one third of the interviewed nurses (n:6) stated that they felt better when they affirmed negative thoughts and judgments about the pandemic. It is noteworthy that they tried to activate positive thoughts by trying to stay away from social media and news about the pandemic, focusing on realistic thoughts about the virus, thinking that the pandemic would end, thinking that the vaccine would be effective, and etc.

Subtheme 4. Receiving professional support for mental health

Only one (n:1) of the nurses included in the interview stated that she received professional support.

"Honestly, I couldn't do much until I got psychological help. I tried to focus on myself a little, but it wasn't enough. I ate my heart out. Then, after getting help, I focused on myself a little bit. Now I've got my life organized" (Participant 10)

Subtheme 5. Re-meaning life

This subtheme is about how nurses' view of life has been affected by this difficult pandemic experience. Approximately half of the nurses (n:14) mentioned that their awareness such as appreciating what they had, being at peace with the current situation, the meaninglessness of getting upset about simple events occurred and that they were able to look at life from a different perspective.

Below are two statements:
"Before the pandemic, I was a little bit more angry, in fact, I was more angry and aggressive. When I saw the desperation of such people with the pandemic, I felt that I could lose my relatives very easily. I can say that I have calmed down a little and changed" (Participant 13)

"So the feeling of enjoying the moment started to become more dominant. Actually, I started to live life more consciously and gratefully" (Participant 2)

Table 1. Themes, subthemes and codes (n=21).

Themes	Subthemes	Codes
Theme 1. Emotional Problems	**Subtheme1.** Anxious suspense	Concerns regarding future Fear of death High death rates Losing acquaintances, fear of transmitting the disease Diagnosis of a colleague with COVID Worrying that the process will never end Uncertainties Thinking that it will be her/his turn one day
	Subtheme Living with stress, ıntense sadness and feeling of burnout	Frequent crying spells Sadness due to living far away from the family, craving Getting worried while thinking about patients continuously Frequently seen deaths in the working department Thinking that they can not heal the patients Inability to give psychological support to the patients Busy work schedule
	Subtheme 3. Stigmatization	Hiding that she/he is a nurse from social environment People changing their ways and moving away Feeling anxiety while passing in front of the house Inability to find someone to look after the children Mobbing from the environment- creating counter isolation
Theme 2. Behavioral Problems	**Subtheme 1.** Change in hygiene habits	A continuous desire to take shower Washing foods more often Wiping door arms and sockets on the walls Frequent use of bleach Using disinfectant Washing with vinegar water Wearing masks in layers
	Subtheme 2. Expression of emotions	Decrease in tolerance against the environment Decrease in patience Questioning why pandemics happened to her/him Feeling angry with herself/himself Outward anger Restlessness Crying spells
	Subtheme 3. Physical symptoms	Sleep problems Physical fatigue Experiencing a drowsiness due to lack of oxygen taken with PPE Feeling herself sick – COVID Kidney pain due to lack of drinking water Back pain due to sweating under PPE overalls Recurrent headaches Chest pain Scars and wounds due to mask use Deformation on facial region

Table 1 (Continue). Themes, subthemes and codes (n=21).

Themes	Subthemes	Codes
Theme 3. An Isolated Life		Living alone Lack of a social environment during the first year of professional life Craving Separate isolation measures at home Interruption of physical contact with the family Moving away from social environment
Theme 4. Occupational Changes	**Subtheme 1.** Changes/challenges in working environment	Extended time spent in COVID field Lack of experience (due to being new to the profession) Starting to turn monthly duty lists into weekly and daily lists Work uncertainties for tomorrow Difficulties in wearing PPE Adapting to new procedures (medications, tests) Increase in the number of patients per person Increase in workload
	Subtheme 2. I I am alienated with my occupation	Desire to transfer to academia Hating the occupation Not wanting to see the hospital and patients Thinking that the profession is worthless Feeling heroic
Theme 5. Coping Strategies	**Subtheme 1.** Changing focus of attention	Spending time on social media Taking up new hobbies Reading books Listening to music, playing a musical instrument Growing plants Exercising, performing pilates Walking in open air
	Subtheme 2. Spiritual practices	Praying Using religious rituals to relax Continuing previous spiritual practices Accepting what comes from God
	Subtheme 3. Trying to affirm negative thoughts	Desire to reawaken previous problems Writing and discarding stressors on paper Dreaming that there is no pandemic Decision not to watch news about the pandemic Moving away from social media
	Subtheme 4. Reveiving professional support for mental health	Receiving professional psychological support
	Subtheme 5. Re-meaning life	Appreciating what you have While you used to worry about simple things previously, you recognize that this is unnecessary currently Finding activities to do at home

DISCUSSION

The data obtained in this study, which was conducted to determine the psychosocial problems and coping methods experienced by nurses working in pandemic clinics, were discussed in line with the literature.

According to the data obtained as a result of the current study, it is seen that one of the most striking themes of nurses working in pandemic clinics is the theme of "emotional problems". It has been determined that almost all of the nurses have concerns and fears about the future such as the fear of contracting the disease and contagion, fear of death, fear of losing loved ones, and the uncertainty of the process and uncertainties in the treatment. In a study conducted by Yigit and Acikgoz (2021) in our country, 617 nurses were attained; and it was found that nurses had high levels of anxiety and fear of

death, and most of them (96.1%) were scared of infecting their families, and the majority (78.4%) were afraid of having themselves infected (Yigit & Acikgoz, 2021). In the same study, it was stated that nurses needed psychological support and nurses with children were affected by the pandemic process. When national and international studies in the literature were examined, it was seen that nurses' anxiety levels were at medium or high levels during the pandemic process (Lai et al., 2020; Bayulgen, Bayulgen, Yesil, & Akcan Turkseven, 2021; Saricam, 2020). In another study conducted in Italy, the risk perception and anxiety rate of healthcare professionals were found to be higher than the general population (Simone & Gnagnarella, 2020). The high contagiousness of the Covid 19 virus and its high mortality rate have caused healthcare professionals to experience more stress and anxiety (Sertoz et al., 2021). In the current study, almost all of the nurses stated that they experienced intense sadness at the beginning of the pandemic process, and approximately half of them experienced crying spells. However, it was observed that this sadness was replaced by a feeling of burnout as the process progressed. When studies in the literature were examined, it was concluded that burnout levels of healthcare workers were high before the Covid 19 period (Willard-Grace et al., 2019; Atkin at al., 2017). With the pandemic, burnout levels in healthcare workers have been evaluated in international studies and the level of burnout has been found to be increased (Denning et al., 2020; Wang et al., 2020). On the other hand, in some studies conducted in our country, the burnout level of healthcare professionals was found to be low (Gunduz Hosgor, Catak Tanyel, Cin, & Bozkurt, 2021). The fact that the pandemic increased along with the progress of our study suggests that the data might be related to the time of obtaining data from nurses and that it might have been coincided with different periods of the pandemic. There is a need to maintain well-being of healthcare professionals in order to effectively manage such pandemic processes and provide care for patients (Sertoz et al., 2021). New studies on nurses across Turkey are needed to reach more definitive results on this subject.

In this study, the majority of nurses stated that they hid the fact that they were nurses from the social environment. In addition, some nurses stated that people changed their ways when they saw them and felt uneasy while passing in front of their house. Moreover, some nurses stated that they could not find someone to care for their child during this period. Studies have shown that nurses are seen as potential virus carriers and are exposed to social exclusion by the society, causing nurses to be stigmatized, marginalized and to experience loneliness (Bana, 2020; Sertoz et al., 2021; Lai et al., 2020; Simone & Gnagnarella, 2020). Preventing nurses from using public transportation, removing them from their apartments and forcing them out of their homes, acts of violence, naming the street where the Covid case was found as "Corona road" are among the stigmatizations, and in many countries including India, the USA and Australia, healthcare workers are beaten, threatened and they have been reported to have been kicked out of their homes (Sakhadeo, 2021; Bagcchi, 2020). It can be thought that this situation was caused by infodemic news in the media about healthcare workers spreading the virus (Bana, 2020). As the number of cases and death rates increased during the epidemic, frontline healthcare workers became more prone to social isolation, stigma and discrimination and were at higher risk of psychological problems. Even worse, it was reported that some healthcare workers working in non-Covid units discriminated their colleagues such as refusing to talk and refusing to eat in the same place (Xiong & Peng, 2020).

In the study, nurses reported to experience sleep problems and backache due to long working hours, drowsiness due to lack of oxygen with long-term use of PPE, kidney pain due to drinking less water, recurrent headaches, fatigue and scarring on the face due to mask use. When the previous studies were examined, it was found that nurses experienced physical symptoms such as muscle pain, sleep problems, tension, aggression and loss of appetite during the pandemic (Haresh & Brown, 2020; Kang, 2020). It is known that the sleep quality of healthcare workers has deteriorated with Covid 19 pandemic due to reasons such as increased workload of healthcare workers, work stress, frequent shifts and fear of infecting their families (Xiong & Peng, 2020). The most common sleep problems experienced are difficulty in falling asleep, decreased sleep duration, disruption in sleep patterns and nightmares (Haresh & Brown, 2020). It is also possible for nurses, who are in constant contact during the pandemic, to experience symptoms such as tension-type headaches, tachycardia, dyspnea, being on guard at all times and feeling like something is going to happen at any moment (Haresh & Brown, 2020). From this perspective, the physical symptoms expressed by the nurses in our study are similar to the literature.

In our study, it was concluded that all nurses were affected by social restrictions, they already lived an isolated life due to their profession and isolated themselves in a separate room due to the fear of infecting their families at home during Covid 19 pandemic. In a qualitative study conducted on healthcare workers including nurses, it was concluded that they isolated themselves even at home due to the fear of infecting their families with the virus, and to prevent this, they did not live in the same environment with their families but stayed in accommodation centers such as guesthouses and hotels during the pandemic (Firat et al., 2021). In addition, in the study by Cini et al. (2021), it was seen

that the society's idea that healthcare workers "spread infection" caused healthcare workers to be separated from society, stigmatized and experienced loneliness (Cini, Erdirenceleni, & Erturk, 2021).

According to the information obtained through the interviews with the nurses in the study, it was concluded that the working environments of the nurses changed during the pandemic period, and there were uncertainties regarding working hours and working frequency. It was stated by the nurses that they mostly had negative emotions and felt worthless during this uncertain working period, some did not want to see patients, some hated the profession and decided to transfer to the academia. At the same time, nurses' stress level increases when they work in environments where isolation measures must be kept at a high level and when they are assigned to areas that require field-specific knowledge and skills such as pandemic clinics and intensive care where they have not worked before or are not accustomed to (Lai et al., 2021). In a study conducted by De los Santos and Labrague (2021), the fear created by Covid 19 pandemic on nurses causes them to perceive job stress more in their working environments, to have a decreased job satisfaction, to experience mental problems, and to have an intense desire to quit job (De los Santos & Labrague, 2021). Psychological problems increase nurses' work stress and negatively affect nurses in the already busy and stressful hospital environment.

Based on the information obtained from the interviews with nurses in the study, it was concluded that nurses used different coping mechanisms when they were asked about their coping strategies during the pandemic process. The Covid 19 pandemic has caused nurses to worry more about their friends and family members, making them more stressed, anxious, and more prone to adopt negative coping strategies (Cui et al., 2019). It has been emphasized that family support is highly valued by nurses during these stressful times of Covid 19 (Cai et al, 2020). During this period, nurses suggested that talking to their loved ones via video chat, receiving social support or receiving individual therapy at least once during their shift might be effective in reducing their stress reactions. Another study reported that nurses used faith-based practices to cope with stress. According to this belief, they believe that the virus is created by a divine power and that it will not harm if God does not want it to be (Munawar &Choudhry, 2021). In our study, it was observed that some nurses used religious rituals such as praying to relax and tried to give a meaning to life again. In another study, it was found that nurses used psychological support as a strategy to cope with stress during the pandemic period (Bana, 2020). In our study, it was observed that only one of the nurses received professional support. Although our study gives similar results to the studies in the literature, psychological support studies in coping strategies appear to be insufficient.

In addition, The International Council of Nurses (ICN) has set the theme for 2020-2022 as "Nurses: A Leading Voice for Future Health Care"(ICN. 2020). In this context, it is very important for nurses to show the necessary sensitivity to improve the working conditions, physical and mental health of nurses.

Limitations and Strengths

The results of the study are limited only to the nurses included in the sample. In addition, the facts that nurses working in the institution worked in 24-hour shifts during the research, data could not be collected during working hours so as not to disrupt patient care and nurses did not want to spend longer periods of time in the hospital outside working hours, could be considered as a limitation of the research.

CONCLUSION

As a result of the assessment of data, a total of five main themes and subthemes for each theme were determined. It was observed that nurses had emotional and behavioral reactions during the pandemic process and they experienced physical health problems, difficulties at professional work and changes in their perception of the profession. In addition, they often applied to spiritual practices and practices aiding to give a meaning to life again to cope with these difficulties. It is recommended to create intervention programs to reduce nurses' psychosocial problems that may arise in difficult situations and to increase their psychological resilience.

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Conflict of Interest

There is no conflict of interest between the authors.

Author Contributions

Plan, design: EGD; **Material, methods and data collection:** EGD, KS; **Data analysis and comments:** AK; **Writing and corrections:** EGD, AK.

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A Qualitative Study on the Experiences of Volunteer Nurses about After the Elbistan Earthquake

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ABSTRACT

Objective: This study was carried out to examine the experiences of nurses working voluntarily in the field after the Elbistan earthquake. **Materials and Methods:** This study was carried out in a phenomenological design by using the qualitative research method. The sample of the study was determined by snowball sampling, one of the purposeful sampling methods, and the study was carried out with 16 nurses who accepted to participate in the study and met the inclusion criteria. The data were collected face to face between April 3 and July 30, 2023 by individual in-depth interview method and a semi-structured interview form was used as a data collection tool. **Results:** This study, nurses stated that they felt emotions such as "anxiety, fear, stress, sadness, restlessness, desire to take action, trauma, uneasiness, helplessness, anxiety, guilt" after receiving the news of the earthquake. The difficulties experienced by nurses were "lack of disaster nursing experience, uncertainty about the condition of the field, concern for safety, challenging psychological environment, concern for competence, fear of making mistakes, concern for harm, bodies with damaged integrity, seeing too many deaths." **Conclusion:** The obtained experiences highlight that disaster nursing should encompass management, organization, coordination, teamwork, and crisis management skills, along with disaster-specific nursing care. Nurses need to be better equipped for disaster nursing.
Keywords: Disaster, Disaster Nursing, Earthquake, Nursing Care.

Elbistan Depremi Sonrası Sahada Gönüllü Çalışan Hemşirelerin Deneyimleri Üzerine Nitel Bir Çalışma

ÖZ

Amaç: Bu çalışma Elbistan depremi sonrasında sahada gönüllü olarak çalışan hemşirelerin deneyimlerinin incelenmesi amacıyla gerçekleştirilmiştir. **Gereç ve Yöntem:** Bu çalışma nitel araştırma yönteminden yararlanarak, fenomenolojik desende gerçekleştirilmiştir. Araştırmanın örneklemi amaçlı örnekleme yöntemlerinden kartopu örnekleme ile belirlenmiş, çalışmaya katılmayı kabul eden ve çalışmaya dahil edilme kriterlerini karşılayan 16 hemşire ile çalışma gerçekleştirilmiştir. Veriler bireysel derinlemesine görüşme yöntemi ile 3 Nisan 2023-30 Temmuz 2023 tarihleri arasında yüz yüze toplanmış ve veri toplama aracı olarak yarı yapılandırılmış görüşme formu kullanılmıştır. **Bulgular:** Çalışmamızda hemşireler deprem haberini aldıktan sonra "endişe, korku, stres, üzüntü, huzursuzluk, harekete geçme arzusu, şaşkınlık, tedirginlik, çaresizlik, anksiyete, suçluluk" gibi duyguları hissettiklerini ifade etmişlerdir. Hemşirelerin yaşadıkları zorluklar "afet hemşireliği tecrübesinin bulunmaması, sahanın durumuyla ilgili belirsizlikler, güvenlik endişesi, zorlayıcı psikolojik ortam, yeterlilik endişesi, hata yapma korkusu, zarar verme endişesi, bütünlüğü bozulmuş bedenler, çok fazla sayıda ölüm görme" olmuştur. **Sonuç:** Elde edilen deneyimler, afet hemşireliğinin afete özgü hemşirelik bakımının yanı sıra yönetim, organizasyon, koordinasyon, takım çalışması ve kriz yönetimi becerilerini de içermesi gerektiğini vurgulamaktadır. Hemşireler afet hemşireliği konusunda daha donanımlı olmaya ihtiyaç duymaktadır.
Anahtar Kelimeler: Afet, Afet Hemşireliği, Deprem, Hemşirelik Bakımı.

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INTRODUCTION

In contemporary times, disasters, whether derived from human activities or natural occurrences, represent a grave concern, frequently affecting a significant number of individuals both globally and within our nation. These calamities not only precipitate emergency situations but also disrupt the natural flow of life, altering living conditions and negatively impacting individuals in various aspects (Şimşek & Gündüz, 2021; Grochtdreis et al., 2017). Amid the altered living conditions, addressing health needs emerging from the destruction caused by the disaster, and ensuring the continuity of health services uninterruptedly, are indeed paramount necessities. Ensuring the sustainability of health services, emergency intervention, and the rehabilitation process in the aftermath of a disaster necessitates that nurses possess specialized knowledge, skills, and experiences in disaster nursing in order to secure the intended benefits.

The systematic and regular application of professional knowledge and skills by nurses while conducting activities with other professional groups to mitigate the physical and psychological risks of disasters has brought forth the concept of "disaster nursing" (Brewer et al., 2020; Chapman & Arbon, 2008). Research indicates that the presence of nurses in disaster response reduces fatalities, and that nurses demonstrate greater flexibility and proficiency in emergency situations, as well as success in team endeavors (Brewer et al., 2020; Şimşek & Gündüz, 2021). Additionally, nurses are reported to frequently assume team leadership roles during disasters (Zarea, 2014).

The complexity of modern-day disasters demands health professionals who can operate at every phase of the disaster process. Recent disasters have revealed that a lack of knowledge regarding intervention and management leads to confusion among responders and delays in assistance responses (Özmen & Özden, 2013). For this reason, nurses' leadership is very important in managing the disaster process.

Engaging in disaster processes must evolve from a voluntary act to a professional obligation. Foremost for professionalism is the necessity for comprehensive education. The World Health Organization (WHO) recommends that all countries ensure health professionals are trained to respond to all disasters at a level that is appropriate to both national and local disasters, regardless of the frequency with which they encounter such catastrophes, due to the increasing incidence of disasters (WHO, 2009).

Nurses, as significant contributors to the healthcare service workforce in disaster management teams, and as stakeholders at every stage of the disaster cycle, have responsibilities towards the community they live in and the institution they serve, to protect human health at all stages of disaster management (pre-disaster, during, and post-disaster). Regardless of their area of specialization (clinician, educator, researcher, administrator), all nurses must possess the ability to plan and execute disaster care. The International Council of Nurses (ICN) has emphasized that disaster preparedness and response should be a part of nurses' knowledge and skills. All nurses should possess basic competencies to prepare for disasters, protect from disasters, and utilize their knowledge and skills during and after a disaster (Loke & Fung, 2014).

In Turkey, on Monday, February 6, 2023, a large-scale and intense earthquake occurred, firstly in Pazarcık of Kahramanmaraş, and secondly in the Elbistan district, affecting numerous provinces. This study has been conducted with the aim of identifying the experiences of volunteer nurses working and to contribute to the field of nursing in the field after the earthquake in Elbistan.

MATERIALS AND METHODS

Study type

This study was conducted utilizing qualitative research methodology, specifically in a phenomenological design.

Research questions

What are the experiences of nurses before going to the earthquake zone?

What are the field experiences of nurses who volunteered in the aftermath of the earthquake?

What are their experiences in the process after leaving the field?

Population and sample of the research

The universe of the research consists of nurses who voluntarily came to serve in the emergency service unit of Elbistan State Hospital in the post-earthquake period and worked for at least 5 days. The sample of the research was determined by snowball sampling, one of the purposive sampling methods, and the study was conducted with 16 nurses who agreed to participate and met the inclusion criteria. The inclusion of new participants was terminated upon reaching data saturation, indicated by the absence of new information and repetition of data.

Inclusion criteria

Participants (nurses) must have worked voluntarily in the field for at least 5 days post-earthquake.

Participants must not have a communication impediment.

Participants' native language must be Turkish.

Exclusion criteria

Participants have a work duration less than 5 days.

Participants having communication barriers.

Participants having a native language other than Turkish.

Data collection tools

A semi-structured interview form was used for data collection, providing participants with autonomy, thus enabling the acquisition of more data. The interview form contains 5 questions about participants' sociodemographic information, and a total of 17

questions regarding experiences before, during, and after volunteering post-earthquake. Interview questions were arranged after a literature review and obtaining the opinions of 3 distinct experts. A pilot study was conducted with 2 volunteer nurses using the semi-structured interview form, during which some word corrections were made in the questions.

Data collection

Data were collected face-to-face using the individual in-depth interview method between 03.04.2023-30.07.2023 utilizing the semi-structured interview form as a data collection tool. The interviews, approximately 30 minutes each, were conducted according to a work calendar, structured based on the participants' availability and preferred locations. Interviews were conducted in two steps to build trust: an initial meeting for general conversation and acquaintance, followed by the research-related semi-structured interview. To prevent data loss, both immediate notes and audio recordings were taken during data collection. Two researchers involved in the study participated in both the data collection phase and subsequent stages (transcription of audio recordings, creating codes and themes, description-interpretation, analysis).

Data analysis

In the analysis of the data, the data collected with the voice recording and instant notes were transferred to a text file, followed by the formation of themes and codes from this text to conduct the analysis.

Validity and reliability

To enhance the validity of the research, participant verification method was used (Lincoln & Guba, 1985). In participant verification, transcripts containing participant's views were read and approved by the participants. To ensure external validity, inclusion of detailed participant introductions (Braun & Clarke, 2013) utilization of purposive sampling method, and specification of inclusion and exclusion criteria (Başkale, 2016) were emphasized. Within this context, a detailed introduction of the participants is shown in Table.1, the purposive sampling method was used, and inclusion-exclusion criteria were specified.

Ethical considerations

Prior to commencing the research, ethical approval was obtained from the local ethics committee (Date: 27.03.2023, Approval no: E-64577500-050.99-44185). Informed consents were obtained from the participants.

RESULTS

The results derived from the research are reported under four headings: sociodemographic data, data related to the process before going to the field after the earthquake, data related to the process of volunteering in the field, and data related to the process after leaving the field. The study was completed with 16 nurses, and the names of the nurses have been anonymized and coded as N1, N2…N16.

1. Sociodemographic data of the participants

The ages of the nurses participating in our study range from 23-45, and their nursing experiences are distributed between 2-23 years. It has been determined that the nurses worked in the National Medical Rescue Team (NMRT), operating room, neurology, intensive care, cardiology, pediatrics, dialysis, surgery, emergency, internal medicine and administrative units. The distribution of the nurses' sociodemographic features is shown in Table 1.

2. Data related to the process before going to the field after the earthquake

Based on the data obtained from interviews with the nurses after the earthquake, two themes have been identified through the experiences gained by the nurses: "emotions felt" and "deciding to volunteer".

Theme 1. Emotions felt

Nurses expressed that after hearing the news of the earthquake and learning about its magnitude and impact, they felt emotions such as “worry, fear, stress, sorrow, unrest, desire to act, astonishment, nervousness, helplessness, anxiety, guilt”. Some exemplary statements regarding the emotions felt by the nurses are as follows:

N1: “Upon learning about the earthquake, I initially thought it was limited to a city or a smaller region. When I followed the media news, I saw that the destruction was immense. My family was in the earthquake region, and I was extremely worried for them. I experienced intense fear and stress.”

N2: “I wanted to contribute and practice my profession, or help in other ways, but I could not set out on the journey, especially on the first day due to transportation issues. Therefore, in the ensuing twenty-four hours, I felt guilty because I knew the benefits my profession could provide but was internally distressed about not being able to be there at that moment.”

N6: “I had fear, helplessness, and significant anxiety. I wanted to do something but did not know what to do or how to do it. I was afraid of being unable to do anything even if I went.”

Theme 2. Deciding to volunteer

Nurses declared that they decided to go to the earthquake region and work voluntarily in the field due to issues such as “Organizations in communication channels, being experienced in emergencies, being fast and practical, having developed application skills, being clinically experienced, the presence of a large number of people affected by the earthquake, international calls for help, and disaster victim nurses working in the field”. Examples of statements related to nurses' decision-making processes are below.

N1: “When I saw the crowds of health teams waiting to enter our country to help at the airports, I could not believe my eyes. I thought, as a nurse serving this country, I must be in the field and work. If I hadn’t gone to the field, I couldn’t continue my daily life and would have felt much worse.”

N5: “I thought I absolutely had to be in the field to find spiritual peace. Because I can touch a person, be useful to a person, or save people's lives. I decided to go to the field, acting with the sense of responsibility imbued in me by my profession.”

Table 1. The distribution of the nurses' sociodemographic features.

Nickname	Age	Sex	Education	Nursing Experience	Units served
N1	31	Female	University Graduates	7 years	Pediatrics, Emergency
N2	23	Male	University Graduates	2 years	Emergency
N3	39	Male	Master degree	13 years	Operating Room, Neurology, Intensive Care, Cardiology
N4	30	Male	Master degree	4 years	Operating Room, Neurology, Intensive Care
N5	33	Male	University Graduates	11 years	NMRT, Emergency
N6	45	Female	Doctorate degree	23 years	Intensive Care, Administrative
N7	27	Female	University Graduates	6 years	Emergency, Dialysis, Internal medicine
N8	32	Female	University Graduates	8 years	Pediatrics, Emergency, Internal medicine
N9	43	Female	University Graduates	20 years	Pediatrics, Surgery, Administrative
N10	42	Male	University Graduates	20 years	Emergency, NMRT
N11	26	Female	University Graduates	3 years	Emergency
N12	28	Female	University Graduates	5 years	Emergency
N13	31	Male	University Graduates	6 years	Intensive Care
N14	27	Female	University Graduates	4 years	Emergency
N15	32	Female	University Graduates	5 years	Emergency
N16	43	Female	University Graduates	10 years	Neurology, Intensive Care

N9: “When I saw on the media that the earthquake affected 11 provinces and that international help was being requested, I immediately packed my bag. I wanted to keep myself ready both psychologically and physically as if I would hit the road at any moment; my profession, nursing, would require this anyway.”

N10: “I have been nursing in the emergency room for a long time, and I also have NMRT experience. I knew I was quite fast and practical in emergency interventions. When I saw that the earthquake affected many places, I wanted to volunteer directly. I knew I could save people's lives by using my knowledge, experience, and skills, these thoughts influenced my decision.”

3. Data pertaining to the volunteer work period on the field

The data derived from the experiences of nurses during the process of their voluntary fieldwork have formed themes of "initial impressions, disaster-affected nurses, patients cared for, and challenges encountered."

Theme 1. Initial impressions

Upon reaching the earthquake-stricken area, the nurses articulated their initial impressions as "collapsed buildings, traffic, people attempting to provide help, cold, darkness, roads blocked by debris, and people abandoning the city." Illustrative statements related to initial impressions are exemplified below.

N3: "When I first entered the city, all the buildings within sight were demolished, and those that appeared standing were sunk at least 1-2 floors into the ground.

Most buildings were unusable. People were waiting by the debris in the cold. The weather was frigid. It was unbearable to stay outside under normal circumstances, but people were waiting in desperation."

N12: "There was heavy vehicle traffic trying to enter the city to provide aid. On the other side, there was a long queue of vehicles departing from the city. What I witnessed deeply affected me. Life seemed to have halted."

N7: "Most of the buildings were destroyed; those that were not were unusable; roads were blocked by debris; getting from one place to another took a very long time; the weather was incredibly cold."

N13: "While heavy vehicle traffic was delivering aid on the one hand, on the other, people were leaving the city in droves. The abandonment of the city saddened me the most. At that moment, I thought it would be a long time before this city could return to its former state. Thinking about the people who needed help was very distressing."

Theme 2. Disaster-affected nurses

Volunteer nurses indicated that their colleagues worked under extremely difficult conditions and the fact that the nurses were "disaster-affected" themselves was overlooked. It was expressed that disaster-affected nurses "had been working almost non-stop for approximately 48-72 hours, could not rest sufficiently, were unable to meet their hygiene needs, experienced issues accessing food and water, continuously received bad news and learned about their losses, were psychologically worn, were worried about the safety of their loved ones, experienced fear and burnout, were anxious about the future, and found it hard to continue working." Example sentences related to the status of the volunteer nurses are as follows:

N4: "My colleagues in Elbistan, who were victims of the earthquake, were working on their 3rd day post-earthquake when I reached the field. They had worked almost non-stop, were unable to find hot water and hygiene supplies to meet their hygiene needs. They experienced problems accessing food and water. On the other hand, they continuously received bad news/death news about their friends and loved ones and had to keep working."

N6: "All the nurses seemed very scared, worn, and exhausted; they said they went to the hospital just about five minutes after the earthquake, and for a long time, they couldn't hear from their friends and relatives, their minds were very occupied, yet they didn't stop to rest even for a moment in order to be of help."

N8: "The weather was very cold; most didn't have uniforms, shoes, or jackets. They had come to the hospital in the clothes they were wearing during the earthquake, having lost everything. Their initial needs were in the order of secure space, ensuring the safety of their loved ones, and then physical needs."

N9: "Nurses were hugging each other, crying in a corner, then wiping their tears and coming to attend to their patients. We experienced very emotional moments; it's really hard to describe."

Theme 3. Patients under care

During the period wherein nurses voluntarily rendered their services on the field, they provided care to individuals extricated from the rubble or to the team operating on the site. Clinical characteristics that emerged within the on-site team have been delineated as "nausea, vomiting, diarrhea, common cold, injuries, fever, voice hoarseness, frostbite, and psychological trauma." The clinical features of patients rescued from the rubble were listed as "hypothermia, crushing injuries, edema, fractures, semi-conscious state, open wounds, psychological trauma, respiratory difficulty, disorientation, dehydration, hypoglycemia, anuria, limb amputation, internal bleeding, and Crush syndrome."

Nursing interventions implemented in the care of patients extracted from the debris were enumerated as "establishing and maintaining communication with the patient, informing the patient about their condition, providing psychological support, administering fluid therapy, placing a bladder catheter, monitoring urine output, using heaters and blankets to elevate body temperature, taking samples for blood tests, wound care, physical examination, cardiopulmonary resuscitation, administering oxygen therapy, ensuring the monitoring of vital signs, meeting hygiene requirements, providing appropriate positioning, and monitoring input and output."

Theme 4. Encountered challenges

The challenges encountered by the nurses included "lack of disaster nursing experience, uncertainties related to the field conditions, security concerns, a demanding psychological environment, concerns about proficiency, fear of making mistakes, anxiety about causing harm, dealing with mutilated bodies, witnessing numerous deaths, and impairment in thinking and decision-making processes." Below are exemplified situations in which the nurses found difficulty.

N14: "The fact that I had never practiced disaster nursing before and that I didn't have direct training on the subject frightened me. Of course, we learned many interventions during our undergraduate education and have experiences from our working environment, but a disaster is different. Seeing limbs severed, bodies crushed and mutilated, especially being sensitive about pediatric patients, challenged me."

N15: "I have worked in disaster areas before; perhaps I was anxious about what I would encounter because I was familiar with the disaster environment. I worked during fires and floods. I particularly struggled with interventions related to children; my eyes often filled with tears because I have my own child, and they constantly flashed before my eyes."

N7: "I experienced thoughts like how I could digest what I would see, how much I would be affected, and how I would cope. Some of the patients I saw lingered in front of my eyes. Nevertheless, considering my purpose no matter what, I tried to prepare myself for what would happen."

N8: "Having no experience in disaster nursing previously psychologically challenged me. Because we, nurses, do not engage in something we are not sure about; we cannot undertake an intervention that will harm the patient. The unknowns and safety hazards—contemplating these were professionally difficult."
N9: "Throughout my professional life, I had not seen so many deaths in such a short time; the hospital morgue was full, and there were continuous queues of bodies forming in the hospital garden. People were waiting for autopsy procedures. This was what challenged me the most."
N4: "There were moments when we could not think and make decisions. It was as if our ability to think and make decisions was frozen. Sometimes we couldn't even speak."

4. Data concerning the period following departure from the field

A theme of "adaptation to daily life" has been formulated through the experiences narrated by nurses upon their return to their daily lives after leaving the field.

Theme 1. Adaptation to daily life

After leaving the field, nurses have expressed their experiences related to adapting back to daily life. They have stated "thinking about the earthquake zone, blaming themselves, contemplating staying longer, feeling insufficient, struggling with engaging in entertainment and social activities, continuously following news about the region, and changes in sleep patterns." Examples of the nurses' expressions are as follows:

N3: "Upon returning home and observing my city, everything being in its place and people continuing their normal lives seemed very strange to me. Sometimes, when I was in a building, I found myself thinking about how it stays upright and how life goes on."
N5: "After coming from the earthquake zone, I began sleeping for periods exceeding 10 hours. There were people, including my family and close ones, who wanted to see and talk to me, but I didn't want to meet anyone. Approximately 15 days passed like this, and I experienced crying fits. I questioned the purpose of life."
N16: "I felt feelings of inadequacy thinking that I should have helped more people. My mind stayed with my colleagues in Elbistan. I closely followed what was happening in that region for a long time."
N8: "It was as if there were more things I should have done but couldn't; I felt inadequate. I couldn't get out of its impact for a week. I continuously blamed myself, thinking I wish I could have gone there and done this and that. I struggled to participate in social activities and entertainment environments; I always felt guilty."

DISCUSSION

Disasters, through the transformative impacts they generate, affect societies in the short, medium, and long term. Post-disaster losses can foster various adverse effects on survivors (Wang et al., 2020). Studies have reported that the traumatic situations emerging from these events can result in fear, guilt, anger, despair, anxiety, hopelessness, and mental distress (Altuntaş et al., 2023; Düzgün et al., 2023; Harmanci Seren, & Dikeç, 2023; Wang et al., 2020). Our study also revealed that nurses experienced emotions such as anxiety, fear, stress, sorrow, unrest, the urge to act, confusion, apprehension, despair, anxiety, and guilt after the earthquake. It is plausible to suggest that the emotional responses of the nurses post-earthquake are in line with the literature.

The existence of nursing originates from the point of aiding individuals (Coatsworth et al., 2017). The altruistic approach, associated with helping, denotes the nurse's willingness to prioritize the needs of others over their own, acting predominantly to meet the needs of others (Batson et al., 1991; Twemlow, 2001; Valsala & Menon, 2023). Our study similarly suggests that the nurses exhibited an altruistic approach. Nurses have decided to go to the earthquake region and voluntarily work on the field, motivated by factors like international teams going to the earthquake region, calls for international aid, being clinically experienced, and the presence of disaster-affected nurses working in the earthquake region. This approach of the nurses implies a thoughtful and selfless perspective.

The Turkish Nurses Association announced that nurses working in the area should be granted administrative leave following the earthquake (TNA, 2023). However, the disaster-affected nurses in the region continued to work, attending to patients and their relatives. Literature reveals studies showcasing that disaster-affected nurses worked long hours in the post-disaster period, encountering fatigue due to lack of rest, experiencing scattered attention and psychological impacts, and facing difficulties in meeting their needs (Altuntaş et al., 2023; Banerji & Singh, 2013; Bektaş Akpınar & Aşkın Ceran, 2020; Dixit et al., 2023; Labrague et al., 2018; Nakayama et al., 2019). In our study, volunteer nurses also voiced that disaster-affected nurses in the earthquake region experienced similar issues and continuously received distressing news about losses, experienced fear and burnout, had anxieties about the future, and struggled with working.

Post-earthquake issues faced by patients can be categorized as renal damage, musculoskeletal injuries, chest injuries, neurological problems, mental issues, infectious diseases, and hematological problems (Bartels & VanRooyen, 2012; Hu et al., 2022; Sever et al., 2002). Our study also reported that volunteer teams mainly encountered infectious diseases on the field, while patients rescued from the rubble manifested renal function impairments and injuries. The clinical characteristics of the post-earthquake patients appear to align with the clinical situations classified in the literature.

Nurses, who might assume roles such as rescue, care, education, counseling, and management in the post-disaster process, need to be fully trained and prepared in disaster management (Taşkıran & Baykal, 2019). Real-life experiences are crucial for nurses to learn and draw conclusions in these training (Harmanci Seren & Dikeç, 2023). Studies investigating the readiness of nurses in disasters reveal that nurses do not feel prepared, adequate, or confident against disasters (Altuntaş et al., 2023; Banerji & Singh, 2013; Labrague et al., 2018; Putra et al., 2020). Additionally, it is reported that nurses face professional difficulties in the post-disaster period (Altuntaş et al., 2023; Banerji & Singh, 2013; Labrague et al., 2018; Putra et al., 2020). In our study, volunteer nurses conveyed that they experienced lack of experience, uncertainty, safety concerns, fear of making mistakes and causing harm, witnessing a large number of deaths, and disruptions in thought and decision-making processes while working on the field. These challenges for the nurses may arise due to working in an extraordinary environment.

Nurses might experience a range of adaptation problems when they return to their normal lives after disasters, and some psychological and physical effects might persist even years after the event (Bektaş Akpınar & Aşkın Ceran, 2020; Nukui et al., 2018). It is reported that due to the disaster nursing experience, differences might arise in nurses' world views, prompting questioning about the meaning and purpose of life (Altuntaş et al., 2023; Janoff-Bulman, 1992). In our study, volunteer nurses expressed difficulties in adjusting back to normal life, and conveyed feelings of unrest due to leaving the disaster area, feelings of inadequacy, the desire to help more people, curiosity about those in the region, and a desire to follow the news. This situation may stem from the inability to swiftly alleviate the effects of the disaster and from its consequences, which continue to impact thousands of individuals.

Limitations

This study is the first to examine the field experience of volunteer nurses after the Elbistan earthquake. Our study was conducted with nurses who worked voluntarily in a single district hospital in the post-earthquake period. The findings obtained through the field experiences of volunteer nurses can be improved by adding nurses from different regions to the sample group.

CONCLUSION

Following the Elbistan earthquake, nurses who voluntarily worked in the field experienced emotions that prompted them to volunteer even before heading to the area, being driven to assist as part of the nursing profession's mandate. It has been determined that the volunteer nurses garnered significant experiences during their fieldwork and encountered various professional challenges.

The obtained experiences highlight that disaster nursing should encompass management, organization, coordination, teamwork, and crisis management skills, along with disaster-specific nursing care. Therefore, to strengthen and develop disaster nursing, it is recommended to conduct mentorship, implement learning-based studies on life experiences, gain experience through case studies, organize disaster-specific training, establish disaster teams and conduct drills, follow up-to-date approaches, embed disaster nursing education within undergraduate education, enhance psychological approaches and communication skills during the disaster period, and facilitate foreign language learning.

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Conflict of Interest

The author declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Author Contributions

Plan, design: AYİ; **Material, methods and data collection:** AYİ, EZMG; **Data analysis and comments:** AYİ, EZMG; **Writing and corrections:** AY, EZMG.

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Ethical Approval

Institution: Cappadocia University Non-Interventional Clinical Ethics Committee
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Evaluation of Burnout, Anger Management and Job Stress in Medical Residencies Working in and Outside the Operating Room

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ABSTRACT

Objective: The aim of the study is to compare job stress, burnout and anger management in surgical (in the operating room) and internal medicine residencies, and also to evaluate whether there is a relationship between burnout, anger management and job stress. **Materials and Methods:** Following ethics committee approval, surgical and internal medicine residencies were asked to fill out an online survey regarding job stress, Copenhagen burnout scale, and anger management. **Results:** The burnout level according to the cutoff value for a total of 139 residencies (surgery, n=74 and internal medicine, n=65) was 73%, and also higher prevalence was observed in surgical residencies than in internal medicine residencies (77% and 68%, p=0.01). It was determined that total and work-related burnout, trait anger and job stress scales were significantly higher in the surgical group. When burnout was evaluated in all residencies, it showed a strong correlation with the job stress scale and a moderate correlation with anger. The job stress scale also showed moderate correlation with anger. Job stress (p=0.019) and personal burnout (p=0.002) were found to be higher in women, especially surgical residencies, than in men. **Conclusion:** In this study showed that burnout, job stress, and trait anger were higher in surgical residencies (in the operating room) than in internal medicine residencies, and burnout had a strong correlation with job stress and a moderate correlation with anger.
Keywords: Residencies, Surgery; Burnout; Job Stress, Anger.

Ameliyathane İçinde ve Dışında Çalışan Tıp Asistalarında Tükenmişlik, Öfke Yönetimi ve İş Stresinin Değerlendirilmesi

ÖZ

Amaç: Çalışmanın amacı cerrahi (ameliyathanede) ve dahiliye asistanlarında iş stresi, tükenmişlik ve öfke yönetimini karşılaştırmak, ayrıca tükenmişlik, öfke yönetimi ve iş stresi arasında ilişki olup olmadığını değerlendirmektir. **Gereç ve Yöntem:** Etik kurul onayını takiben cerrahi ve dahiliye asistanlarından iş stresi, Kopenhag tükenmişlik ölçeği ve öfke yönetimi ile ilgili çevrimiçi bir anket doldurmaları istendi. **Bulgular:** Toplam 139 asistan (cerrahi, n=74 ve dahiliye, n=65) için cutoff değerine göre tükenmişlik düzeyi %73 olup, cerrahi asistanlarında dahiliye asistanlarına göre daha yüksek prevalans gözlendi (%77 ve %68, p=0.01). Toplam ve işe bağlı tükenmişlik, sürekli öfke ve iş stresi ölçeklerinin cerrahi grupta anlamlı olarak daha yüksek olduğu belirlendi. Tükenmişlik tüm asistanlarda değerlendirildiğinde iş stresi ölçeği ile güçlü, öfke ile orta düzeyde bir korelasyon gösterdi. İş stresi ölçeği de öfkeyle orta düzeyde korelasyon gösterdi. İş stresi (p=0.019) ve kişisel tükenmişliğin (p=0.002) kadınlarda, özellikle cerrahi asistanlarında, erkeklere göre daha yüksek olduğu belirlendi. **Sonuç:** Bu çalışma, cerrahi asistanlarında (ameliyathanede) tükenmişlik, iş stresi ve sürekli öfkenin dahiliye asistanlarına göre daha yüksek olduğunu, ayrıca tükenmişliğin iş stresi ile güçlü, öfke ile orta düzeyde bir korelasyona sahip olduğunu gösterdi.
Anahtar Kelimeler: Asistanlar, Cerrahi, Tükenmişlik, İş Stresi, Öfke.

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INTRODUCTION

The 'burnout syndrome,' referred to as professional deformation by the World Health Organization (WHO), is explained as the physical, emotional, and behavioral exhaustion, desensitization, and lack of desire to accomplish anything as a result of prolonged intense and stressful work (Edú-Valsania, Laguía & Moriano, 2022). The concept of burnout was first defined in the mid-1970s by two researchers, Maslach and Freudenberger (Maslach & Leiter, 2016). While many studies in literature have used the Maslach Burnout Inventory (MBI), the reliability of this scale has begun to be questioned. As a result, Kristensen and colleagues developed the Copenhagen Burnout Inventory (CBI), which evaluates burnout in three sections: personal, work related, and customer (patient) related burnout (Kristensen et al., 2005). This syndrome, also described as 'chronic workplace stress that has not been successfully managed', was listed by the WHO in the 11th revision of the International Classification of Diseases and Related Health Problems (ICD-11) in 2019 (World Health Organization, 2022). Individuals with burnout syndrome may experience physical symptoms such as chronic fatigue, weakness, loss of energy, frequent headaches, nausea, muscle cramps, sleep disturbances, as well as emotional exhaustion symptoms such as depressive mood, feeling unsupported, insecure, and hopeless (Bianchi, Boffy, Hingray, Truchot, & Laurent, 2013). In recent years, particularly with the impact of the COVID-19 pandemic, an increase in burnout and job stress among healthcare workers has been noticed (Stodolska, Wójcik, Barańska, Kijowska, & Szczerbińska, 2023). As a result of burnout in physicians, anger, irritability, impatience, increased absenteeism, decreased productivity and decreased quality of patient care can be observed (Alahmari, et al. 2022 and Cochran and Elder, 2014). There are many studies examining the level of burnout in physicians working in surgical branches (Galaiya, Kinross, & Arulampalam, 2020 and Wan et al., 2023). Although recent studies have examined the effects of burnout and job stress on medical doctors, we have not come across a study that simultaneously investigates anger management, job stress, and burnout in internal medicine and surgical residencies physicians. The primary aim of the study is to determine whether there is a difference in anger management, job stress, and burnout levels among residencies physicians in internal medicine and surgical departments, and our secondary aim is to examine whether there is a correlation between these three measures.

MATERIALS AND METHODS

Study type and sampling

The study was conducted through online of questionnaires between residencies physicians of a university hospital in Aydin on 2022. After receiving approval from the university's ethics committee (Ethics number: 2022/199), it was sent the online survey form to assistant physicians working in the internal and surgical departments of our hospital. While assistant physicians who had a face-to-face relationship with the patient were included in the study, assistants working in the basic medicine department were not included in the study. In addition, emergency medicine assistants with heavy workload were not included in the study.

Data collection

The survey form aimed to collect information about age, gender, marital status, parental status, city of work, job satisfaction and department satisfaction, as well as "Trait Anger and Anger Expression Scale", "Job stress scale" and "Copenhagen Burnout Inventory". "Trait Anger and Anger Expression Scale" was first created by Spielberger (Spielberger, Jacobs, Russell & Crane, 1983) and adapted into Turkish by Ozer (Ozer, 1994) in our country. The Cronbach-alpha reliability level of the scale was determined by Ozer to be between 0.73 and 0.84. The Cronbach-alpha reliability level of the CBI scale was found to be 0.82 in this study. The scale comprises 34 questions with responses on a four-point Likert scale: 1-None, 2-Slightly, 3-Moderately, 4-Completely (Knight, Chisholm, Paulin, Waal-Manning, 1988). It consists of four sections: Trait anger, anger inside, anger outside, and anger control. The first 10 items measure chronic anger, while the remaining 24 items assess anger expression styles. A high score from the trait anger section indicates that the person who answers the test has a high level of anger, while a high score from the anger-inside section indicates that the anger is suppressed and kept inside. On the other hand, high scores on the anger-out scale indicate that anger is expressed easily, and high scores on the anger-control scale indicate that anger can be controlled. To measure the level of burnout among the residencies, the Copenhagen Burnout Inventory (CBI) was applied. This scale consists of 22 questions with responses on a five-point Likert scale (0=never/almost never, 1=seldom, 2=sometimes, 3=often, 4=always.). A score of zero on the scale indicates no burnout, 1 point indicates a low level of burnout, 2 points indicates a moderate level of burnout, 3 points indicates a high level of burnout, and 4 points indicates a very high level of burnout. Scores are obtained by summing up the responses. The survey questions are divided into three parts: Personal burnout (6 items); work-related burnout (7 items); and client (patient)-induced burnout (6 items) (Kristensen, Borritz, Villadsen, & Christensen, 2005). The recommended cutoff scores for evaluating burnout levels are an average of 50, where scores below this indicate no/low burnout, 50-74 indicate moderate burnout, and scores of 75 and above indicate high burnout (Borritz, et al. 2006).The Cronbach-alpha reliability level of the CBI was found

to be 0.950 in this study.
To assess job stress, the "Job Stress Scale" consisting of 10 questions, developed by Suzanne Haynes (Haynes, Feinleib, & Kannel, 1980) and adapted into Turkish with reliability testing by Aliye Mavili Aktaş (Aktaş, 2001), was used. Scoring for the answers to the 10 questions in the scale is as follows; I completely agree (5), I often agree (4), I sometimes agree (3), I rarely agree (2), I never agree (1). Scores below 20 suggest effective coping with job pressures, while scores of 30 and above indicate job stress at a potentially hazardous level. The Cronbach-alpha reliability level of the "Job Stress Scale" was found to be 0.83 in this study.

Statistical analysis

Statistical analysis was performed using the SPSS program. The Kolmogorov-Smirnov test was used to assess the normality of numeric variables. Independent samples for normally distributed variables were compared using the independent sample t-test, with descriptive statistics presented as mean ± standard deviation. For non-normally distributed variables, paired and independent samples were compared using the Friedman test or Mann-Whitney U test, with descriptive statistics presented as median (interquartile range). The chi-square test was used to compare qualitative variables across groups, with descriptive statistics presented as frequency (%). Relationships between variables were assessed using Spearman's correlation analysis. A p-value of less than 0.05 was considered statistically significant.

Ethical considerations

Ethics committee approval for this study was obtained from Aydin Adnan Menderes University Rectorate, Faculty of Medicine Dean's Office Non-Interventional Clinical Research Ethics Committee (Date: 24.11.2022, Approval no: 2022/199). This study was conducted by the Declaration of Helsinki

RESULTS

For the study, an online survey form was sent to 312 residencies working in internal medicine and surgical departments, and 139 residencies (surgical n=74, internal medicine n=65) completed the survey form entirely. No significant differences were observed between surgical and internal department residencies regarding age, gender, and marital status, parenthood status, city of work, job satisfaction, and departmental satisfaction. However, satisfaction with salary was found to be lower in the surgical group compared to the internal group (p=0.015), (Table 1).

The level of burnout among all residencies, according to the cutoff value (50 points and above), was 73%, with a higher prevalence observed among surgical residencies (77%) compared to internal medicine residencies (68%) (p=0.01). In the surgical department, the highest rates of burnout were observed among general surgery (72%) and anesthesia residencies (81%), while in the internal medicine department, radiology residencies (70%) had the highest rates of burnout. There was no difference between the two groups regarding personal and patient-related burnout and anger-inside, anger-outside, and anger control; however, trait anger (p=0.019) and total anger (p=0.031) were higher among surgical residencies.

Table 1. Basic information of residencies in terms of 2 groups.

	Surgical	Internist	p
Age (year)	28.9±2.1	29.9±3.2	0.243
Gender (%) (Female/Male)	47.3 /52.7	63.1/ 36.9	0.062
residencies year	2.56±1.29	2.27±1.29	0.304
Medicine year	4.1±2.3	4.7±2.8	0.945
Single/Married (%)	59.5/ 40.5	50.8/49.2	0.304
Children (%) (absent/present)	81.1/18.9	81.5/18.5	0.882

Work-related burnout (p=0.042) and job stress scale scores were also higher in the surgical group (p=0.032) Table 2. When evaluating burnout among all residencies, a strong correlation was found between the job stress scale and burnout, and a moderate correlation was observed between anger and burnout. A moderate correlation was also found between job stress and anger (Table 3). In this study, the importance level of the factors affecting burnout using the decision tree method is shown in Figure 1.

According to this method, the factor that has the most impact on burnout is job stress (work stress scale), while anger and other factors were found to be less than 50% effective. When all residencies were evaluated, job stress (p=0.019) and personal burnout (p=0.002) were found to be higher in females compared to males, although no significant difference was observed in anger management. Among females in the surgical group, job stress (p=0.027), personal burnout (p=0.011), and work-related burnout (p=0.012) were found to be higher compared to males. In females in the internal group, only personal burnout (p=0.013) was observed to be higher compared to males.

Table 2. Job stress scale, anger management and burnout values in surgical and internal medicine residencies.

	Surgical	Internist	p
Job stress scale	37.20±6.44	34.67±7.34	**0.032**
Anger-inside	20.18±4.60	19.43±4.07	0.309
Anger-outside	16.59±5.06	14.92±3.78	0.067
Anger trait	22.52±6.58	20.03±5.75	**0.019**
Anger management	23.27±4.99	23.40±5.20	0.881
Anger total	82.58±12.54	77.78 ±9.58	**0.018**
Personal burnout	21.02±5.38	19.40±5.61	0.084
Patient-related burnout	22.14±4.90	21.13±4.71	0.219
Work-related burnout	26.6 ±5.38	23.49 ±4.79	**0.042**
***Burnout total (%)**	77	68	**0.010**

* Total burnout rate (according to cut off value)

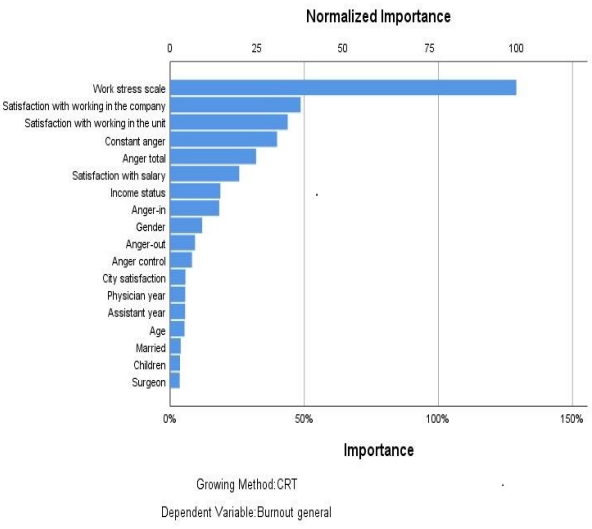

Figure 1. The importance level of factors affecting burnout with the decision tree method.

Table 3. Correlation and significance values of job stress, anger management and burnout scales (for all residencies).

(r/p)	Job stress scale	Anger trait	Anger total	Personal burnout	Work-related burnout	Patient-related burnout
Job stress scale	1.0	0.36 0.001	0.36 0.001	**0.75** 0.001	**0.77** 0.001	**0.66** 0.001
Anger trait	0.365 0.001	1.0	0.76 0.001	0.33 0.001	0.32 0.001	0.34 0.001
Anger Total	0.36 0.001	0.76 0.001	1.0	0.31 0.001	0.32 0.001	0.35 0.001
Personal burnout	0.75 0.001	0.33 0.001	0.31 0.001	1.0	0.88 0.001	0.66 0.001
Work-related burnout	0.77 0.001	0.32 0.001	0.32 0.001	0.88 0.001	1.0	0.78 0.001
Patient-related burnout	0.66 0.001	0.34 0.001	0.35 0.001	0.66 0.001	0.78 0.001	1.0

r: Correlation Coefficient; p: sig. (2-tailed)

DISCUSSION

In this study, job stress, trait anger scores and the prevalence of burnout, work-related burnout were found to be significantly higher among surgical residencies compared to internal medicine residencies. For the first time in literature, this study examined the correlation between burnout, anger, and job stress among medical residencies, revealing a moderate correlation between burnout and anger, and a strong correlation between burnout and job stress. Physicians working in surgical departments work long hours, deal with patients who are stressed due to life-threatening conditions, pay attention to details, and spend little time in their private areas. Most surgeons in the USA work more than 60 hours per week, which is higher than physicians working in other specialties (Galaiya, Kinross, & Arulampalam, 2020). In fact, it is suggested that long working hours and high patient density during physician assistantships are the biggest sources of stress, leading to difficulty in balancing personal and professional life (Mahoney, et al., 2020 and Wan et al., 2023). In addition, in the operating room, teamwork, increased workload, the feeling of technical performance and time pressure, and the necessity to remain constantly vigilant due to the possibility of making sudden and critical decisions can increase job stress among employees. Similarly, job stress was found to be higher in surgical departments than in other physicians in this study. In this study, while total anger and trait anger were found to be higher in surgery residents than in internal

medicine residents, there was no difference in anger in, anger out and anger control. Consistent with our findings, previous studies have shown higher levels of anxiety and trait anger among surgical residencies compared to internal medicine residencies (Koçer et al., 2011; Satar et al., 2005). In fact, surgeons who have specialized are known to be the physicians with the highest rates of disruptive behavior. If anger control is inadequate, destructive behaviors ranging from verbal attacks to throwing objects or hitting people can be observed in these people. Situational stressors (such as something goes wrong during the operation and working with unfamiliar team members), cultural conditions and personality factors may also play a role in inadequate anger control (Cochran, & Elder, 2014). Since this study was conducted on medical assistants, not on specialized surgeons, only trait anger scores may have been higher. Really, in recent years, hospital administrations have shown zero tolerance for destructive behavior resulting from anger, and support communication skills and peer education during the training of residents. Emotional intelligence, defined as awareness of one's own emotions, self-regulation, and adaptability to changing environments, has been shown to play a role in anger management. Developing emotional intelligence has been associated with increased well-being in the workplace, and it is essential for surgeons to manage professional challenges constructively (Abi-Jaoudé et al., 2022; Sen et al., 2018). Recent years have seen numerous articles attempting to determine the level of burnout among physician. A study conducted in Canada found a general prevalence of burnout among residencies physicians to be 58.2%, with a higher prevalence observed among surgical residencies compared to internal medicine residencies (Shalaby et al., 2023). On the other hand, factors such as a closed and noisy environment can also contribute to increased burnout among surgeons and anesthesiologists working in the operating room. Problems with communication and anger management may arise during teamwork due to burnout and job stress (Galaiya, Kinross, & Arulampalam, 2020). Consistent with the literature, this study found that only work-related burnout was higher in surgery residents than in internal medicine residents. In addition, in the surgical department, the highest rates of burnout were observed among general surgery (72%) and anesthesia residencies (81%), while in the internal medicine department, radiology residencies (70%) had the highest rates of burnout in this study. Meta-analyses focusing on medical residencies report that higher burnout rates are seen in general surgery and in radiology departments (Low et al., 2019; Wan et al., 2023). Similarly, a meta-analysis by Chong and colleagues found high levels of burnout among anesthesia residencies within surgical specialties (Chong et al., 2022). Burnout among surgical residencies is influenced by a multitude of factors, including protracted working durations, high-stress occupational settings, the intricacy of medical cases encountered, exigent demands for rapid decision-making, arduous nocturnal duties, recurrent rotations, strained interpersonal dynamics with peers and supervisory staff, hierarchical organizational frameworks, dearth of psychological assistance, constrained leisure time, and financial anxieties (Shalaby, et al.,2023). A review article examining job stress and residencies burnout before and during the COVID-19 pandemic reported a wide range of burnout prevalence (26-76%), with observed risk factors including increased workload and job stress, female gender, surgical specialties, lack of sleep, and difficulty balancing family/work life (Navinés et al., 2021). In this study, we also observed higher levels of job stress and personal burnout among female residencies. Nearly half of doctors feel burnt out, according to Medscape 2023 survey data. According to this research, the leading causes of burnout include working too long hours (41%) and disrespect towards colleagues (40%) (https://www.medscape.com/slideshow/2024-lifestyle-burnout-6016865). Work-related stress results from disruptions in work organization (such as busy work hours and lack of communication between colleagues). It affects employees' behavior (i.e., leads to increased work-related burnout) and can therefore lead to a decrease in the quality of patient care (Yuan, 2023). Consistent with this data, a strong correlation was observed between job stress and burnout in this study. Solutions proposed to reduce burnout include cognitive-behavioral therapy modules, personalized surgical training and mentorship programs, protection against gender-based biases, peer-based information and support sessions, fertility support, standardized guidelines for parental leave and childcare, ensuring work-life balance, and providing psychiatric support as needed. In individuals experiencing emotional exhaustion, negative emotions such as anger, impatience, restlessness, and increased potential for tension and arguments may arise, while positive emotions such as kindness, respect, and friendship may decrease (Bianchi, Boffy, Hingray, Truchot & Laurent, 2013). With burnout, unrest, outbursts of anger and arguments may occur in work environments. On the other hand, in a study examining burnout and risk factors in physicians, it was reported that high levels of anger and anxiety may be risk factors for burnout (Grover, Adarsh, Naskar, & Varadharajan, 2018). In other words, just as high levels of anger can lead to burnout, burnout can also lead to increased levels of anger. In this study, a moderate correlation was found between anger and burnout. The limitations of this study may be that it was conducted in a single center and the number of participants was small. However, we found a strong correlation between job stress and burnout, which is one of this study hypotheses.

The empirical strength of this correlation is 100% for n=139, alpha=0.05.

CONCLUSION

In conclusion, this study found that job stress, burnout rates, work-related burnout, and trait anger were significantly higher among surgical residencies (in the operating room) compared to internal medicine residencies. We also observed a strong correlation between burnout and job stress, and a moderate correlation between burnout and anger. Furthermore, this study revealed that female surgical residencies experienced significantly higher levels of job stress, work-related burnout, and personal burnout. However, we believe that further research is needed in this area, and there is a need for individual and institutional interventions aimed at preventing burnout.

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Conflict of Interest

The author declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Author Contributions

Plan, design: CBS, SS; **Material, methods and data collection:** MA, MD; **Data analysis and comments:** IKO; **Writing and corrections:** CBS, SS.

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Ethical Approval

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Level of Knowledge About Child Neglect and Abuse: A University Sample

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ABSTRACT
Objective: The assessment of how much nursing student knew about child neglect and abuse was set as the goal of this research. **Materials and Methods:** Two hundred and forty-seven nursing students at a university located in Istanbul province made up the sample of this descriptive research. The data collection tools were the Participant Information Form and the Diagnosis Scale of the Risks and Symptoms of Child Abuse and Neglect (DSRSCAN). **Results:** It was determined that 79.4% of the participants were female, 37.2% were first-year students, and 78.5% were from nuclear families. The average age was 19.80±1.19. The mean DSRSCAN score was 246.98±24.38. It was found that 75.3% of the students had received education/information about child neglect and abuse during their undergraduate education, with 63.4% obtaining this information from the internet, 48.4% from their faculty, and 43% from television. Female students had a significantly higher total score on the scale than males (t=2.456; p=0.015). **Conclusion:** The internet was nursing students' primary source of information on child abuse and neglect, and female students' knowledge levels were higher than those of males.
Keywords: Child Neglect, Child Abuse, Nursing Students.

Çocuk İhmal ve İstismarına İlişkin Bilgi Düzeyi: Bir Üniversite Örneği

ÖZ
Amaç: Bu çalışma hemşirelik fakültesi öğrencilerinin çocuk ihmal ve istismarına yönelik bilgi düzeylerinin değerlendirilmesi amacıyla gerçekleştirilmiştir.**Gereç ve Yöntem:** Tanımlayıcı tasarımda gerçekleştirilen çalışma, İstanbul ilinde yer alan bir üniversitenin hemşirelik fakültesinde eğitimlerine devam eden 247 öğrenci ile yürütülmüştür. Katılımcı Bilgi Formu ve Çocuk İhmal ve İstismarının Belirti ve Risklerini Tanılama Ölçeği veri toplama araçları olarak kullanılmıştır. **Bulgular:** Katılımcıların %79.4'ünün kız, %37.2'sinin 1. sınıf öğrencisi ve %78.5'inin çekirdek aile yapısında olduğu saptanmış olup; yaş ortalaması 19.80±1.19'dur. Çocuk İhmal ve İstismarının Belirti ve Risklerini Tanılama Ölçeği puan ortalaması 246.98±24.38'dir. Öğrencilerin %75.3'ünün lisans eğitimleri sırasında çocuk ihmal ve istismarına ilişkin eğitim/bilgi aldığı, %63.4'ünün bu bilgiyi internetten, %48.4'ünün eğitim gördükleri fakülteden, %43'ünün ise televizyondan aldıkları belirlenmiştir. Kız öğrencilerin ölçekten almış oldukları toplam puan erkeklerin puanından anlamlı seviyelerde daha yüksek olarak bulundu (t=2.456; p=0.015). **Sonuç:** Çalışma sonunda elde edilen veriler doğrultusunda hemşirelik öğrencilerinin ihmal istismara ilişkin edindikleri bilgi kaynağının yüksek oranda internet olduğu ve kız öğrencilerin bilgi düzeylerinin erkeklere oranla daha yüksek olduğu saptanmıştır.
Anahtar Kelimeler: Çocuk İhmali, Çocuk İstismarı, Hemşirelik Öğrencileri.

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INTRODUCTION

Individual up to the age of eighteen are considered a child according to the first article of the Convention on Children's Rights, except for those reaching adulthood at an early age (Gürhan, 2015; Türk, 2023). Childhood is defined as a period when the child acquires daily living teachings under the influence of their family and environment. An adversity experienced during childhood negatively affects the child's development, and its effect continues throughout life (Güdek Seferoğlu, Sezici, & Yiğit, 2019; Topçu et al., 2022).

Neglect and abuse are among the negative experiences encountered during childhood. According to the World Health Organization (WHO), child neglect and abuse (CNA) include bad behaviors that result in types of abuse and neglect that negatively affect the growth and development, mental and physical well-being, and sense of trust among children aged <18 years (WHO, 2017). Child abuse is examined in three sub-domains: physical, emotional, and sexual (Alharbi &Moussa, 2023). Child neglect, on the other hand, is defined as the failure to meet the basic needs of the child, such as nutrition, shelter, love, trust, education, treatment, etc., by adults or institutions responsible for their care (Gürhan, 2015; Kurt, Dönmez, Eren, Balcı, & Günay, 2017). Abuse and neglect behaviors affect the child's development in a multidimensional way (physical, emotional, and social), paving the way for behavioral disorders in later ages. CNA is a common social health problem in societies (Alabdulaziz et al., 2024; Poreddi et al., 2016). As with all its types, violence against children is increasing globally (Gürhan, 2015; Sathiadas, Viswalingam, & Vijayaratnam, 2018).

Three out of four children between the ages of two and four are physically and emotionally abused, and one in 13 adult men and one in five adult women have a history of sexual abuse between the ages of 0-17 (WHO, 2020). According to a report on child abuse and domestic violence in our country (2010), the rate of children between the ages of 7 and 18 and the type of abuse they witnessed were 56%, physical abuse; 49%, emotional abuse; 10%, sexual abuse. In the Child Abuse Report-2 (2018) in Türkiye, it was reported that there were 21,068 presentations to Child Monitoring Centers (CMS) across the country between January 2011 and May 2016 and that 85% of the cases were girls. The same report indicated that the number of child victims of sexual crimes increased by 33% between 2014 and 2016.

Preventing child neglect and abuse is extremely critical. There are three steps to do this: primary, secondary, and tertiary prevention (Demirtürk Selçuk &Karadeniz, 2020). Primary prevention includes the preparation of protection programs specific to all childhood periods. It is extremely critical to eliminate risk factors based on these programs (Kemer &İşler, 2021). Improving the living conditions of families and educating them about neglect and abuse are considered primary prevention. Secondary prevention includes identifying high-risk groups within the scope of early diagnosis and treatment and ensuring that these people benefit from existing services (Demirtürk Selçuk & Karadeniz, 2020; Kemer &İşler, 2021). Tertiary step is the prevention of a neglected or abused child from the same situation and the likelihood of death (Demirtürk Selçuk & Karadeniz, 2020; Koçtürk, 2018).

A multidisciplinary team approach is required to prevent child neglect and abuse. Team members should include a doctor, nurse, social worker, child psychologist, teacher, and child development specialist (Akcan &Demiralay, 2016; Sathiadas et al., 2018; Uslu &Zincir, 2016). Nurses have important responsibilities for the prevention, diagnosis, and treatment of CNA. Among the multidisciplinary team members, nurses make the first contact with the child and family, have the opportunity to observe them for a long time, and are the first to access evidence and present it to the court (Akcan & Demiralay, 2016; Pisimisi et al., 2022; Uslu &Zincir, 2016). Therefore, it is necessary to evaluate the awareness, knowledge level, and status of receiving education about neglect and abuse in students, who are prospective nurses. Reflecting on this information, this study was carried out to evaluate the knowledge levels of nursing students about CNA.

In line with the aim of the study, the questions of the study are itemized below:

- What is the level of knowledge of nursing students regarding child neglect and abuse?
- What is the status of nursing students receiving education on child neglect and abuse?
- Is there a difference in the level of knowledge about child neglect and abuse among nursing students across different classes?

MATERIALS AND METHODS

Type of the study

A descriptive design was employed.

Population-sample

There was a population of 273 first- to third-year nursing students from the faculty of a university in Istanbul in the spring semester of the 2018-2019 academic year (n=273). A sample selection procedure was not performed. The data collection phase involved 247 nursing students willing to join the study and filling out the data collection tools completely. Approximately 90.4% of the population was reached. There are no fourth-year students in the sampled faculty. Therefore, this group was not included in the sample.

Measures

A "Participant Information Form" (PIF) and the "Diagnosis Scale of the Risks and Symptoms of Child Abuse and Neglect (DSRSCAN)" were utilized. At the outset, nursing students were informed about the purpose of the study and were asked to fill out the data collection forms individually, which took around 15-20 minutes.

The PIF, prepared by the researchers, was employed to question the socio-demographic characteristics of the participants and whether they had received education about neglect and abuse. It contains 13 questions, including 11 multiple-choice and 2 open-ended.

Uysal (1998) developed the Diagnostic Scale of Risk and Symptoms of Child Abuse and Neglect (DSRSCAN) to help nurses and midwives identify the symptoms and risks of child abuse and neglect. It has 67 items and six sub-dimensions, namely the physical symptoms of abuse in the child, the behavioral symptoms of child abuse in the child, the symptoms of neglect in the child, the characteristics of parents prone to exercise abuse and neglect, the characteristics of children likely to be abused and neglected, and the familial characteristics in child abuse and neglect. Items are scored between 1 (very true) and 5 (not true at all). The total scale score is 67 to 335. Uysal (1998) found Cronbach's alpha of the original scale as 0.92 for the total scale and between 0.59 and 0.89 for the sub-dimensions. Kocaer (2006) found the alpha coefficient as 0.81. This value was found to be 0.87 in our study

Statistical analysis

The NCSS (Number Cruncher Statistical System) 2007 (Kaysville, Utah, USA) software was used for statistical analysis of the data. Descriptive statistics were used in the analyses. Graphical examinations and the Shapiro-Wilk test were utilized to test the normality of quantitative data. Normally distributed quantitative variables were compared using student's t-test in two groups. Groups of >3 were compared with one-way ANOVA. The statistical significance was set at a confidence interval of 95% ($p<0.05$).

Ethical considerations

Ethics committee approval of the study (Date: 28/12/2018, Approval no: 18/99) and written permission (26/12/2018-E.36466) were received from related institutions. Before data collection was initiated, nursing students were informed about the purpose and scope of the study, and their informed consent forms were obtained. Permission of the author who developed the DSRSCAN was obtained.

RESULTS

The descriptive characteristics of the participants are given in Table 1. As seen in the table, 79.4% of them were female, 98% were single, and the mean age was 19.80±1.19. School year of the students was 32.4%, first-year; 37.2%, second-year; and 30.4%, third-year. Also, 78.5% of the students had a nuclear family type, 48.9% were born in the Marmara Region, 54.3% were born in a city, 38.5% had four or more siblings, 40.5% of the fathers and 51% of the mothers were elementary school graduates, and 70% had equal income and expenses (Table 1).

Table 1. Analysis results of the participants' socio-demographic features.

Characteristics		**n**	**%**
Gender	Female	196	79.4
	Male	51	20.6
Marital status	Single	242	98.0
	Married	5	2.0
School year	1	80	32.4
	2	92	37.2
	3	75	30.4
Type of family	Core	194	78.5
	Extended	42	17.0
	Broken	11	4.5
Place of birth	Village	26	10.5
	District	76	30.7
	Province	134	54.3
	Abroad	11	4.5
Region of birth	Mediterranean	17	7.2
	Aegean	9	3.8
	Marmara	116	48.9
	Black Sea	38	16.0
	Central Anatolia	11	4.6
	Southeastern Anatolia	27	11.5
	Eastern Anatolia	19	8.0
Mother's education	Non-literate	28	11.3
	Elementary school	126	51.0
	Middle school	33	13.4
	High school	48	19.4
	University	12	4.9
Total		247	100.0

Table 1 (Continue). Analysis results of the participants' socio-demographic features.

Characteristics		n	%
Father's education	Elementary school	100	40.5
	Middle school	62	25.1
	High school	58	23.5
	University	27	10.9
Number of siblings	1	11	4.5
	2	77	31.2
	3	64	25.8
	≥4	95	38.5
Income	Income<expenses	33	13.4
	Income=expenses	173	70.0
	Income>expenses	41	16.6
Total		247	100.0

Of the participants, 75.3% had received education/information on CNA during their education and 63.4% had received it from the Internet, 48.4% from school, 43% from television, and 37.1% from books/magazines (Table 2).

Table 2. Nursing students' education/ information about child neglect and abuse.

Obtaining information		n	%
Receiving training/obtaining information on CNA during education	Yes	186	75.3
	No	61	24.7
The source of education/information on CNA*	School	90	48.4
	The internet	118	63.4
	Books/magazines	69	37.1
	Conferences	25	13.4
	TV	80	43.0
Total		247	100.0

***Multiple respons

The mean DSRSCAN score was 246.98±24.38 and the total internal consistency was α=0.876. Mean scores and the alpha values of the sub-dimensions are shown in Table 3.

Table 3. Evaluation of the sub-dimension and total scores and alpha values of the DSRSCAN.

	Number of items	Mean±SD	Cronbach's Alpha
Recognizing the physical symptoms of abuse in the child	19	73.83±7.73	0.754
Recognizing the behavioral symptoms of abuse in the child	15	56.11±6.16	0.612
Recognizing the symptoms of neglect in the child	7	27.70±3.70	0.634
Recognizing the characteristics of parents prone to exercise abuse and neglect	13	44.21±6.05	0.586
Recognizing the characteristics of children likely to be abused and neglected	5	15.78±3.17	0.441
Recognizing the familial characteristics in child abuse and neglect	8	29.16±4.69	0.697
Total score	67	246.98±24.38	0.876

The total scores of female students on the DSRSCAN were statistically significant compared to the scores of males (p=0.015). The scores of female students on the "physical symptoms of abuse in the child" and "the symptoms of neglect in the child" sub-dimensions were higher than the scores of males (p=0.019; p=0.001). There was no statistical significance between the total and subscale scores on the DSRSCAN according to the student's school year and receiving education on child neglect and abuse (p>0.05) (Table 4).

Table 4. Evaluation of the total and sub-dimension scores of the DSRSCAN according to nursing students' descriptive characteristics.

			The physical symptoms of abuse in the child	The behavioral symptoms of abuse in the child	The symptoms of neglect in the child	The characteristics of parents prone to exercise abuse and neglect	The characteristics of children likely to be abused and neglected	The familial characteristics in child abuse and neglect	Total score
Gender	**Female (n=196)**	Median (Min.-Max.)	75 (57-93)	57 (42-75)	28 (17-35)	44 (27-61)	16 (5-25)	29 (16-40)	247 (192-324)
		Mean±SD	74.42±7.7	56.41±5.98	28.12±3.64	44.42±6.07	15.87±3.27	29.42±4.73	248.91±24.4
	Male (n=51)	Median (Min.-Max.)	71 (57-89)	54 (40-70)	26 (19-33)	42 (30-61)	15 (11-25)	28 (19-40)	239 (208-305)
		Mean±SD	71.57±7.5	54.94±6.75	26.12±3.55	43.37±5.98	15.43±2.76	28.16±4.41	239.59±23.1
	Test value		t=2.368	t=1.519	t=3.514	t=1.105	t=0.884	t=1.719	t=2.456
	p		**[a]0.019***	[a]0.130	**[a]0.001****	[a]0.270	[a]0.378	[a]0.087	**[a]0.015***
School year	**1 (n=80)**	Median (Min.-Max.)	75 (62-90)	57.5 (45-68)	27 (20-35)	43 (30-61)	15 (8-25)	29 (18-40)	246.5 (211-312)
		Mean±SD	74.76±6.99	57.01±5.62	27.8±3.18	44.1±5.79	15.41±3.26	28.99±4.44	248.08±21.54
	2 (n=92)	Median (Min.-Max.)	74 (57-89)	56 (42-75)	27 (17-35)	43 (27-61)	16 (9-25)	29 (19-40)	245 (192-324)
		Mean±SD	73.27±7.99	56.05±6.37	27.41±3.64	44.23±6.53	15.95±3.12	29.4±5.05	246.32±26.09
	3 (n=75)	Median (Min.-Max.)	74 (57-93)	55 (40-71)	28 (19-35)	43 (34-61)	16 (5-25)	29 (16-40)	241 (199-316)
		Mean±SD	73.52±8.16	55.2±6.39	27.96±4.28	44.29±5.8	15.97±3.15	29.04±4.53	246.64±25.34
	Test value		F=0.882	F=1.691	F=0.461	F=0.021	F=0.800	F=0.200	F=0.121
	p		[b]0.415	[b]0.187	[b]0.631	[b]0.980	[b]0.450	[b]0.819	[b]0.886
Receiving education/information on abuse and neglect	**Yes (n=186)**	Median (Min.-Max.)	74 (57-93)	55 (40-75)	28 (19-35)	43 (27-61)	15 (5-25)	29 (16-40)	245 (192-324)
		Mean±SD	73.62±7.36	55.69±5.94	27.86±3.62	43.98±5.82	15.84±3.14	29.04±4.76	246.31±23.88
	No (n=61)	Median (Min.-Max.)	75 (57-90)	58 (42-68)	27 (17-35)	43 (35-61)	15 (8-25)	29 (18-40)	245 (199-312)
		Mean±SD	74.48±8.8	57.36±6.67	27.23±3.93	44.89±6.72	15.59±3.28	29.51±4.46	249.05±25.94
	Test value		t=-0.686	t=-1.843	t=1.155	t=-1.009	t=0.542	t=-0.672	t=-0.762
	p		[a]0.494	[a]0.066	[a]0.249	[a]0.314	[a]0.589	[a]0.502	[a]0.447

[a]Student's t-test, [b]One-way ANOVA, *p<0.05, **p<0.01.

DISCUSSION

Participants' descriptive characteristics in this research were similar to those in the literature (Akcan & Demiralay, 2016; Akgün Kostak & Vatansever, 2015; Demir Acar & Bulut, 2021; Güdek Seferoğlu et al., 2019; Pehlivan, 2016; Topçu et al., 2022).

The majority of the students (75.3%) had received training/information on CNA (Table 2). Nursing students need to receive education on CNA during their undergraduate education to increase their knowledge and awareness in their professional lives. Therefore, relevant education should be included in undergraduate programs (Skarsaune &Bondas, 2016). The rate of nursing students learning about CNA at school was reported as 51% by Akgün Kostak and Vatansever (2015), 81.5% by Uslu and Zincir (2016), 68.1% by Kurt et al. (2017), 89.8% by Sathiadas et al. (2018), 69% by Başdaş and Bozdağ (2018), 67.7% by Güdek Seferoğlu et al. (2019), and 62.3% by Tek and Karakaş (2021). Our results were consistent with those of other studies. This may have been because CNA-related content was included in the course curricula of the schools where the studies were conducted. Unlike these studies, 77.8% of the students in a study by Pehlivan (2016) and 73.7% in a study by Pisimisi et al. (2022) had not received any information about CNA. Another study indicated that 59.1% of health professionals had not received training on neglect and abuse during their undergraduate education (Işık Metinyurt & Yıldırım Sarı, 2016). Özcan (2022) found that 35.5% of the nurses had received training on CNA. Topçu et al. (2022) reported that less than half of the students (35.6%) had received training on CNA. It is thought that the lack of support for our findings was because there was no time and content standards about CNA in the nursing curriculum.

Participants in the study had received education/information about CNA from the internet (63.4%), school (48.4%), television (43%), books/magazines (37.1%), and conferences (13.4%), (Table 2). In the literature, students' source of information on CNA was reported as follows: the internet:70.3% (Pisimisi et al., 2022); school: 82.2% (Topçu et al., 2022) and 69.4% (Tek &Karakaş, 2021); television, books or magazines:38.7%, school: 19.8%, and conferences: 9.2% (Güdek Seferoğlu et al., 2019); school: 56% and the internet and media: 14% (Pehlivan, 2016). In the literature, students' sources of information about CNA varied. This may have been due to easy access to information on the internet and the non-standard of CNA courses in schools. Half of the nursing students in our study had received education/information from school because the course content on CNA was included in the course curriculum of the university where the study was conducted.

Nurses encounter CNA cases, especially in emergency rooms. They must have knowledge and skills regarding CNA to diagnose the case, provide appropriate care, and report it. They should acquire this knowledge and skills in their undergraduate nursing education (Topçu et al., 2022). Participants' mean DSRSCAN total score was 246.98±24.38 in the study. Karakaş (2019) found the mean DSRSCAN score of nursing students as 231.6. Özcan (2022) determined it as 258.16±23.78. The mean DSRSCAN total knowledge score was found as X=3.68±0.36 by Topçu et al. (2022), 3.45+0.45 by Tek and Karakaş (2021), 2.36±0.50 by Başdaş and Bozdağ (2018), and 3.71±0.56 by Demir Acar and Bulut (2021). Students' knowledge levels about CNA were found as inadequate in some studies (Akcan & Demiralay, 2016; Akgün Kostak & Vatansever, 2015; Güdek Seferoğlu et al., 2019; Pisimisi et al., 2022; Poreddi et al., 2016). This may have been because students did not have enough experience with CNA. To achieve a desired development in knowledge and awareness about CNA, the subject should be included in the curriculum in undergraduate education and the training content should be reinforced through simulation applications, conferences, and seminars and repeated in in-service training programs.

Early diagnosis and intervention play a key role in preventing the consequences of neglect and abuse, such as serious injury, disability, emotional disorder, and developmental delay. Nurses should be able to make an early diagnosis before the negative effects of neglect and abuse occur. To do this, they need to know about possible CNA symptoms. CNA is more common, especially in unwanted pregnancies, multiple pregnancies, premature or low birth weight babies, and in children who have chronic diseases and special needs, need constant care, and cannot meet the expectations of their parents (Topçu et al., 2022). The students got the lowest significant score on the "characteristics of children likely to be abused and neglected" sub-dimension of the DSRSCAN. This result showed that they did not have enough knowledge and needed more information about early detection of children more likely to be neglected and abused. In the literature, the lowest score was obtained from the "characteristics of children likely to be abused and neglected" sub-dimension (Başdaş & Bozdağ, 2018; Demir Acar & Bulut, 2021; Güdek Seferoğlu et al., 2019; Işık Metinyurt &Yıldırım Sarı, 2016; Özcan, 2022; Tek & Karakaş, 2021; Topçu et al., 2022), similar to our study result. Students received the highest score from the "physical symptoms of abuse in the child" sub-dimension of the DSRSCAN. In the literature, the highest score was obtained from the " symptoms of neglect in the child" sub-dimension of the same scale (Demir Acar & Bulut, 2021; Güdek Seferoğlu et al., 2019; Özcan, 2022; Tek & Karakaş, 2021; Topçu et al, 2022). Our study result differed from others in this respect. It is thought that students got higher scores from the "symptoms of neglect in the child" sub-dimension because these symptoms were concrete and easily identifiable.

In the study, female students had statistically significantly higher total scores on the DSRSCAN than males (p=0.015). The scores of females on the "physical symptoms of abuse in the child" and "symptoms of neglect in the child" sub-dimensions of the scale were higher than the scores of males (p=0.019; p=0.001). While there was no difference between the gender and knowledge levels of students in some studies (Başdaş &

Bozdağ, 2018; Demir Acar & Bulut, 2021), the knowledge scores of the males were significantly higher than those of females in some others (Alabdulaziz et al., 2024). On the other hand, there were some studies showing that females had significantly higher knowledge scores than males (Güdek Seferoğlu et al., 2019; Tek & Karakaş, 2021). Female students had higher scores because the female gender is exposed to violence more in our society and therefore, they have a higher sensitivity to violence against children.

In the study, the scores of the participants on the sub-dimensions of the scale and the total scale did not show a statistically significant difference according to the school year ($p>0.05$). While there was no significant difference between students' school year and their scores in some studies (Demir Acar & Bulut, 2021; Karakaş, 2019; Özbey, Özçelep, Gül, & Kahriman, 2018; Pisimisi et al., 2022), the opposite was true in some others (Abdulaziz et al., 2024; Güdek Seferoğlu et al., 2019; Karakaş, 2019; Poreddi et al., 2016). Abdulaziz et al. (2024) found a statistically significant difference between the DSRSCAN scores of health students according to their school year. The scores of 2nd-year students were significantly higher than those of 3rd- and 4th-year students. In the study by Topçu et al. (2022), the DSRSCAN scores of 4th-year students were significantly higher than those of 3rd-year students. The scores of nursing students from the subscales and the total scale did not differ significantly according to whether they had received training/information on CNA during their education ($p>0.05$). In the study by Topçu et al. (2022), the scale scores of students who had received training on child abuse were significantly higher than those of students who had not. No statistical significance was found between having received education on CNA and the mean DSRSCAN scores in the study by Güdek Seferoğlu et al. (2019), ($p<0.05$). The mean score of those who had received education on CNA was found to be higher than the scores of those who had not. Karakaş (2019) and Özbey et al. (2018) found the scores of students who had obtained information about CNA were higher than the scores of those who had not. It is thought that the reason for the high level of knowledge of senior students was that there were theoretical and practical courses on pediatrics, public health, and mental health in the curriculum in the last two years of nursing education, which was assumed to increase CNA-related gains. It is thought that the existence of studies in the literature that did not support our findings was because the university sampled during the data collection process of the study did not yet have any 4th-year students.

Limitations and Strengths

The limitation of this study is that data were collected solely from nursing students of a single university and that the sampled university did not have any senior students at the time of data collection.

CONCLUSION

In the study, it was seen that students did not know enough about the characteristics of children who were likely to be neglected and abused and that female students had better knowledge about CNA. To increase the knowledge level of students, it is recommended that the nursing curriculum should include more detailed information on issues related to the promotion, improvement, and protection of child health, prevention of neglect and abuse cases, early diagnosis and early initiation of interventions, and legal responsibilities when CNA is encountered, the subjects should be arranged to cover all classes and standardized in all schools, simulation activities that allow students to practice real clinical scenarios should be conducted to increase their sensitivity on this subject, and that they should be supported to participate in current congresses.

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Conflict of Interest

The authors declare that there is no conflict of interest in the conduct of the study. All authors are informed about submitting this article to Balıkesir Health Sciences Journal.

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Ethical Approval

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An Analysis of the Attitudes of Nursing Students toward Honor and Violence Committed against Women to Protect Honor

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ABSTRACT

Objective: This study aims to analyze the attitudes of nursing students toward honor and violence committed against women to protect honor. **Materials and Methods:** This cross-sectional study was conducted in Uludag University Faculty of Health Sciences. The population of the research consisted of students studying in the Nursing Department of the Faculty of Health Sciences in the spring academic semester of the 2021-2022 academic year (N=700). The sample was calculated as 249 students (n=249) with a 95% confidence level and a 5% margin of error, using a known population sampling method. The study was completed with 317 students. **Results:** In this study, it was found that the mean Attitudes toward Honor Scale and Attitudes toward Violence against Women for Protecting Honor Scale scores of nursing students were respectively 45.26±6.68 and 43.48±5.69, and the participants exhibited moderately positive attitudes toward honor and violence committed against women to protect honor. The mean scale scores of the participants varied significantly based on the variables of gender, marital status, and family type ($p<0.05$). **Conclusion:** In conclusion, it is thought that there is a need for a systematic behavioral change in the perceptions of nursing students on gender, violence against women, and honor.

Keywords: Honor, Violence, Women, Nursing, Students, Attitude.

Hemşirelik Öğrencilerinin Namus ve Namus Adına Kadına Uygulanan Şiddete İlişkin Tutumlarının Bir Analizi

ÖZ

Amaç: Bu çalışmanın amacı hemşirelik öğrencilerinin namusa ve namus adına kadına uygulanan şiddete ilişkin tutumlarını incelemektir. **Gereç ve Yöntem:** Kesitsel nitelikteki bu çalışma, Uludag Üniversitesi Sağlık Bilimleri Fakültesi'nde gerçekleştirildi. Araştırmanın evrenini 2021-2022 eğitim-öğretim yılı bahar döneminde Sağlık Bilimleri Fakültesi Hemşirelik Bölümünde öğrenim gören öğrenciler oluşturmuştur (N=700). Örneklemi ise evreni bilinen örnekleme yöntemi ile %95 güven aralığı ve %5 hata payında 249 öğrenci (n=249) olarak hesaplanmıştır. Çalışma 317 öğrenci ile tamamlanmıştır. **Bulgular:** Öğrencilerin namusa ilişkin tutum ölçeği ve namus adına kadına uygulanan şiddete ilişkin tutum ölçeğinden aldıkları puan ortalamalarının sırasıyla 45.26±6.68 ve 43.48±5.69 olduğu ve öğrencilerin namusa ve namus adına kadına uygulanan şiddete yönelik orta düzeyde olumlu tutuma sahip olduğu belirlenmiştir. Cinsiyet, medeni durum ve aile tipi değişkenleri ile ölçek puan ortalamaları arasında anlamlı ilişki bulunmuştur ($p<0.05$). **Sonuç:** Sonuç olarak hemşirelik öğrencilerinin cinsiyet, kadına yönelik şiddet ve namus algılarında sistematik bir davranış değişikliğine ihtiyaç olduğu düşünülmektedir.

Anahtar Kelimeler: Namus, Şiddet, Kadın, Hemşirelik, Öğrenciler, Tutum.

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INTRODUCTION

In honor-based societies, personal moral standards are deeply shaped by the expectations of the family and society (Ne'eman-Haviv, 2021). In several developed countries across the world, honor is addressed as a concept that characterizes positive behaviors for women and men (Gürsoy and Arslan Özkan, 2014). However, in developing countries, particularly in Muslim societies, the sharp sex discrimination regarding the concept of honor catches the eye, and it is observed that the concept of honor is interpreted very differently in regard to the woman and the man (Ne'eman-Haviv, 2021). The concept of honor that is identified with attributes, which each human being needs to have as a condition of being a human, such as righteousness, honesty, and trustworthiness, is identified with the woman's sexual purity and is also equated with her virginity (Bhanbhro, Cronin de Chavez and Lusambili, 2016; Henry, Hayes, Freilich and Chermak, 2018). Such that, alongside the term, "family honor", some relevant social norms refer to the virginity of single women and the faithfulness of married women (Bhanbhro et al., 2016; Eshet and Sela, 2016).

In developing countries, honor is discussed in the context of not only sexual intercourse but also a large variety of behaviors, such as clothing styles, holding hands with the opposite sex, kissing, dating, not paying heed to the man's instructions, and laughing loudly, which are among the behaviors that are considered to be associated with the woman's sexual purity (Gürsoy and Arslan Özkan, 2014; Kaya and Turan, 2018). According to this view, for a woman to be an honorable person, she should pay attention to her lifestyle and control her behaviors, and accordingly, protect her honor. This, at the same time, means protecting the honor and glory of the family and the man in the family. This is because the woman's honor is viewed as the honor of the man and the family (Gürsoy and Arslan Özkan, 2014; Kaya and Turan, 2018). In this context, if a woman's behavior harms her honor or the honor of her family, it requires her punishment in a variety of ways, and thus, violence is committed against women to protect honor, and women are even killed for honor (Eshet and Sela, 2016; Henry et al., 2018). In countries adopting this concept of honor, violence committed against women to protect honor is used as a tool to serve the man in controlling the woman and establishing dominance over her in the societal and sexual sense (Bhanbhro et al., 2016; Yeşilçiçek Çalık, 2018). The gender discrimination that is upheld by the male-dominated culture from the past to the present lies at the foundation of this understanding, which is a significant public health concern (Gürsoy and Arslan Özkan, 2014). Gender discrimination is shaped by roles that society attributes to individuals based on their gender (Bulut and Yıldırım, 2018). Hence, women and men are supposed to meet the roles expected for them by society. In general, working, assuming the care of the family, and protecting the women in the family are the man's gender roles, whilst staying a virgin until marriage, marrying a person approved by the family, not communicating with a man who is a relative, taking care of children, and doing housework are the woman's gender roles (Bulut and Yıldırım, 2018; Gürsoy and Arslan Özkan, 2014; Kaya and Turan, 2018). In the World Economic Forum's Global Gender Gap Report 2021, it was stated that Turkey, where gender discrimination is deeply felt, ranked 133rd out of 156 countries (World Economic Forum, 2021).

Honor, which is quite important in Turkey as in the case of several developing countries, is a concept that affects women's lives negatively and even results in their death (Yeşilçiçek Çalık, 2018). Remarks such as "you live and die for your honor", "in grave clothes, you return home which you left in a wedding gown", and "if unbeaten, the woman resembles an ungroomed horse" exactly highlight the sexist perception of honor and the significance of this perception in Turkey (İnci, 2013; Yeşilçiçek Çalık, 2018). Some of the most saddening and devastating outcomes of the honor culture in Turkey are, of course, violence and femicide committed against women to protect honor (Gürsoy and Arslan Özkan, 2014; Yeşilçiçek Çalık, 2018). According to the latest data released by the We Will Stop Femicide Platform, 474 women in 2019, 436 women in 2020, and a total of 3621 women in 2008-2020 became victims of femicide committed by men in the name of honor in Turkey. Of these femicides, 48.4% were committed by the spouse/partner, 30.2% were committed by the family/relative/acquaintance, 12.3% were committed by unknown individuals, and 9.1% were committed by the ex-spouse/partner (We Will Stop Woman Murder Platform, 2021). Upon the review of studies performed on attitudes toward honor in Turkey, it was seen that various studies on university students have shown that the young and educated population can have a positive attitude toward honor and honor-based violence (Gürsoy and Arslan Özkan, 2014; Kocadaş, 2016). In a study conducted with university students, it was reported that male students had positive views about violence committed against women to protect honor (Öztürk, 2019). In another study performed with male university students, it was stated that male students had a tendency to have a traditional, honor-based understanding of pre-marital sex (Çaylan Çağlayan and Topatan, 2020). In a study that analyzed the effects of learned honor perceptions on homicide, it was discerned that honor was associated with a woman's sexual purity and faithfulness (Ateş, 2020).

Based on the review of the relevant literature that was conducted in this study, the majority of studies on honor and violence committed against women to protect honor have been performed with the participation of students from different university

departments. Nevertheless, it was found that such a sensitive topic has not been studied extensively in relation to nursing students who will assume the role of representatives and advocates of the healthcare system in the future. Therefore, this study that is thought to contribute to the relevant literature aims to analyze the attitudes of nursing students toward honor and violence committed against women to protect honor.

MATERIALS AND METHODS

Study design

The aim of this cross-sectional study is to analyze the attitudes of nursing students toward honor and violence committed against women to protect honor.

Setting and participants

The population of the study comprised students who were studying at the department of nursing of the faculty of health sciences of a public university in Turkey in the spring semester of the academic year of 2021-2022 (N=700). The sample size required for the study was calculated as 249 students with the sample size calculation formula for a known population in a 95% confidence level and at a 5% margin of error (n=249). The study was completed with a total of 317 students.

Data collection

The data were collected online via the Google Forms platform between 1 and 10 June 2022. The Google Form that was created in the context of this study included four parts. The first part had a text with information on the research topic, the ethical aspects of the study, its ethical approval by the Ethics Committee, its aim, and the confidentiality of the data to be collected. Students were informed that participation in the study was voluntary, they were free to withdraw from the study in any phase, and they were not required to give an excuse to do so. After receiving this information, students were supposed to click a yes/no button that asked whether they agreed to participate in the study. Students who agreed to participate in the study by clicking the "yes" button could access the survey form and answer the questions in the second, third, and fourth parts. The second part of the form comprised questions designed to collect information out about the sociodemographic characteristics of the participants, while the third and fourth parts included successively the Attitudes toward Honor Scale and the Attitudes toward Violence against Women for Protecting Honor Scale.

Instruments

A Sociodemographic Data Collection Form, the Attitudes toward Honor Scale, and the Attitudes toward Violence against Women for Protecting Honor Scale were used in the data collection process.

The Sociodemographic Data Collection Form: This form had questions designed to collect information about the sociodemographic characteristics of the participants such as gender, class year, perceived economic status, marital status, and their parents' education levels.

The Attitudes toward Honor Scale (AHS): The AHS was developed by Işık and Sakallı-Uğurlu (2009) with the participation of university students to identify attitudes toward honor. Through e-mail conversations with one of the authors who developed the AHS, it was learned that the AHS is suitable for the adult population including students. The AHS is a six-point Likert-type scale that includes 14 items and no subscale (1: I strongly disagree, 6: I strongly agree). The AHS has no cut-off point. The calculation of the total AHS score is based on the summation of scores obtained by a respondent from each AHS item. The minimum and maximum scores to be obtained from the AHS are 14 and 84. Higher AHS scores show a higher tendency to associate a woman's honor with her virginity/sexual behaviors, approval of the control of the woman by family members, and the overall honor of the family. The Cronbach's alpha internal consistency coefficient of the scale was reported as 0.94. In this study, the Cronbach's alpha coefficient of the scale was calculated as 0.87.

The Attitudes toward Violence against Women for Protecting Honor Scale (AVWPHS): The AVWPHS was developed by Işık and Sakallı-Uğurlu (2009) with the participation of university students to identify attitudes toward violence committed against women to protect honor (Işık and Sakallı Uğurlu, 2009). Through e-mail conversations with one of the authors who developed the AVWPHS, it was learned that the AVWPHS is suitable for the adult population including students. The AVWPHS is a six-point Likert-type scale that is composed of 14 items and no subscale (1: I strongly disagree, 6: I strongly agree). The AVWPHS has no cut-off point. The calculation of the total AVWPHS score is based on the summation of scores obtained by a respondent from each AVWPHS item. The minimum and maximum scores to be obtained from the AVWPHS are 14 and 84. Higher AVWPHS scores reflect positive attitudes toward violence committed against women to protect honor. The Cronbach's alpha internal consistency coefficient of the scale was reported as 0.91. In this study, the Cronbach's alpha coefficient of the scale was calculated as 0.84.

Research variables

Dependent variables: The depend variables are Attitudes toward Honor Scale point and The Attitudes toward Violence against Women for Protecting Honor Scale point.

Independent variables: Independent variables are the gender, class, marital status, employment status, education level of parents, income level, region of residence and family type of the students in the study.

Data analysis

The collected data were analyzed with the Statistical Package for the Social Sciences (SPSS) 23.0. Descriptive statistics including frequencies and percentages were used in the analysis. Besides, the

Kolmogorov-Smirnov test was utilized to analyze whether the data were normally distributed.
To test the suitability of the data set for normal distribution; Kolmogorov-Smirnov test, skewness and kurtosis coefficient and coefficient of variance (standard deviation/mean) values were examined. The relevant test values are as follows;

- Kolmogorov-Smirnov test: $p>0.05$
- Skewness coefficient: -1.133
- Kurtosis coefficient: 1.108
- Coefficient of variance: 17%

If the data were normally distributed, the t-test was used in the comparisons of two groups, and one-way analysis of variance (ANOVA) was employed in the comparison of more than two groups. The relationship between the AHS and AVWPHS scores of the participants was analyzed with Pearson's correlation coefficient and simple linear regression analysis. The level of statistical significance was accepted as $p<0.05$.

Ethical considerations

To conduct the study, ethical approval was obtained from the Social Sciences and Humanities Research and Publication Ethics Committee of the university where the study would be carried out (Date: 27.05.2022, Approval no: 2022/05-19).

RESULTS

It was determined that 76.0% of the participants were female, 27.1% were first-year students, 2.5% were married, 82.3% were from a nuclear family, 30.3% were from a household with an income lower than expenses, 6.9% were working in an income-generating job, 5% had illiterate mothers, 0.9% had illiterate fathers, and 55.8% were from families residing in the Marmara Region of Turkey. Table 1 displays the breakdown of the sociodemographic characteristics of the participants.

Table 1. The breakdown of students' socio-demographic characteristics.

Characteristics		**n**	**%**
Gender	Female		
	Male	241	76.0
		76	24.0
Class year	First-year	86	27.1
	Second-year	86	27.1
	Third-year	80	25.2
	Fourth-year	65	20.5
Marital status	Married	8	2.5
	Single	309	97.5
Family type	Nuclear family	261	82.3
	Extended family	56	17.7
Household's income level	Income below expenses	96	30.3
	Income equaling expenses	197	62.1
	Income above expenses	24	7.6
Employment status	Working	22	6.9
	Not working	295	93.1
Mother's education level	Illiterate	16	5.0
	Literate	18	5.7
	Primary school	186	58.7
	High school	69	21.8
	Undergraduate program	27	8.5
	Master's program	1	0.3
Father's education level	Illiterate	3	0.9
	Literate	6	1.9
	Primary school	141	44.5
	High school	112	35.3
	Undergraduate program	50	15.8
	Master's program	5	1.6
The geographical region of the family residence in Turkey	Marmara Region	177	55.8
	Aegean Region	31	9.8
	Mediterranean Sea Region	21	6.6
	Central Anatolia Region	27	8.5
	Black Sea Region	17	5.4
	East Anatolia Region	26	8.2
	South-East Anatolia Region	18	5.7
Total		317	100.0

The means AHS and AVWPHS scores of the participants were respectively 45.26±6.68 and 43.48±5.69. The mean AHS and AVWPHS scores of the participants varied significantly based on the

variables of gender, marital status, and family type ($p<0.05$). Table 2 shows the comparisons of the mean AHS and AVWPHS scores of the participants based on their sociodemographic characteristics.

Table 2. The comparisons of students' mean AHS and AVWPHS scores as per their socio-demographic characteristics.

Characteristics	AHS (X̄±SD)	AVWPHS (X̄±SD)
Gender		
Female	40.70±6.33	42.09±4.47
Male	47.88±7.56	48.55±8.23
t; p	**2.081; 0.038**	**3.445; 0.001**
Class year		
First-year (1)	45.59±6.13	44.22±4.58
Second-year (2)	45.13±8.50	42.44±8.66
Third-year (3)	45.36±5.64	43.75±3.92
Fourth-year (4)	44.87±5.89	43.55±5.69
F; p	0.157; 0.925	1.508; 0.212
Marital status		
Married	45.87±4.55	43.37±13.81
Single	41.35±6.37	36.66±5.25
t; p	**1.456;0.014**	**3.643; 0.001**
Family type		
Nuclear family	45.01±6.57	43.38±5.65
Extended family	48.41±7.12	49.94±5.90
t; p	**1.416; 0.018**	**0.671; 0.031**
Household's income level		
Income below expenses (1)	46.00±6.25	43.16±6.77
Income equaling expenses (2)	45.12±6.89	43.65±4.94
Income above expenses (3)	43.45±6.39	43.29±5.69
F; p	1.505; 0.224	0.225; 0.775
Employment status		
Working	44.72±4.92	43.00±3.61
Not working	45.30±6.80	43.58±5.82
t; p	0.391; 0.610	0.411; 0.681
Mother's education level		
Illiterate	45.00±9.38	43.06±5.14
Literate	46.77±5.09	43.61±4.56
Primary school	45.31±6.96	43.76±5.23
High school	44.84±5.62	43.27±6.59
Undergraduate program	45.22±6.71	42.22±7.36
Master's program	44.00±3.22	44.00±3.00
F; p	0.251; 0.939	0.390; 0.855
Father's education level		
Illiterate	46.66±5.68	46.66±7.50
Literate	51.33±3.82	44.16±7.22
Primary school	45.12±7.09	43.55±5.97
High school	45.55±6.71	43.00±5.36
Undergraduate program	44.20±5.72	43.82±5.53
Master's program	45.00±2.00	43.48±5.69
F; p	1.323; 0.256	0.591; 0.707
The geographical region of the family residence in Turkey		
Marmara Region	44.81±6.50	43.75±5.63
Aegean Region	45.61±7.29	43.61±4.30
Mediterranean Sea Region	45.71±8.14	42.14±7.87
Central Anatolia Region	46.92±5.28	41.59±7.39
Black Sea Region	45.35±5.26	44.29±2.84
East Anatolia Region	45.11±6.59	43.96±5.14
South-East Anatolia Region	46.22±6.68	43.50±6.01
F; p	0.502; 0.807	0.846; 0.059
Total	45.26±6.68	43.48±5.69

X̄: Mean, SD: Standard Deviation, t: Independent samples t-test, F: One-way analysis of variance (ANOVA)

A statistically significant positive relationship was identified between the AHS and AVWPHS scores of the participants (r=0.346). Table 3 presents the results of the Pearson's correlation analysis conducted to identify the correlation between the AHS and AVWPHS scores of the participants.

According to the results of the simple linear regression analysis, every one-unit change in AHS scores would correspond to a 0.38 change in AVWPHS scores. The explanatory power of the regression model was 0.250, suggesting that 25.0 % of the variance of AVWPHS can be explained by AHS. Table 4 exhibits the results of the simple linear regression analysis conducted on the AHS and AVWPHS scores of the participants.

Table 3. The results of Pearson's correlation analysis on the correlation between students' AHS and AVWPHS scores

Pearson's correlation coefficient	**AVWPHS scores**
AHS scores	0.346*

*p<0.01

Table 4. The results of the simple linear regression analysis conducted on students' AHS and AVWPHS scores.

Regression Model	**Unstandardized**		**Standardized**	**t**	**p**
	β	**SH**	**β**		
AVWPHS AHS	0.383	0.047	0.250	4.587	0.001
R^2= 0.250; DW=1.966; F= 21.037					

R^2: Adjusted R-Squared, DW: Durbin-Watson, F: Analysis of variance

DISCUSSION

In traditionalist cultures, overseeing the woman's behaviors and drawing her boundaries in society to protect the honor of the family is accepted as the man's conventional and primary duty, and violence/femicide committed against women by men to protect the honor of the family is portrayed as legitimate (Demirel, Kaya, Ertekin Pınar, Değerli and Gökmen 2019; Henry et al., 2018). It is known that university-level nursing students who will assume the representation and advocacy of the field of healthcare in society in the future are likely to have difficulty providing health services, particularly in traditionalist cultures where the concept of honor is still perceived as a taboo (Kızılırmak and Çakıcı, 2021). Therefore, analyzing the perceptions of individuals, especially nursing students, regarding honor is of importance. In this respect, this study aimed to analyze the attitudes of nursing students toward honor and violence committed against women to protect honor.

First, in this study, it was found that the AHS and AVWPHS scores of the participants were successively 45.26±6.68 and 43.48±5.69, and the participants exhibited moderately positive attitudes toward honor and violence committed against women to protect honor. Besides, it was discerned that the male students had more positive attitudes toward the concept of honor. In the relevant literature, in a similar vein to our study, numerous studies have shown that male students have a more traditionalist approach and more positive attitudes toward honor than female students (Aktaş and Polat Kürcü, 2020; Demirel et al., 2019; Er Güneri and Şen, 2018; Gürsoy and Arslan Özkan, 2014; Kaya and Turan, 2018; Kızılırmak and Çakıcı, 2021; Kömürcü, Yıldız, Toker, Karaman, Koyucu and Durmaz, 2016; Yeşilçiçek Çalık, 2018). In contrast to the finding of our study, the study conducted by Yağbasan and Kolyiğit (2016) revealed that traditionalism was more dominant in female students (Yağbasan and Kolyiğit, 2016). Moreover, as in our study, studies analyzing attitudes toward violence committed against women to protect honor have reported that male students exhibit such attitudes at higher levels (Baysan Arabacı, Büyükbayram Arslan, Taş Soylu, Kurt and Kurt, 2021; Demirel et al., 2019; Gursoy, McCool, Sahinoglu and Yavuz Genc, 2016; Haviv, 2021; Kaya and Turan, 2018; Yeşilçiçek Çalık, 2018). These results reflect the effects of the patriarchal structure on women and family dynamics in Turkey. Especially the imposition of the concept of honor on the woman, also by nursing students, who will practice a profession with a philosophy based on loving and helping people, and the exhibition of a more positive attitude toward honor by male students, bring the dominant effect of traditional culture to light. Considering particularly the growing need for intercultural nursing care as a consequence of the

formation of multi-cultural structures due to the expansion of health tourism, wars, migrations, and ethnic conflicts, it is thought that this attitude will negatively affect the quality of patient care. Second, in our study, it was found that the married participants had higher mean AHS and AVWPHS scores than the single participants. Various studies have reported similar results (Demirel et al., 2019; Ne'eman-Haviv, 2021; Yeşilçiçek Çalık, 2018). On the other hand, there are also studies stating that marital status has no statistically significant relationship to attitudes toward honor and violence committed against women to protect honor (Kaya and Turan, 2018; Kızılırmak and Çakıcı, 2021). In the context of the relevant literature, it is seen that studies about honor-related perceptions regarding women and honor-related violence were performed generally in patriarchal cultures and particularly in Middle Eastern and Mediterranean countries where the majority of the population is Muslim (Hamzaoğlu and Konuralp, 2019). Considering the dominant effect of religion on cultural structures, it is known that a married woman is obliged to serve her spouse and show obedience and be faithful to him, these are her primary duties, and she is raised under this effect, especially in Muslim societies. Thus, it is thought that married men's attitudes toward honor and violence committed against women to protect honor are transformed into a phenomenon that could be based on a just cause and would even be sanctified on account of being upheld with the support of religious beliefs. The finding of our study that the married female students had highly positive attitudes toward honor and violence committed against women to protect honor showed the degree of influence of traditional beliefs which are dominant in the culture. Third, in this study, it was discerned that the participants from extended families had higher mean AHS and AVWPHS scores and exhibited more positive attitudes toward honor and violence committed against women to protect honor in comparison to the participants from nuclear families. While some studies have reported results similar to the result of this study (Aktaş, Ertuğ and Öztürk, 2015; Demirel et al., 2019; Ilic, 2016; Kaya and Turan, 2018), there are also studies stating that family type is not a variable affecting attitudes toward honor and violence committed against women to protect honor (Çaylan Çağlayan and Topatan, 2020; Kızılırmak and Çakıcı, 2021; Yeşilçiçek Çalık, 2018). The extended family structure is generally known to have had a larger effect on attitudes toward honor in traditionalist cultures. On the other hand, it is supposed that the differences in findings in the relevant literature have stemmed from whether students have developed a different perspective or an awareness outside the family culture in the context of their individual development processes. In our study, a statistically significant positive correlation was found between the AHS and AVWPHS scores of the participants, and the participants who had more positive attitudes towards honor also had more positive attitudes towards violence against women in the name of honor. According to the results of the simple linear regression analysis, attitude towards honor was a significant predictor of attitude towards violence against women in the name of honor. According to this result, it is thought that attitudes toward honor restrict women's rights and freedoms, and violence against women is justified in the name of honor.

CONCLUSION

In this study, it was discerned that nursing students exhibited moderately positive attitudes toward honor and violence committed against women to protect honor. Besides, it was found that the students who were male, those who were married, and those who had extended families had more positive attitudes toward honor and violence committed against women to protect honor. It is thought that there is a need for a systematic behavioral change in the perceptions of nursing students regarding gender, violence against women, and honor. It is also considered that courses and training programs aimed at this behavioral change should be integrated into the entire nursing curriculum to ensure the permanence of the behavioral change and raise awareness about it. Seeing the differences (if any) between university students in different regions may contribute to obtaining more meaningful results. For this reason, it is recommended that the research be conducted in larger populations with different nursing students.

Limitations and Strengths

This study was conducted Bursa Uludağ University Faculty of Health Sciences nursing students and cannot be generalized to all other nursing students. This study is striking in that it reports that nursing students have moderately positive attitudes towards violence committed in the name of honour. In addition, this study is also important in that it reports that nursing students need a serious behavioral change in their perceptions of gender, violence against women and honor. This study was conducted among nursing students of a university's health sciences faculty. A sample calculation was made in the research, but probability sampling methods were not used to determine the students to be sampled. A survey was sent to students online. Therefore, it is possible that the students who answered the survey were more sensitive to the issue. This situation constitutes the limitation of the research.

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The author reports that there are no competing interests to declare.

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Plan, design: CYK; **Material, methods and data collection:** CYK; **Data analysis and comments:** CYK; **Writing and corrections:** CYK.

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Determination of Professional Belonging Level and Affecting Factors in Student and Working Midwives

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ABSTRACT

Objective: The aim of the study was to determine the professional belonging of final year undergraduate midwifery students studying midwifery at universities in Turkey and undergraduate midwives actively working as midwives in the field in Turkey. **Materials and Method:** This descriptive and cross-sectional study was conducted between 17 January and 29 April 2022 with 174 final year undergraduate midwifery students studying at universities in Turkey and 171 undergraduate graduate midwives actively working as midwives in the field in Turkey. The data were collected through Google questionnaires using a descriptive information form including socio-demographic characteristics, views on midwifery profession and professional activity information and Midwifery Belonging Scale prepared by the researchers. **Results:** Of the participants, 50.43% were final year undergraduate students and 49.57% were working midwives. The mean age of midwifery students (n:174) was 22.48±1.36 and the mean age of working midwives (n:171) was 32.30±7.90. The mean total score of the student midwives from the midwifery belonging scale was 93.18±10.01 and 90.21±13.18 for the working midwives. While there was a statistical difference between the mean scores of the emotional belonging sub-dimension of the scale between student midwives and working midwives, there was no difference in the other sub-dimension mean scores. A statistical difference was found in the total and sub-dimension mean scores of the midwifery belonging scale between student and working midwives who willingly chose the midwifery department/profession, liked the midwifery department/profession, participated in certified education/congresses, and were members of associations ($p<0.05$). **Conclusion:** It was determined that the participants had high levels of professional belonging.

Keywords: Professional belonging, professional belonging level, student and working midwives.

Öğrenci ve Çalışan Ebelerde Mesleki Aidiyet Düzeyi ve Etkileyen Faktörlerin Belirlenmesi

ÖZ

Amaç: Araştırma, Türkiye'deki üniversitelerde ebelik öğrenimi gören lisans son sınıf öğrencileri ve Türkiye'de sahada ebe olarak aktif çalışan lisans mezunu ebelerin mesleki aidiyetinin belirlenmesi amacıyla yapılmıştır. **Gereç ve Yöntem:** Tanımlayıcı ve kesitsel tipte olan bu çalışma, 17 Ocak- 29 Nisan 2022 tarihleri arasında, Türkiye'deki üniversitelerde öğrenim görmekte olan 174 ebelik öğrenimi gören lisans son sınıf öğrencisi ve Türkiye'de sahada ebe olarak aktif çalışan 171 lisans mezunu ebe ile yürütülmüştür. Veriler, araştırmacılar tarafından hazırlanan sosyo-demografik özellikleri, ebelik mesleğine ilişkin görüşler ile mesleki faaliyet bilgilerini içeren tanıtıcı bilgi formu ve Ebelik Aidiyet Ölçeği kullanılarak Google anket formlar aracılığıyla toplanmıştır. **Bulgular:** Araştırmaya katılanların %50,43'ü lisans son sınıf öğrencisi, %49,57'si çalışan ebedir. Ebelik öğrencilerinin (n:174) yaş ortalaması 22,48±1.36 ve çalışan ebelerin (n:171) yaş ortalaması 32,30±7,90'dir. Öğrenci ebelerin ebelik aidiyet ölçeğinden aldıkları toplam puan ortalaması 93,18±10,01, çalışan ebelerin ise 90,21±13,18'dir. Ölçeğin duygusal aidiyet alt boyut puan ortalamalarının öğrenci ebeler ile çalışan ebeler arasında istatistiksel anlamda fark saptanırken, diğer alt boyut puan ortalamalarında fark saptanmamıştır. Ebelik bölümünü/mesleğini isteyerek seçenlerin, ebelik bölümünü/mesleğini seven, sertifikalı eğitim/kongrelere katılan, derneklere üye olan öğrenci ve çalışan ebelerin ebelik aidiyet ölçeği toplam ve alt boyut puan ortalamalarında istatistiksel anlamda fark bulunmuştur ($p<0.05$). **Sonuç:** Katılımcıların mesleki aidiyet düzeylerinin yüksek olduğu belirlenmiştir.

Anahtar Kelimeler: Mesleki aidiyet, mesleki aidiyet düzeyi, öğrenci ve çalışan ebeler

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INTRODUCTION

Belonging is defined as "relatedness, interest", which means a person's relationship with any emotion, thought, or place (TDK, 2022), and is one of the high-level needs that must be met in Maslow's hierarchy of the basic needs (Maslow, 1943; Baskaya, 2018).

A profession considered a part of belonging is one of an individual's essential identity characteristics (Yesilcelebi, 2014). The concepts of professional belonging or professional commitment define the psychological bond between the person and the profession (Lee et al., 2000; Baskaya, 2018), the place of the profession in the person's life (Baysal & Paksoy, 1999; Baskaya, 2018), the attitude of the person towards the profession (Blau, 2001; Baskaya, 2018), and the interest of the person towards the profession (Baskaya, 2018). Since the processes in professional life constitute an essential part of human life, the time spent directly affects work performance and success (Ozdevecioglu & Aktas, 2007; Baskaya, 2018). A strong sense of professional belonging increases job commitment, satisfaction, productivity, job satisfaction, identification, and happiness, enabling them to develop more positive professional feelings (Baskaya, 2018). Personality characteristics, education level, working and economic conditions, risk of accident and death, wage, job guarantee, team members, authority and responsibilities, material or moral rewards, professional status, social perspective, managerial attitude, career opportunities, participation in decisions and autonomy, and professional organization are the factors that affect professional belonging (Baskaya, 2018).

Midwifery is the oldest professional profession that has existed since the beginning of life, includes science and art, evidence-based practices, and is committed to ethical values (Arslan et al., 2008; Ocak Akturk et al., 2021). In the context of professional belonging, a midwife's professional belonging can be associated with fulfilling her professional responsibilities by loving her profession and, in light of scientific developments, being devoted to ethical values, self-sacrifice, and protecting her profession (Ocak Akturk et al., 2021). There are studies in the literature evaluating the professional belonging levels of working midwives and related factors. However, more studies need to evaluate the level of professional belonging during the student period, when the foundations of the profession were laid.

Considering that the professional commitment of midwives begins with the education process and strengthens during the midwifery profession, it is essential to determine the professional belonging of student midwives, like working midwives (Gumusdas et al., 2021). No study has been found in the literature comparing the working and student midwives' belonging levels. This study was planned as a descriptive cross-sectional and online type of research to determine the professional belonging of the undergraduate senior students studying midwifery at universities in Türkiye and the midwives with a bachelor's degree working actively as midwives in the field.

MATERIALS AND METHODS

Design and settings

The research was conducted as a descriptive, cross-sectional, and online survey study.

Recruitment and data collection

The universe of the study consists of the senior undergraduate students studying midwifery at universities in Türkiye and the midwives with bachelor's degrees working actively in Türkiye. Midwives are invited to participate in the study online using the random sampling method, which is one of the improbable sampling methods. The invitation included an information sheet explaining the study, assuring participants that participation was voluntary and anonymous, and a link to a consent sheet and the online survey. The surveys were prepared via Google Forms and were open from January 17 to April 29, 2022.

Sample size

The Raosoft sample size calculation program was used to calculate the study's sample size (http://www.raosoft.com/samplesize.html). Using the sample size formula of the unknown universe, it was determined that the study would reach a minimum of 163 senior undergraduate students and 163 working midwives (α=0.05, 1-β=0.80). While collecting data for the study, it was determined that six of the senior undergraduate participants did not fill out the forms completely. Thus, the study eventually reached 174 senior undergraduate students and 171 working midwives.

The inclusion criteria

The student midwives who have accepted to participate voluntarily in the study, have accessed the internet, and have answered the questionnaire completely must be actively registered in Turkiye in the 2021–2022 academic year. The working midwives must have a bachelor's degree and be active midwives at any private or public institution. All of these were determined to be inclusion criteria.

Survey instruments

The survey incorporated: This is an information form and a midwifery belonging scale. The details of the forms are given below:

The Introductory Information Form: It was developed by researchers based on the findings of the literature (Ocak Akturk et al., 2021; Gumusdas et al., 2021; Baskaya et al., 2020; Demirci et al., 2021). In the form, there are five general questions about country of residence, age, reason for choosing the profession, and appreciation of the midwifery profession. There are also 11 questions assessing the class of the students, the AGNO, the participation in the professional activities, the fields and the units to be studied in the future, and 11 questions assessing the working unit, the year, and the participation of the working midwives in the

professional activities. The total number of questions is 27.

Midwifery Belonging Scale (MBS): The Midwifery Belonging Scale, developed by Baskaya et al. in 2020, is a 5-point Likert-type scale comprising 22 items. The scale consists of four sub-dimensions: "emotional belonging," "fulfilling professional roles and responsibilities," "evaluating professional development and opportunities," and "limit of duty and authority in the profession." The lowest score obtained from the scale is 22, and the highest is 110. It is accepted that the higher the score obtained from the scale, the higher the sense of belonging. The Cronbach Alpha Coefficient of the scale was determined to be 0.90 (Baskaya, 2018; Baskaya et al., 2020). Written permission was obtained for the use of the MBS. The total alpha value of the scale for this study is 0.81.

Statistical analysis

For data analysis, IBM SPSS V23 (SPSS, Inc., Chicago, IL, USA) was used. The conformity of the data to the normal distribution was examined with the Kolmogro-Smirnow test. The descriptive statistics and the Chi-square were used to compare categorical data; the Mann-Whitney U test was used to compare the data with a normal distribution according to the groups; the Kruskall-Wallis test was used to compare the data without a normal distribution according to the groups; and the post-hoc Benferonni test was used for the further analysis. The analysis results were presented as mean ± s.d and median (minimum-maximum) for the quantitative data and as frequency and percentage for the categorical data. $p<0.05$ was considered to be statistically significant.

Ethical consideration

Approval for the study was obtained from Kırklareli University Clinical Research Ethics Committee (Date:28.12.2021, Approval no: E-69456409-199-35280/). All the procedures were performed by the rules regarding the studies involving human participants by considering the ethical standards of the institutional and national research committee and the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

RESULTS

The mean age of the midwifery students (n:174) participating in the study was 22.48±1.36, and the mean age of the working midwives (n:171) was 32.30±7.90. When the students and working midwives were examined in terms of their professional characteristics, it was determined that there was no statistically significant difference between the groups considering the midwifery profession as valuable, thinking that the midwifery profession was valued, and the reason for choosing the midwifery profession ($p=0.052$, $p=0.063$, $p=0.138$, Table 1).

Table 1. The comparison of the descriptive characteristics of the student and the working midwives.

Variables	Student Midwife (n=174)		Working Midwife (n=171)		Total (n=345)		Test/p
	X±SD		X±SD		X±SD		
Age	22.48±1.36		32.30±7.90		27.34±7.48		U=1390.00 p=0.000[a]
Considering the midwifery profession is valuable	9.52±1.09		8.96±2.24		9.24±1.78		U=23.160 p=0.052[a]
Thinking that the midwifery profession is valued	4.63±2.03		4.23±2.31		4.43±2.18		U=11.675 p=0.063[a]
	n	**%**	**n**	**%**	**n**	**%**	
Reason for choosing the midwifery profession/department							
Willingly and by researching	70	40.2	61	35.7	131	38.0	X^2 =8.352 p=0.138[b]
Family request	18	10.3	21	12.3	39	11.3	
Friend/close environment recommendation	18	10.3	9	5.3	27	7.8	
Having good job opportunities	41	23.6	37	21.6	78	22.6	
Being the department that the student's grades are enough for it	24	13.8	35	20.5	59	17.1	
Other	3	1.7	8	4.7	11	3.2	

[a] Mann Whitney U Test, [b]Ki Kare Test.

It has been determined that the area where 63.2% of the student midwives and 58.3% of the working midwives participating in the research want to work after graduation and are still working is affiliated with public hospitals; the unit where 58.6% of the student midwives want to work after graduation is the delivery room; and the unit where 53.2% of the working midwives work is FHC-CHC (Family Health Center-Community Health Center). It has also been determined that 42.5% of the student midwives and 78.4% of the working midwives attend certified

training or conferences; 82.8% of the student midwives and 69.0% of the working midwives do not take responsibility for administrative duties; and 74.7% of the student midwives and 56.6% of the working midwives are not members of associations. Groups differ regarding these characteristics (p=0.000, p=0.000, p=0.000, p=0.004, p=0.001, Table 2).

Table 2. The comparison of the student and the working midwives in terms of professional characteristics.

Variables	Student Midwife (n=174)		Working Midwife (n=171)		Test/p	
	n	%	n	%	n	
	Liking the midwifery profession/department					
Yes	161	92.5	150	87.7	311	X^2 =1.737
No	13	7.5	21	12.3	34	p=0.188[a]
	Wishing to change the midwifery profession/department					
Yes	30	17.2	41	24.0	71	X^2 =1.999
No	144	82.8	130	76.0	274	p=0.157[a]
Desired/worked in the field after graduation						
Freelance midwifery	11	6.3	5	2.9	16	
Academy	36	20.7	7	4.1	43	
Public hospitals	110	63.2	91	53.2	201	X^2 =56.988
Private hospitals	5	2.9	19	11.1	24	**p=0.000[a]**
In a non-midwifery field	7	4.0	13	7.6	20	
Other	5	2.9	36	21.1	41	
Desired/worked unit after graduation						
Delivery room	102	58.6	5	2.9	107	
Obstetrics-gynecology	15	8.6	7	4.1	22	
FHC-CHC	40	23	91	53.2	131	X^2=142.001
Other (internal medicine, surgical service, etc.)	7	4.0	19	11.1	26	**p=0.000[a]**
In an on-midwifery field	10	5.7	49	28.7	59	
Plan to take postgraduate education.						
Yes	121	69.5	110	64.3	231	X^2 =0.837
No	53	30.5	61	35.7	114	p=0.360[a]
Participation in certified education/congresses						
Yes	74	42.5	134	78.4	208	X^2 =44.771
No	100	57.5	37	21.6	137	**p=0.000[a]**
Taking responsibility for administrative tasks						
Yes	30	17.2	53	31.0	83	X^2 =8.191
No	144	82.8	118	69.0	262	**p=0.004[a]**
Being a member of associations						
Yes	44	25.3	72	43.4	116	X^2 =10.189
No	130	74.7	99	56.6	229	**p=0.001[a]**

When the comparison of the midwifery belonging scale sub-dimensions and the total score averages of the student and the working midwives was examined in Table 3, a statistically significant difference was found between the student and the working midwives, in terms of the average score of the emotional belonging sub-dimension (p=0.001). In the study, a statistically significant difference was found in terms of the total score of the midwifery belonging scale between the groups, the situation of liking the midwifery department or profession, not wanting to change the midwifery department or profession, planning to get a graduate education, getting a certified education or participating in congresses, taking responsibility for administrative duties, or being a member of associations (p=0.000, p=0.000, p=0.016, p=0.001, p=0.021). In addition, a statistically significant difference was found between the groups regarding the field and the unit where the student midwives wanted to work after graduation and the field and the unit where the working midwives were still working (p=0.011, p=0.000, Table 3).

In the study, it has been determined that the students and working midwives who express they love their profession, prefer their profession willingly and by

researching, do not think about changing their profession, participate in certified education or congresses, are members of associations, and plan to receive postgraduate education have obtained higher scores in the total and sub-dimensions of midwifery belonging ($p<0.05$). While it has been determined that among the student midwives who plan to work in fields and units related to midwifery, they have a higher level of midwifery belonging than those who plan to work in fields and units unrelated to midwifery, it has also been determined that the levels of belonging of the working midwives are not affected by the working field or unit ($p=0.011$, $p=0.399$). While the administrative duties of student midwives have not affected their level of belonging, it has been determined that there is a significant difference in the sub-dimensions of fulfilling professional roles and responsibilities, evaluating professional development and opportunities, and the mean total score of working midwives ($p=0.320$; $p=0.012$, $p=0.033$, $p=0.021$, Table 3).

Table 3. The analysis of the factors affecting the means of the midwifery belonging scale sub-dimensions and the total score.

Variables	Emotional belonging sub-dimension score		Sub-dimension score of belonging to fulfilling professional roles and responsibilities		Professional development and opportunities assessment sub-dimension score		Sub-dimension score of duty and authority limits in the profession		Total score of midwifery belonging scale	
	X±SD	Test value/p	X±SD	Test value/p	X±SD	Test value/p	X±SD	Test value/p	X±SD	Test value/p
Midwifery Status										
Student (S)	30.27±4.11	**p=0.001**[a]	31.04±3.11	p=0.550[a]	19.55±2.94	p=0.096[a]	12.31±2.35	p=0.126[a]	93.18±10.01	p=0.072[a]
Working (W)	28.14±5.79		30.66±3.66		18.87±3.66		12.53±2.69		90.21±13.18	
[a] İndependent samples t-test										

DISCUSSION

Professional belonging is an important concept that affects working individuals' attitudes, behaviors, and motivations toward business life (Keskin & Pakdemirli, 2016). In the study, when the reasons for choosing the profession of the midwifery students and the working midwives were examined, 40.2% of the midwifery students and 35.7% of the working midwives stated that they chose the profession voluntarily. When the literature is examined, it has been determined that the rate of choosing the midwifery profession voluntarily varies between %32.5%-81.5% (Gumusdas et al., 2021; Unlu et al., 2008; Pinar et al., 2013; Yildirim et al., 2014; Yucel et al., 2018; Demir & Taspinar, 2021; Ocak-Akturk et al., 2021; Unver et al., 2022). Compared to the literature, the relatively low rate in this study may be because the participants were presented with options, such as the fact that the profession has many job opportunities, and their grades are enough for this department under the same question. The study determined that those who chose their department voluntarily had a higher sense of professional belonging. In parallel with this, in the studies conducted with the midwives and the students in the literature, it has been determined that choosing the profession voluntarily affects professional belonging positively (Bilgic, 2022; Cevik & Alan, 2021; Ocak Akturk et al., 2021).

The study asked the students and the working midwives about their thoughts on liking and changing their profession. In total, 90.1% of the participants reported that they liked their profession, and 20.6% considered changing their profession, and no difference was found between the two groups. When the domestic literature was examined, the students and the working midwives stated that they liked the midwifery profession between the range of 60.3%-93.6% (Yucel et al., 2017; Ocak Akturk et al., 2021; Toker et al., 2020). The findings of our study are similar to those in the literature. Sullivan et al. (2011): In their study with 209 midwives in Australia, when the midwives were asked about their reasons for continuing the midwifery profession, it was determined that the first three reasons given were "I enjoy my job," "I am proud of being a midwife" and "I am satisfied with my job ."It has been reported that a small number of the groups thought to change jobs, but they continued their professions because they did not dare to do so (Sullivan et al., 2011). There are similar attitudes towards the profession at home and abroad. According to our study's results, more students and working midwives stated that they thought of changing their profession than those who did not like their profession. The reason for this may be that the working conditions of the profession are complex, it is open to malpractice lawsuits, and it is thought that it needs to be given more value. In a study conducted with the students in the literature, it was reported that 8% of the students were considering changing their profession (Demir & Taspinar, 2021), while in a study conducted with the midwives, 7% of the midwives were considering changing their profession (Ocak Akturk et al., 2021). As a result of the study (20.6%), there is a higher level of thinking about changing a profession than literature. The fact that the data of our study was collected in 2022 and that both the working midwives and the students who did internships and took the practical course during the pandemic process worked

under challenging conditions may have increased the tendency to change the profession. Another important finding of our study is that loving a profession increases professional belonging. In parallel with our study, it has been reported in the literature that the belonging scores of those who love their profession and consider it appropriate for themselves are high (Ocak Akturk et al., 2021; Bilgic, 2022; Cevik & Alan, 2021; Turan & Unver, 2021). Likewise, in a qualitative study conducted with focus group interviews with 63 midwives in the Democratic Republic of Congo, it was reported that liking the midwifery profession ensures staying at the workplace despite a challenging working environment and low professional status (Bogren et al., 2020).

The study determined that the student midwives (63.2%) planned to work in public hospitals after graduation, and the majority of the working midwives (53.2%) worked in public hospitals. The fact that the working midwives plan to work in units out of the field more than the student midwives is exciting data. The study plans studied in the literature, the plans to study, and the field study plans are proportionally compatible (Demir & Taspinar, 2021; Karaman et al., 2022; Ocak Akturk., 2021; Ugurlu & Karahan, 2020; Yucel et al., 2018). In this context, in our study, it has been determined that the place where the working midwives work in or out of the field does not affect their professional belonging ($p>0.05$). However, the fact that the student midwives plan to work in the field affects their professional belonging positively ($p<0.05$). In the literature, it has been reported that in the study of Bilgic (2022), the institution where the midwives work does not affect their professional belonging (Bilgic, 2022). However, in a study conducted with the students, the professional belonging of the students who wanted to work in the field of midwifery was found to be higher (Ocak Akturk., 2021).

In this study, it was determined that 42.5% of the student midwives and 78.4% of the working midwives attended certified education or conferences, and this increased the professional belonging of the working midwives and the student midwives. Bilgic (2022) reported that 93.7% of the midwives followed the new developments and that these midwives had higher levels of professional belonging (Bilgic, 2022). In addition, the Ocak Akturk study (2021) reported that 69.2% of the midwives participated in scientific activities. The fact that the students have up-to-date information compared to the working midwives, the requirement to graduate with a bachelor's degree for certified education, their low awareness about participating in congresses, and their limited income may explain their participation in less scientific activities.

Another important finding of our study is that being a member of an association and holding administrative duties positively affects professional belonging. No results related to this result were found in the literature. However, the fact that a member of the profession is a member of the association or takes part in an administrative task may show that the individual believes that the initiatives that will carry his or her profession forward and develop it can be done with professional autonomy and the current legal regulations. This can be seen as a factor that increases professional belonging.

The study determined that the total MBS score of the student midwives was 93.18±10.01, and that of the working midwives was 90.21±13.18, and no difference was found between the groups. When the domestic literature is examined, it has been reported that the average total score taken from the same scale is between 88 and 99 for the student midwives and 75 and 96 for the working midwives (Cevik & Alan, 2021; Ocak Akturk et al., 2021; Bilgic, 2022; Gumusdas et al., 2021; Turan & Unver, 2021; Unver et al., 2022). Although the findings of our study were similar to the literature, when the sub-dimension mean scores were examined, it was determined that the sub-dimension mean scores, which were taken from the scale of the student midwives and the working midwives who participated in our study, were similar to the literature and higher than the literature. In our study, the mean score of the emotional belonging sub-dimension was 30.27±4.11 in student midwives and 28.14±5.79 in working midwives, and a statistically significant difference was detected ($p<0.05$). In Çevik and Alan's (2021) study with 172 midwifery students, the mean score of the emotional sub-dimension was 26.65±5.79; in Bilgiç's (2022) study with 348 working midwives, it was 30.54±6.17 and Ünver et al. (2022) with 212 working midwives, it was reported to be 24.72±4.9 (Çevik & Alan, 2021; Bilgiç, 2022; Ünver et al., 2022). The findings of the studies are parallel to our research. It can be said that the study data collected during the pandemic continued to affect working midwives' emotional belonging negatively and created a statistical difference between them and student midwives. Although many factors, such as the period in which the study data are collected, the city, the university, and the variety of students or midwives constituting the study sample, change the professional belonging, it can be said that the belonging to the midwifery profession is high in our country. When the studies in the literature about the factors affecting professional belonging regarding the midwifery profession are evaluated, it has been reported that the use of ultrasound by midwives and the supportive and positive working environment affect professional belonging positively (Reiso et al., 2020; Honda et al., 2016).

Limitations and Strengths

This study's universe is limited to senior undergraduate students studying midwifery at universities in Türkiye and midwives with bachelor's degrees who are actively working in the field in Türkiye. The data obtained in the study are limited to the measurement tools used and the individual statements of the students and the working midwives participating.

CONCLUSION

According to the findings we obtained from our study, the professional belonging of the midwife candidates and the working midwives is relatively high. Although midwife candidates and working midwives consider the midwifery profession very valuable, this profession needs to be valued more by society. Working in areas where the midwife candidates and the working midwives can exhibit their independent roles, choosing the profession voluntarily, being open to professional development, being a member of an association, and taking charge in administrative positions are the factors affecting the professional belonging of midwives.

Suggestions

In this context, appropriate and positive practice areas should be created to increase the number of midwife candidates and establish positive relations with the working midwives who continue the profession. In addition, in order to increase the belonging of the working midwives, it can also be recommended to improve the working conditions and personal rights, offer training and career opportunities, implement supportive initiatives such as appreciation and reward, encourage their membership in associations, and employ them in field-specific units.

Conflicts of Interest

The authors declare no conflict of interest.

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Author Contributions

Plan, design: SK, AŞK; **Materials and Methods:** SK, SH; **Data analysis and interpretation:** AŞK, SK, SH; **Writing and corrections:** SK, SH, AŞK.

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Ethics Approval

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Examination of the Relationship between Mindfulness and Life Satisfaction in Society

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ABSTRACT

Objective: This study aimed to examine the relationship between mindfulness in society and quality of life. **Materials and Methods:** The data for this study were collected in July 2022 throughout Turkey through an online survey application using the snowball sampling method. The research was completed with 387 participants aged 18 and over in Turkey. The Independent Sample t-test, ANOVA, Mann-Whitney U, Kruskal-Wallis H, Bonferroni correction, and Spearman correlation coefficient were employed in the data analysis. **Results:** Participants in the 35-44 age range, those who were married, those with income more than expenses, those with postgraduate education, and those who reported being present in the moment were found to have higher levels of life satisfaction ($p<0.05$). A positive correlation was found between life satisfaction and mindfulness ($p=0.000$). **Conclusion:** The study results indicate that as the level of mindfulness increased, life satisfaction also increased. It may be suggested to provide opportunities for mindfulness-based practices by providing information about mindfulness in society, to plan research with different designs to determine life satisfaction and mindfulness, and to set policies to increase life satisfaction in society.

Keywords: Individual Differences, Life, Mindfulness, Satisfaction.

Toplumda Bilinçli Farkındalık ile Yaşam Doyumu Arasındaki İlişkinin İncelenmesi

ÖZ

Amaç: Bu çalışmanın amacı, toplumda bilinçli farkındalık ile yaşam kalitesi arasındaki ilişkiyi incelemektir**. Gereç ve Yöntem:** Bu çalışmanın verileri bir çevrimiçi anket uygulaması ile Temmuz 2022 tarihinde Türkiye genelinde ve kartopu yöntemi ile toplanmıştır. Araştırmada, Türkiye'de bulunan 18 yaş üstü 387 kişinin katılımı ile araştırma tamamlanmıştır. Verilerin analizinde; Independent "Sample-t", "ANOVA", "Mann-Whitney U", "Kruskal-Wallis H", "Bonferroni düzeltmesi" ve "Spearman" korelasyon katsayısı kullanılmıştır. **Bulgular:** Katılımcılardan, 35-44 yaş aralığında olanların, evli olanların, geliri giderinden fazla olanların, eğitim düzeyi lisansüstü olanların, anda hissedenlerin yaşam doyumu daha yüksek bulunmuştur ($p<0,05$). Yaşam doyumu ile bilinçli farkındalık arasında pozitif ilişki tespit edilmiştir ($p=0,000$). **Sonuç:** Bireylerin bilinçli farkındalık düzeyi arttıkça yaşam doyumunun arttığı görülmüştür. Toplumda bilinçli farkındalık hakkında bilgilendirmeler yapılarak bilinçli farkındalık temelli uygulamalar için olanak sağlanması, yaşam doyumu ve bilinçli farkındalığı belirlemeye yönelik farklı desenlerde araştırmaların planlanması, ayrıca toplumda yaşam doyumunu arttırmaya yönelik politikaların belirlenmesi önerilebilir.

Anahtar Kelimeler: Bireysel Farklılıklar, Yaşam, Farkındalık, Doyum.

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INTRODUCTION

Mindfulness has a history dating back around 2500 years, but it is only now gaining widespread recognition (Aktepe and Tolan, 2020). Its origin is the word "Sati" (memory), derived from the Pali language, and it was introduced into English by Rhys Davids in 1881 as "mindfulness". Kabat-Zinn (2003) defines mindfulness as "a state of awareness that occurs by paying attention knowingly and willingly, without judging the experience that occurs moment by moment in the present".

In a clinical setting, most mindfulness meditation-based interventions (MMBIs) are based on an approach initially introduced by Jon Kabat-Zinn and colleagues in 1979 through the "Mindfulness-Based Stress Reduction" (MBSR) program (Evans et al., 2008; Wielgosz et al., 2019), MBSR and its many derivatives, such as Mindfulness-Based Cognitive Therapy (MBCT), are used in a multitude of therapeutic contexts (Wielgosz et al., 2019).

Mindfulness and acceptance strategies target basic processes such as increased emotional awareness and regulation, cognitive flexibility, and goal-based behaviours (Hofmann and Gómez, 2017). Mindfulness-based interventions are suggested to be effective in reducing harmful health behaviours, accelerating chronic condition self-management and health behaviour change, and improving both physical and mental health outcomes (Schuman-Olivier et al., 2020).

Daily life challenges can negatively impact mental health and well-being, potentially reducing life satisfaction (Tachon et al., 2021). Life satisfaction is stated as a cognitive/judgmental process experienced by individuals and is defined as the general evaluation of individuals according to the criteria they choose when determining their quality of life (Dağlı and Baysal, 2016). It also relates to people's general cognitive evaluation of the quality of life and forms the concept of subjective well-being along with an emotional component (Doerwald et al., 2021). Life satisfaction and happiness tendencies may vary throughout the lifespan, with some individuals experiencing lower life satisfaction in youth or later adulthood, while others may have higher life satisfaction in young and older adulthood (An et al., 2020).

Life satisfaction is expressed as a desired goal, a happy life, and a fundamental human drive (Sekhon and Srivastava, 2021). With mindfulness, a factor that increases life satisfaction, individuals can become more competent in recognising and regulating their emotions, thereby coping with negative emotions and increasing life satisfaction (Parmaksız, 2020). This study is expected to contribute to a more understandable relationship between life satisfaction and mindfulness and reveal the effects of the variables. It is believed that mindfulness may also be a predictor in this regard, but since there is little literature supporting this, examining the relationship between these two variables will contribute to the literature.

MATERIALS AND METHODS

Study type

This study was designed and conducted in a descriptive-correlational research design to investigate the relationship between mindfulness in society and life satisfaction.

Study group

The research population covered 50,536,250 people over 18 years old in Turkey, based on data from the Turkish Statistical Institute (TÜİK). The sample size was determined using the known population sample calculation formula and set at 384 individuals. The study was completed with 387 participants. The preferred sampling method to reach the determined sample was "snowball sampling".

Inclusion criteria for the study were: i) being 18 years old or older, ii) having no perceptual, hearing, or visual problems that could hinder participation, and iii) having a device capable of participating in the study online.

Procedures

The data for the research were collected using the Personal Information Form, the Mindful Attention Awareness Scale, and the Life Satisfaction Scale.

Personal Information Form: It is an 11-question form prepared by researchers by reviewing the literature (Özyeşil et al., 2011; Güler and Usluca, 2021) and includes participants' sociodemographic characteristics and perceptions of mindfulness.

The Mindful Attention Awareness Scale (MAAS): It was developed by Brown and Ryan and adapted into Turkish by Özyeşil et al. (2011). The scale consists of a total of 15 items that measure the general tendency to be aware of and attentive to immediate experiences in daily life. MAAS has a single-factor structure, providing a total score. Scores on the scale range from 15 to 90, with higher scores indicating a higher level of mindfulness. In terms of validity, the analysis for internal consistency yielded a coefficient of 0.80, and the test-retest reliability coefficient was reported as 0.86 (Özyeşil et al., 2011). In this study, the Cronbach's Alpha value for the scale was found to be 0.861.

The Satisfaction with Life Scale (SLS): SLS was developed by Diener et al. (1985) and adapted into Turkish by Dağlı and Baysal (2016). It is a 5-item, 5-point Likert-type scale measuring satisfaction with life. Higher scores indicate higher life satisfaction. The Cronbach's Alpha internal consistency coefficient for the scale was reported as 0.88, and the test-retest reliability as 0.97 (Dağlı and Baysal, 2016). In this study, the Cronbach's Alpha value for the scale was found to be 0.876.

Statistical analysis

In the analysis of the data, Independent Sample-t and ANOVA were used for normally distributed data, and Mann-Whitney U, Kruskal-Wallis H, and Bonferroni correction were used for non-normally distributed data.

Spearman correlation coefficient was used to examine the relationships of two quantitative variables that do not have a normal distribution.

Ethical considerations

The research adheres to the principles of the Helsinki Declaration. Ethical approval for the study was obtained from the Halic University Non-Interventional Clinical Research Ethics Committee in Istanbul (Date: 29.06.2022, Approval No: 156). Each participant became involved in the study after reading the informed consent form and providing online consent through the link sent to them.

RESULTS

Participants' mean age was 35.33±11.48 (years), with 28.4% falling into the 35-44 age group, 67.4% were women, and 52.2% were married, 45% had income equal to their expenses, and 57.6% were university graduates, 48.3% lived in the Marmara Region, 70.8% (n=274) of them felt in the present moment, 68.2% were not satisfied with life, and 75.5% did not have any chronic condition (Table 1).

A significant difference was found between the Satisfaction with Life Scale and age ($\chi2$=8.942; p=0.030), marital status (Z=-4.170; p=0.000), income level ($\chi2$=77.895; p=0.000), education level ($\chi2$=19.344; p=0.000) (Table 2).

A significant difference was found between the Mindful Attention Awareness Scale and income level ($\chi2$=6.613; p=0.037) (Table 2).

SLS scores of those who felt present in the moment (p=0.000) and who were satisfied with life (p=0.000) were higher (Table 3).

MAAS scores of those who felt present in the moment (p=0.000) and who were satisfied with life (p=0.000) were higher (Table 3).

Table 1. Distribution of findings regarding participant characteristics (n=387).

Variables		**n**	**%**
Age groups	<25	86	22.2
	25-34	104	26.9
	35-44	110	28.4
	≥45	87	22.5
Gender	Female	261	67.4
	Male	126	32.6
Marital status	Married	202	52.2
	Single	185	47.8
Income level	Income equals to expenses	174	45.0
	Income is more than expenses	92	23.7
	Income is less than expenses	121	31.3
Education	Primary education	21	5.4
	High school	69	17.9
	University	223	57.6
	Postgraduate	74	19.1
Lived region	Mediterranean	22	5.7
	Eastern Anatolia	20	5.2
	Aegean	18	4.7
	Southeastern Anatolia	9	2.3
	Central Anatolia	111	28.6
	Black Sea	20	5.2
	Marmara	187	48.3
Having moments that can only be felt in the present moment	Yes	274	70.8
	No	113	29.2
Feeling satisfied with life	Yes	123	31.8
	No	264	68.2
Having a chronic condition	Yes	95	24.5
	No	292	75.5

Table 2. Comparison of scale scores according to sociodemographic findings.

Variable	n	SLS		MAAS	
		$\bar{X} \pm S.D.$	Median [IQR]	$\bar{X} \pm S.D.$	Median [IQR]
Age groups					
<25 (1)	86	12.45±4.18	12.0 [6.3]	53.86±11.61	51.0 [18.0]
25-34 (2)	104	13.38±4.50	14.0 [5.8]	55.52±13.69	57.5 [19.5]
35-44 (3)	110	14.15±4.12	15.0 [6.0]	58.27±11.88	57.0 [18.0]
≥45 (4)	87	12.86±4.45	14.0 [7.0]	57.09±12.17	58.0 [17.0]
Statistical analysis*		χ^2=8.942		χ^2=6.881	
Probability		**p=0.030**		p=0.076	
Difference		**[1-3]**			
Gender					
Female	261	13.49±4.29	14.0 [6.0]	56.19±12.27	56.0 [18.0]
Male	126	12.81±4.42	13.0 [6.3]	56.48±12.90	57.5 [18.0]
Statistical analysis		Z=-1.222		t=-0.210	
Probability		p=0.222		p=0.834	
Marital status					
Married	202	14.15±4.21	15.0 [6.0]	57.24±12.52	57.0 [18.0]
Single	185	12.31±4.30	12.0 [7.0]	55.24±12.34	55.0 [17.0]
Statistical analysis		Z=-4.170		Z=-1.424	
Probability		**p=0.000**		p=0.154	
Income level					
Income equals to expenses (1)	174	13.98±3.90	15.0 [5.0]	56.56±11.96	57.5 [16.3]
Income is more than expenses (2)	92	15.54±4.09	16.0 [4.8]	58.61±12.56	58.0 [19.0]
Income is less than expenses (3)	121	10.53±3.72	10.0 [7.0]	54.12±12.83	53.0 [18.5]
Statistical analysis		χ^2=77.895		χ^2=6.613	
Probability		**p=0.000**		**p=0.037**	
Difference		**[1,2-3] [1-2]**		**[2-3]**	
Education					
Primary education (1)	21	10.90±3.13	11.0 [5.0]	56.71±14.84	50.0 [24.0]
High school (2)	69	12.43±5.09	13.0 [7.5]	56.36±12.11	57.0 [15.5]
University (3)	223	13.21±4.10	14.0 [6.0]	56.38±12.53	57.0 [18.0]
Postgraduate (4)	74	14.92±4.09	15.0 [5.3]	55.79±12.10	56.0 [16.0]
Statistical analysis		χ^2=19.344		F=0.051	
Probability		**p=0.000**		p=0.985	
Difference		**[1,2,3-4] [1-3]**			

"Independent Sample-t" test (t-table value, "ANOVA" test (F-table value), "Mann-Whitney U" test (Z-table value), "Kruskal-Wallis H" test (χ2-table value)

Table 3. Comparison of scale scores according to personal characteristics.

Variable	n	SLS		MAAS	
		$\bar{X} \pm S.D.$	Median [IQR]	$\bar{X} \pm S.D.$	Median [IQR]
Lived region					
Mediterranean	22	12.00±4.08	13.0 [5.8]	53.86±11.99	54.5 [22.5]
Eastern Anatolia	20	12.20±3.50	11.5 [5.8]	52.60±11.67	50.5 [9.5]
Aegean	18	14.22±5.25	14.0 [8.0]	55.94±12.11	55.0 [16.0]
Southeastern Anatolia	9	14.33±5.93	16.0 [9.0]	51.78±14.43	51.0 [19.5]
Central Anatolia	111	13.52±4.33	14.0 [7.0]	56.73±12.95	58.0 [19.0]
Black Sea	20	12.80±4.71	12.0 [7.8]	53.90±14.02	52.5 [19.8]
Marmara	187	13.30±4.25	14.0 [6.0]	57.20±12.12	57.0 [17.0]
Statistical analysis		χ^2=5.572		F=0.942	
Probability		p=0.473		p=0.464	
Moments that can only be felt in the present moment					
Yes	274	14.09±4.27	15.0 [6.0]	57.79±12.37	59.0 [19.0]
No	113	11.27±3.85	11.0 [6.0]	52.62±11.96	51.0 [15.5]
Statistical analysis		Z=-5.858		t=3.769	
Probability		**p=0.000**		**p=0.000**	
Feeling satisfied with life					
Yes	123	16.26±3.06	16.0 [3.0]	60.33±12.49	60.0 [19.0]
No	264	11.88±4.15	12.0 [6.0]	54.40±12.01	54.0 [18.0]
Statistical analysis		Z=-9.482		t=4.459	
Probability		**p=0.000**		**p=0.000**	
Having a chronic condition	95	12.61±4.29	13.0 [7.0]	55.23±11.86	57.0 [17.0]
Yes	292	13.49±4.34	14.0 [5.0]	56.63±12.65	56.0 [18.0]
No					
Statistical analysis		Z=-1.761		t=-0.948	
Probability		p=0.078		p=0.344	

** "Independent Sample-t" test (t-table value, "ANOVA" test (F-table value), "Mann-Whitney U" test (Z-table value), "Kruskal-Wallis H" test (χ2-table value)*

Participants' mean SLS score was 13.27±4.34, and the mean MAAS score was 56.28±12.46 (Table 4).

Table 4. Distribution of scale scores.

Scale	Mean	S.D.	Median	Min.	Max.
The Satisfaction with Life Scale	13.27	4.34	14.0	5.0	24.0
The Mindful Attention Awareness Scale	56.28	12.46	56.0	21.0	88.0

A positive, weak, and statistically significant relationship was detected between SLS and MAAS (r=0.251; p=0.000). SLS scores increased as MAAS scores increased (Table 5).

Table 5. Examining the relationships between scales.

Correlation* (n=387)		The Satisfaction with Life Scale
The Mindful Attention Awareness Scale	r	0.251
	p	**0.000**

* In examining the relationship between two quantitative variables that do not follow a normal distribution, the "Spearman" correlation coefficient is used.

DISCUSSION

The study found higher life satisfaction and mindfulness scores in the 35-44 age group. In a study by Güler and Usluca (2021), life satisfaction and mindfulness scores were also higher in individuals aged 40 and above, similar to this study. A study by Milovanska-Farrington and Farrington (2022) suggested that satisfaction in different areas of life for each age group affects overall life satisfaction. Cheung and Lau (2021) also noted a positive relationship between age and life satisfaction. It appears that individuals become more effective in looking at life differently and evaluating moments as they age.

In this study, female participants had higher life satisfaction scores, while males had higher mindfulness scores. Studies conducted by Cheung and Lau (2021), and Parmaksız (2020) also indicated higher life satisfaction scores for female participants. Similarly, the study by Güler and Usluca (2021) found that female participants had higher life satisfaction, while males had higher mindfulness scores, and the study conducted by Wen et al. (2022) found higher mindfulness levels for women. It is suggested that life satisfaction in women is influenced more by factors such as social relationships, marital happiness, and satisfaction from the work environment rather than economic factors (Soylu and Kabasakal, 2016).

In this study, married participants had higher life satisfaction and mindfulness scores. Similarly, a study by Güler and Usluca (2021) reported higher life satisfaction and mindfulness scores for married participants. Another study by Parmaksız (2020) indicated that married participants had higher life satisfaction. Psychological well-being is considered essential for healthy romantic relationships, and mindfulness contributing to psychological well-being is positively associated with various potential "personal resources," including positive affect, self-esteem, and life satisfaction, which are crucial for healthy relationships (Barnes et al., 2007).

In this study, participants with higher income than expenses had significantly higher scores in both SLS and MAAS. Research conducted by Sugiura and Sugiura (2018) as well as Kim and Chung (2021) suggests that life satisfaction tends to rise with an increase in income. The study conducted by Yıkılmaz and Demir Güdül (2015) with university students found that students perceiving their socioeconomic status as either moderate or high had lower life satisfaction scores. Having money allows for increased consumption, leading to higher levels of joy and a reduction in negative experiences, and higher income provides the opportunity to purchase a higher standard of living and comfortable products and can also enhance life satisfaction through social comparison (Sugiura and Sugiura, 2018). However, in cases of excessive income growth, life satisfaction may not increase at the same rate once a certain "income satisfaction point" is reached (Kim and Chung, 2021).

This study found that life satisfaction was higher in participants with a postgraduate education, and mindfulness was higher in participants with a primary education. In the study conducted by Güler and Usluca (2021), life satisfaction was reported to be higher in participants with a primary education level, while mindfulness was higher in those with an undergraduate education level. In the study by Parmaksız (2020), individuals with primary education and below had higher life satisfaction. Life satisfaction varies among individuals and is linked to a combination of factors including personality structure, external changes in life conditions, and coping mechanisms (Şahin, 2019).

In this study, life satisfaction and mindfulness scores were statistically significantly higher in those who reported feeling present in the moment and satisfied with life. The survey conducted by Ballabrera et al. (2022) indicated that people who tend to focus on the present have higher life satisfaction. It is mentioned that mindfulness enhances wisdom and resilience, which in turn contributes to increased life satisfaction (Kütük et al., 2022). Studies suggest that mindfulness can be developed through training and practice or may be an inherent psychological resource in an individual (Ramaci et al., 2020) and that life satisfaction is a component of subjective well-being or happiness that reflects a cognitive evaluation of one's life, being generally dependent on how well one's needs have been met in the past and often based on an anticipation of how satisfied one will be in the future (Hartstone and Medvedev, 2021; Dirzyte et al., 2022).

This study identified a positively weak and statistically significant relationship between SLS and MAAS. A survey by Yıkılmaz and Demir Güdül (2015) reported a low-level positive relationship between life satisfaction and mindfulness, and the study by Güler and Usluca (2021) found a moderate and positive relationship. The study conducted by Şahin (2019) with university students showed a positive and significant relationship. Another study by Li et al. (2022) expressed that mindfulness directly and significantly influences life satisfaction. It is suggested that mindfulness can positively influence individuals by enhancing feelings of gratitude through the enjoyment of looking ahead, making the most of good times, remembering happy moments, and savouring the present moment18. Mindfulness interventions, while promoting mental health and well-being, may also lead to a reduction in various psychopathological symptoms (Brown et al., 2007). It is pointed out that mindfulness actually affects the mental health of individuals by regulating emotional balance to a large extent, that is, by reducing negative affect instead of increasing positive affect, thus contributing to better life satisfaction (Li et al., 2022).

Limitations and Strengths
The answers given cannot be generalized to the entire society. Due to the use of online methods to reach individuals participating in the research, individuals were required to have a device such as a computer or a smartphone to answer the survey online to participate in the research. The requirement for respondents to answer the study using these devices and the difficulty in adaptation due to advanced age were among the limitations of this study. Another limitation is the inability to communicate face-to-face with the participants while surveys are being answered.

CONCLUSION
The study demonstrated that while a significant proportion of participants reported feeling present, more than half of them expressed not being satisfied with life. As individuals' levels of mindfulness increased, life satisfaction also increased. It is recommended to consider variables related to mindfulness and life satisfaction when planning relevant interventions. It may be suggested to provide opportunities for mindfulness-based practices by providing information about mindfulness in society, to plan research with different designs to determine life satisfaction and mindfulness, and to define policies to increase life satisfaction in society.

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Conflict of interest
The authors declare that there are no conflict of interests.

Author contributions
Plan, design: GK, EU; **Material, methods and data collection:** GK, EU; **Data analysis and comments:** GK, EU; **Writing and corrections:** GK, EU.

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Epidemiological Investigation of Patients Admitted to the Emergency Department and Considered as Psychiatric Emergencies

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ABSTRACT

Objective: Today, 3-12% of patients presenting to the emergency department (ED) are diagnosed with a preliminary psychiatric diagnosis. Therefore, physicians working in the ED should know psychiatric diseases well and should be able to plan the correct treatment algorithms. In this study, it is aimed to evaluate the sociodemographic, etiological and epidemiological status of patients with a prediagnosis of psychiatric illness in the emergency department. **Materials and Methods:** Prospectively, patients over 18 years of age who received a psychiatric diagnosis in the emergency department between 16.10.2015-16.01.2016 were included in the study. Demographic information, complaints at presentation, psychiatric/physical examination findings, medical history, current diagnoses, preliminary diagnoses in the ED, laboratory and radiological examinations, hospitalization, discharge, mortality/morbidity were statistically evaluated. **Results:** There were 727 patients who met the study criteria, but 500 patients were analyzed. Psychotic (68%), depressive (9.8%), suicidal (7.6%) and manic (6.6%) findings at the time of admission were determined respectively. The rate of hospitalization was 12.6% and 20.6% of the patients were hospitalized against their will. **Conclusion:** Our study suggests that being young-middle-aged and female may be risk factors for both admission to EDs and hospitalization in psychiatric emergencies. Considering the intensity and workload of Emergency Departments, it is seen that they have a critical importance in terms of assessing the mental health needs of patients as well as dealing with the physical health problems of patients.
Keywords: Emergency Departments, Psychiatric, Emergency Medicine.

Acil Servise Başvuran ve Psikiyatrik Acil Durum Olarak Değerlendirilen Hastaların Epidemiyolojik İncelenmesi

ÖZ

Amaç: Günümüzde acil servise (AS) başvuran hastaların %3-12 sine psikiyatrik bir ön tanı konulmaktadır. Bu nedenle AS' de çalışan hekimler psikiyatrik hastalıkları iyi bilmeli ve doğru tedavi algoritmalarını planlayabilmeleri gerekmektedir. Bu çalışmada acil serviste psikiyatrik ön tanı alan hastaların sosyodemografik, etyolojik, epidemiyolojik durumlarını değerlendirmek amaçlanmıştır. **Gereç ve Yöntem:** Prospektif olarak 16.10.2015-16.01.2016 tarihleri arasında acil servisde psikiyatrik tanı alan 18 yaş üstü hastalar çalışmaya alınmış. Hastaların demografik bilgileri, başvuru şikayetleri, psikiyatrik/fizik muayene bulguları, tıbbi öyküleri, mevcut tanıları, AS' de aldıkları ön tanılar, laboratuvar ve radyolojik tetkikleri, hastaneye yatış, taburculuk, mortalite/morbidite gibi sonlanma durumları istatistiksel olarak değerlendirilmiştir. **Bulgular:** Çalışma kriterlerini karşılayan 727 hasta tespit edilmiş, ancak 500 hasta üzerinden analiz yapılmıştır. Hastaların başvuru sırasındaki bulguları sırasıyla; psikotik bulgularla (%68), depresif bulgular %9,8, suisidal bulgular %7,6 ve manik bulgular %6,6 olarak saptandı. Çalışmada hastaların hastaneye yatışı oranı %12,6 olduğu ve %20,6'sının yatışının ise kendi isteği dışında olduğu saptandı. **Sonuç:** Çalışmamızda Psikiyatrik acillerde, genç-orta yaş ve kadın olmanın hem AS'lere başvuruda hem de hastaneye yatışta risk faktörü olabileceğini düşündürmektedir. Acil Servislerin yoğunluğu ve iş yükü de göz önünde bulundurularak, hastaların fiziksel sağlık sorunlarıyla ilgilenmesinin yanı sıra hastaların ruh sağlığı ihtiyaçlarını değerlendirmek açısından da kritik bir öneme sahip olduğu görülmektedir.
Anahtar Kelimeler: Acil Servisler, Psikiyatrik, Acil Tıp.

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INTRODUCTION

Psychiatric emergencies may generally arise from mental illnesses or adverse life events but may also be due to organic causes such as poisoning, substance abuse, drug side effects and drug-drug interactions (Yıldız et al. 2003). Currently, a prediagnosis of psychiatric illness is made in 3-12% of patients presenting to the emergency department (ED) (Saddock, 2007). Therefore, physicians working in the ED should know psychiatric diseases well and should be able to plan the correct treatment algorithms.

At this stage, the most important task of emergency physicians is to determine the etiology of crises leading to urgency in the management of psychiatric emergency patients. Psychiatric emergency services ensure that patients are saved with the least loss in a limited time, with effective measures, rapid and accurate guidance (Bekaroğlu and Bilici, 1998). The main aim in the initial evaluation of the emergency psychiatric patient should be to prevent harm to the patient and other people, to question the patient's psychiatric and medical history, to evaluate the information such as psychoactive substance use in a short time, to distinguish cognitive disorders related to the general medical condition and to recognize a possible prepsychotic state. Although physical and neurological examination are important parts of psychiatric evaluation, laboratory investigations appropriate for the patient's condition must be performed (Arkonac, 1989).

Although emergencies with psychiatric indications are as common as neurological or traumatological emergencies, most emergency physicians do not feel qualified or experienced enough to treat them. Therefore, physicians have to make decisions with a small amount of information (Saddock, 2007). In psychiatric emergencies, obtaining information about the patient is difficult for emergency physicians because of limited time (Blais et al 2003). A good knowledge of the principles of development of emergency psychiatry, intervention techniques in emergency psychiatric patients and the approach to emergency psychiatric diseases is useful in making this decision (Gerson and Bassuk, 1980).

The aim of this study was to evaluate the sociodemographic, etiological and epidemiological status of patients with a preliminary psychiatric diagnosis in the emergency department.

MATERIAL AND METHODS

Study type

The prospective study was conducted between 16.10.2015 and 16.01.2016 and included patients over the age of 18 who were diagnosed with psychiatric illness as a result of physical examination and investigations performed by the primary physician of the emergency department. Patients under 18 years of age, pregnant women, and patients admitted due to trauma were excluded from the study.

Procedure

After obtaining the patient's consent, demographic information, complaints at admission, psychiatric/physical examination findings, medical history, current diagnoses, preliminary diagnoses of AS, laboratory and radiological examinations, hospitalization, discharge, mortality/morbidity, and end points were recorded on the Uludağ University hospital information management system.

The data used were classified according to DSM-IV-TR (The Diagnostic and Statistical Manual of Mental Disorders) axis diagnoses for statistical classification.

Statistical analysis

SPSS (Statistical Package for the Social Sciences) version 22.0 package program was used for statistical analysis of the data in the study. Kolmogorov-Smirnov test and Shapiro-Wilk test were used to assess the conformity of the univariate data to normal distribution. Descriptive statistical values were used in line with the characteristics of the variables in the study.

Ethical considerations

The study was initiated after the ethics committee decision dated 13 October 2015 and numbered 2015-17/25 by Uludağ University Faculty of Medicine Clinical Research Ethics Committee.

RESULTS

During the study period, 31700 patients applied to the emergency department. A total of 727 patients who met the study criteria were identified. 209 of these patients did not accept to participate in the study and 18 of them left the form unfinished during the form filling. Therefore, 500 patients were analyzed (Figure 1).

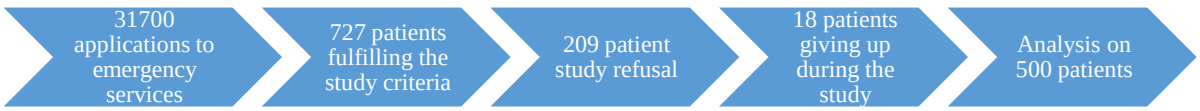

Figure 1. Study design

The mean age of the patients was 46.2 years (min. 18; max. 78), 69% were female and 55.8% were married (Table 1). When the educational status of the patients was analysed, 45% were university graduates and 1.8% were illiterate. 47.4% of the patients were employed and 92.6% had social security (Table 2).

Table 1. Age, gender and marital status distribution of patients.

		Number	Percentage
Age (Year)	18-45	395	79.0
	46-65	87	17.4
	>65	18	3.6
Gender	Male	155	31.0
	Woman	345	69.0
Marital Status	Married	279	55.8
	Single	197	39.4
	Other	24	4.8

Table 2. Education, occupation and social security status of the patients.

		Number	Percentage
Education Status	**Illiterate**	9	1.8
	Primary School	56	11.2
	Secondary School	42	8.4
	High School	168	33.6
	University	225	45.0
Profession	**Not working**	178	35.6
	Working	237	47.4
	Student	85	17.0
Social Security	**Paid**	31	6.2
	Green Card	6	1.2
	Other	463	92.6

While 51.2% of the patients included in the study had a history of psychiatric illness, 66.8% of the patients had alcohol or substance use and 51.2% had smoking habit.

Among the patients who participated in the study, those with axis diagnosis were 56.4%. Among the patients with axis diagnosis, those with psychotic disorder were 20%, those with personality disorder were 16.6% and those with bipolar disorder were 9.4% (Table 3).

There was no suicidal ideation or attempt in 90.8% of the patients. The proportion of patients with suicidal ideation without suicide attempt was 2.4%, 4.8% with one attempt and 2% with multiple attempts (Table 4)

When the findings of the patients at the time of admission were analyzed, it was observed that most of the patients presented with psychotic symptoms (68%), depressive symptoms were 9.8%, suicidal symptoms were 7.6% and manic symptoms were 6.6%.

In the study, the rate of hospitalization was found to be 12.6%. It was found that 20.6% of the hospitalizations were involuntary and 85.7% of the hospitalizations were made to the psychiatry clinic.

According to the evaluation according to the indications for hospitalization, hospitalizations for diagnosis and treatment ranked first with 46%, followed by suicide risk (36.5%) and metabolic reasons (11.1%). It was observed that 31% of the hospitalizations were made to Uludag University Faculty of Medicine Hospital and the remaining 69% were referred to other hospitals for hospitalization.

Table 3. Distribution of patients according to axis diagnoses.

		Number	Percentage
Axis Diagnosis	**None**	218	43.6
	There is	282	56.4
Diagnosis	**Depression**	37	7.4
	Bipolar Disorder	47	9.4
	Psychotic Disorder	100	20.0
	Substance Use	11	2.2
	Personality Disorder	83	16.6
	Other	4	0.8

Table 4. Distribution of patients according to suicidal ideation and attempts.

		Number	Percentage
Suicidal ideation	**None**	454	90.8
	There is	12	2.4
Number of suicide attempts	**One time attempt**	24	4.8
	Multiple initiatives	10	2.0

DISCUSSION

It is known that psychiatric problems are much more common in the society than thought. For this reason, psychiatric problems have an important place among the patients admitted to ASs and an increase in emergency admissions has been observed in recent years. It is thought that the increase in the rate of violence in societies and the increase in alcohol and substance use increase these applications (Gelisen, 1996). In addition, the realization that there may be mental changes secondary to many physical diseases has also increased people's applications to emergencies for psychiatric reasons.

In our study, it was found that female patients presenting to the emergency department were more frequent than male patients (Table 1). In some studies, different results have been obtained in the sense that gender affected the presentation, male patients presented more in some studies and female patients presented more in others (Saddock, 2007). In a retrospective study conducted in our country, it was reported that gender had no effect on presentation (Bekaroğlu and Bilici, 1998). In a study conducted by Costanza et al. in 2020, it was observed that female patients presented more frequently than male patients, similar to our study (Costanza et al. 2010).

In our study, 79% of the patients were found to be in the young-middle age range (18-45 years), which is similar to other studies (Table 1). The World Health Organization (WHO) has also revised age standards, defining young age as 25-44, middle age as 44-60, elderly age as 60-75, senile age as 75-90, and long-livers as individuals over 90. The young-middle age range is a period in which individuals are active in life and are more frequently confronted with vital stresses such as career choice, marriage, divorce, having children and so on (Skodal and Karasu, 1978). It may be considered that being mostly female and being in young-middle age may be a risk factor for admission and hospitalization to ASs. It may also be explained by the fact that psychiatric diseases are most frequently observed in these age groups (Bahçeci et al., 2011).

Consistent with the literature, 52.6% of our patients were housewives and unemployed patients such as students. In addition to the periodic stresses brought about by being a student, being a housewife or unemployed is also among the groups carrying risk factors for short hospitalization (Skodal, Karasu, 1978). Slankamenac et al. 2020, it was found that not having a profession may be a reason for psychiatric emergency admissions (Prediction of Recurrent Emergency Department Visits in Patients with Mental Disorders 2020).

In our study, 55.8% of the cases were found to be married, 39.4% single and 4.8% other. Although the divorce rate in our country has increased in recent years, it is still lower compared to other countries (Yılmaz, 1999). When the socio-cultural characteristics of our country are considered, this situation can be explained as the endeavor of individuals to maintain their marriages.

It was observed that 45% of the patients in our study were university graduates. According to Küçükali et al. 2015, it was found that 48% were primary school graduates, 21% were secondary school graduates, 18% were high school graduates, 7% were university graduates, and 6% were illiterate (Küçükali et al., 2015). Although the majority of the population in our country is composed of primary school graduates, the fact that the patients who applied to our hospital were generally at a high educational level in our study can be explained by the easy accessibility of the young and student population due to the location of our hospital in the university campus.

In our study, it was found that 92.6% of the hospitalized patients had health insurance, 6.2% were paid patients and 1.2% were green card patients. In a study conducted by Liebermann et al. in 1986, it was found that 68.3% had health insurance, 18.2% were paid patients and 13% were green card patients (Liebermann and Strauss, 1986).

In our study, psychotic symptoms were the most common complaints with 66.8%, followed by depressive and suicidal symptoms with 9.8% and 7.6%, respectively. According to Antoon et al. 2000, depressive symptoms (45.7%), suicidal symptoms (39.9%) and psychotic symptoms (30.5%) were the most common complaints of the patients who consulted a physician, similar to our study (Antoon et al., 2010). However, in a study conducted in Turkiye, the rate of psychoactive substance use was found to be 26.3% among the patients admitted to the psychiatry emergency department, while the most common diagnoses were conversion disorder (10.8%), generalized anxiety disorder (3.5%), conduct disorder (3.5%) and panic disorder (3.3%) (Küçükali et al., 2015).

The rate of substance use in our patients was 2.6% and the rate of both alcohol and substance use was 0.6%. In a study conducted in Turkiye, it was found that 9.3% of the patients used cannabis, 5.4% used alcohol and 12.6% used amphetamine, thinner, cocaine and opiates (Küçükali et al., 2015).

In a study conducted in the USA, alcohol and substance use was found to be 26% (Amy et al., 2011). In our study, the fact that the patients hid their substance use and the tests that would show substance use could not be performed in our hospital may have caused this rate to be low. In a study, while 55% of patients with Axis diagnosis had alcohol use, the rate of substance use was found to be 7% and the rate of both alcohol and substance use was found to be 5% (Liebermann and Strauss, 1986). There are studies showing that substance use accompanying a psychiatric disease is one of the negative prognostic factors and is related with frequent relapses and hospitalizations (Güz and Doğanay 2003). Similarly, it has been shown that comorbid diagnoses of alcohol and substance use are the two diagnoses that impair compliance with treatment the most (American Psychiatric Association, 1994).

In our study, it was found that 20.6% of the hospitalized patients were hospitalized without their own consent (involuntary). In the study conducted by Gültekin et al. 86.9% of the hospitalized patients were hospitalized voluntarily and 13.1% were hospitalized involuntarily and it was found that the most common necessity in the hospitalization decision of involuntarily hospitalized patients was the need for treatment due to dangerousness for oneself and the environment and/or non-compliance with their treatments (Gültekin, Çelik, Tihan, Beşkardeş and Sezer, 2013). In a study conducted by Belli et al. in 2010, the presence of violent behaviour in psychiatric patients was found to be an important criterion for involuntary hospitalization (Belli, Özçetin and Ertem, 2007). In another similar study, it was reported that aggression was an important marker especially in involuntary hospitalizations and this behaviour prolonged the duration of hospitalization (Uzun, 2009).

While 91% of the patients included in our study stated that they had neither suicidal ideation nor any suicide attempt, the rate of those with suicidal ideation was 2%, the rate of those with one suicide attempt was 5%, and the rate of those with multiple attempts was 2%. In a study, it was reported that suicidal ideation was effective for the decision of emergency hospitalization (American Psychiatric Association, Washington DC, 1994.). In addition, studies emphasizing the difference between suicidal ideation and suicide attempt and emphasizing that these two cases should be evaluated separately were also found (Meltzer, 2022).

Although our study has some limitations, all information was obtained from retrospective analyses and subsequent telephone interviews in patients for whom adequate anamnesis could not be obtained. One of the important limitations is that some of the data were obtained not from the patients themselves, but from their relatives, so the accuracy of the information is not clear. Another limitation is that detailed anamnesis could not be obtained from the patients with acute psychosis due to their aggressive and impulsive behaviours.

CONCLUSION

In conclusion, emergency psychiatric conditions pose a threat to patients and their relatives and require urgent intervention. Suicide attempt, substance addiction, alcohol intoxication, acute psychotic states, aggression, panic attacks and conversion are the most common psychiatric conditions seen in AS patients. Our study suggests that young-middle age and being female may be risk factors for both admission and hospitalization in psychiatric emergencies.

In addition to the periodic stresses brought about by being a student, a housewife or unemployed is also seen among the risk factor groups. The fact that the patients in our study were generally at a high educational level can be explained by the easy accessibility of the young and student population because our hospital is located in a university campus. The fact that the patients had social security may be related to the fact that they felt more comfortable and secure about going to the ASs.

However, considering the intensity and workload of Emergency Departments, it should not be forgotten that they have critical importance in terms of assessing the mental health needs of patients as well as dealing with physical health problems.

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Conflict of Interest

The author declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Author Contributions

Plan, design: RK, ÖK; **Material, methods and data collection:** GT, RK; **Data analysis and comments:** RK, GT; **Writing and corrections:** RK, ÖK.

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Ethical Approval

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The Effect of Perceived Preoperative Nursing Care and Surgical Anxiety on Postoperative Recovery

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ABSTRACT

Objective: This study was conducted as a cross-sectional and correlational study to determine the effects of preoperative perceived nursing care and surgical anxiety on postoperative recovery. **Materials and Methods:** The population of the study consisted of 405 patients who were treated in the general surgery and urology clinics of two hospitals in Turkey between January and December 2023. Personal information form, Care Behavior Scale-24 (CBS-24), Surgical Anxiety Questionnaire (SAQ), and Postoperative Recovery Index (PoRI) were used to collect data. **Results:** The total mean score of the participants included in the study was 3.19±1.07 in the PoRI, 3.29±2.02 in the CBS-24, and 46.56±7.90 in the SAQ. According to the results of multiple linear regression analysis, the postoperative recovery status of patients undergoing surgical intervention is affected by care behaviors, income status and surgical anxiety levels. **Conclusion**: It was determined that the patients included in this study had great difficulty in recovery and experienced anxiety despite their perception of care being adequate. It was concluded that as the patients' perception of care increased, the difficulty in recovery decreased, and as their anxiety increased, the difficulty in recovery increased.

Keywords: Nursing Care, Surgical Anxiety, Postoperative Recovery.

Ameliyat Öncesi Algılanan Hemşirelik Bakımı ve Cerrahi Anksiyetenin Ameliyat Sonrası İyileşmeye Etkisi

ÖZ

Amaç: Bu çalışma ameliyat öncesi algılanan hemşirelik bakımı ve cerrahi anksiyetenin ameliyat sonrası iyileşmeye etkisini belirlemek amacıyla kesitsel ve ilişki arayıcı olarak yapılmıştır. **Gereç ve Yöntem:** Araştırmanın evrenini Ocak-Aralık 2023 tarihleri arasında Türkiye'de bulunan iki hastanenin genel cerrahi ve üroloji kliniklerinde tedavi gören 405 hasta oluşturmuştur. Verilerin toplanmasında kişisel bilgi formu, Bakım Davranışları Ölçeği-24 (BDÖ), Cerrahi Anksiyete Ölçeği (CAÖ) ve Ameliyat Sonrası İyileşme İndeksi (ASİİ) kullanılmıştır. **Bulgular:** Araştırma kapsamına alınan hastaların ASİİ toplam puan ortalaması 3.19±1.07, BDÖ toplam puan ortalaması 3.29±2.02 ve CAÖ toplam puanı 46.56±7.90 olarak bulundu. Çoklu lineer regresyon analizi sonuçlarına göre cerrahi girişim geçiren hastaların ameliyat sonrası iyileşme durumlarını; bakım davranışları, gelir durumu ve cerrahi anksiyete düzeyleri etkilemektedir. **Sonuç:** Bu araştırma kapsamına alınan hastaların iyileşmede çok güçlük yaşadığı, bakım algılarının yeterli olmasına rağmen anksiyete deneyimledikleri belirlendi. Hastaların bakım algıları arttıkça iyileşme güçlüğünün azaldığı, anksiyeteleri arttıkça iyileşme güçlüğünün arttığı sonucuna varıldı**.**

Anahtar Kelimeler: Hemşirelik Bakımı, Cerrahi Anksiyete, Ameliyat Sonrası İyileşme

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INTRODUCTION

The postoperative recovery process is intricate, involving physiological findings, changes in psychological status, social and habitual functions, and the incidence of side effects (Dığın & Kızılcık Özkan, 2021). The goal of this process is to achieve independence in daily life activities and attain biopsychosocial optimum. Effective postoperative recovery should be supported by a preoperative assessment of the patient and the development of a nursing care plan tailored to individual needs (Gustafsson et al., 2020). Caregiving, a fundamental role of nursing, is the essence of the profession and is central to critical thinking and nursing practices (Chen et al., 2018). The concepts of care and nursing are not separate but parts of a unified phenomenon (Gül & Arslan, 2021). The interaction between nurse and patient during care, including scientific and artistic aspects, supports the healing process and positively affects recovery (Arslan et al., 2014). Nursing care meets patients' expectations and needs, ensuring compliance with treatment, health improvement, and restoration. To enhance the quality of nursing care, it is essential to understand patients' perceptions of the care they receive and investigate factors influencing this perception (Aydın et al., 2019). Research by Kersu et al. indicates that patients perceive nursing care to be of high-quality indicators (Kersu et al., 2020). Another critical factor in providing quality healthcare is managing patients' anxiety levels. During the perioperative process, patients may experience anxiety about loss of control, pain, uncertainties, fear of death, inability to wake up, and disruption of body integrity (Çevik, 2018; Dayılar et al., 2017). Anxiety is known to cause dysfunction in the postoperative period, decrease quality of life, negatively impact disease recovery, prolong hospital stays, and increase healthcare costs (Çevik, 2018). Assessing patients' anxiety levels before surgery and providing psychosocial support can positively prevent the development of postoperative medical complications.

In line with this information, it is believed that determining patients' perceptions of nursing care quality and anxiety levels plays an important role in improving postoperative recovery and the quality of patient care in both the preoperative and postoperative periods. Therefore, this study was conducted to determine the effect of perceived preoperative nursing care and surgical anxiety on postoperative recovery in patients hospitalized in surgical clinics.

Research Questions

•What are the perceptions of nursing care quality, anxiety, and postoperative recovery levels of patients hospitalized in surgical clinics?

•Is there a relationship between nursing care quality perceptions, anxiety, and postoperative recovery levels of patients hospitalized in surgical clinics?

MATERIALS AND METHODS

Type of research

This study was conducted as a cross-sectional and correlational study to determine the effect of perceived preoperative nursing care and surgical anxiety on postoperative recovery. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist was used.

Research population and sample

The study population consisted of patients treated in the general surgery and urology clinics of two hospitals in Turkey between January and December 2023. Participants were included in the study using a simple random sampling method. The study was completed with 405 patients who voluntarily agreed to participate and met the inclusion criteria. The inclusion criteria were volunteering to participate in the study, being 18 years of age or older, having undergone surgical intervention, not having a diagnosis of psychiatric disease, not having a disorder of consciousness due to medication or existing diseases, being open to communication and cooperation, and answering the questions fully and completely.

Data collection and tools

Data were collected using a personal information form, the Caring Behaviors Scale-24, the Surgical Anxiety Questionnaire, and the Postoperative Recovery Index.

The Personal Information Form: This form includes nine questions in total covering sociodemographic information such as age, gender, marital status, educational status, employment status, and the presence of a chronic disease (Çevik, 2018; Çakır et al, 2024).

The Care Behaviors Scale-24 (CBS-24): The Care Behaviors Scale-24, created by Wu et al. (2006), is designed to assess the nursing care process. It is used in various hospital units to evaluate the quality of nursing care provided by both patients and nurses. The Turkish validity and reliability study of the scale was conducted by Kurşun and Kanan (2012). The scale consists of 24 items divided into 4 subgroups: assurance, knowledge-skill, respectfulness, and commitment. Responses are measured using a six-point Likert-type scale. The total scale score, ranging from 1 to 6, is obtained by summing the scores of all items and dividing by 24. Higher average scores indicate a higher perceived quality of care. For this study, the Cronbach Alpha value of the scale was 0.92, with subgroup values ranging between 0.81 and 0.94.

The Surgical Anxiety Questionnaire (SAQ): The SAQ, developed by Burton et al. (2018) and adapted into Turkish by Bölükbaş and Göl (2021), is a five-point Likert-type scale consisting of 17 items. Patients assess the preoperative period based on how much each item reflects their feelings. The scale has three sub-dimensions: health-related anxiety, recovery-related anxiety, and procedure-related

anxiety. The total score is obtained by summing the sub-dimension scores and the scores of three additional items not included in these sub-dimensions. The scale ranges from 0 to 68, with higher scores indicating higher levels of surgical anxiety. In this study, the total Cronbach's alpha value of the scale was 0.891, with subscale values of 0.81 for health-related anxiety, 0.76 for recovery-related anxiety, and 0.76 for procedure-related anxiety.

The Postoperative Recovery Index (PoRI): Developed by Butler et al. (2012) and validated in Turkish by Cengiz and Aygin (2019), the PoRI consists of 25 items. The PoRI has 5 sub-dimensions: psychological symptoms, physical activities, general symptoms, bowel symptoms, and appetite symptoms. Sub-dimension scores are determined by summing and averaging the items in each sub-dimension. The total score is the arithmetic mean of all 25 items. Higher scores reflect more difficulty in postoperative recovery, while lower scores indicate an easier recovery. For this study, the Cronbach's Alpha value of the scale was 0.94, with subgroup values ranging from 0.91 to 0.96.

Statistical analysis

The data obtained from the study were evaluated using the SPSS (Statistical Package for Social Sciences) 27.0 statistical package program. Descriptive statistical methods such as number, and percentage calculations and the arithmetic mean were used. The Skewness-Kurtosis distribution test was used to examine the normal distribution. Student's t-test, one-way ANOVA, Pearson correlation analysis, and linear regression analysis were used to compare variables with a normal distribution between groups. Statistical significance was accepted at the $p < 0.05$ level.

Ethical considerations

Written permission was obtained from the Gumushane University Health Sciences Institute Ethics Committee (Date: 27.12.2022, Approval no: E-95674917-108.99-149334,). Informed consent was obtained from the patients in accordance with the principle of voluntariness. The study was conducted in accordance with the Declaration of Helsinki.

RESULTS

The mean age of the patients included in the study was 48.25±3.16 years (range: 21-78), with 68.4% being male. Among the participants, 57.7% were single, 75.8% had an associate degree, 73.3% had an income equal to their expenses, 75.6% were employed, 77% had no chronic diseases, and 87.9% lived in the city center. The type of surgical intervention was abdominal surgery for 55.6% of the participants, and 66.7% experienced a surgical intervention for the first time. Single patients who underwent surgical intervention had higher PoRI scores than married patients (p=0.047). There was no significant difference in PoRI scores concerning participants' gender, educational status, employment status, place of residence, and surgical experience. Further analysis showed a significant difference between income status and PoRI scores, with participants whose income was higher than their expenses having significantly higher PoRI scores. Participants without chronic diseases had significantly higher PoRI scores than those with chronic diseases (p=0.048). Patients who underwent abdominal surgery had significantly higher PoRI scores than those who underwent orthopedic surgery (p<0.001). There was no significant difference between the sociodemographic characteristics of the participants and their CBI-24 scores (p>0.05).

Female participants had significantly higher SAQ scores than male participants (p=0.002). Participants whose income was lower than their expenditure had significantly higher SAQ scores than those whose income was equal to or higher than their expenditure (p<0.001). Participants with chronic diseases had significantly higher SAQ scores than those without chronic diseases (p<0.001). Participants living in villages had significantly higher SAQ scores than those living in city centers (p<0.001). Patients who underwent abdominal surgery had higher SAQ scores than those who underwent orthopedic surgery and other surgical interventions included in the study.

Participants with three or more surgical interventions had higher SAQ scores than those undergoing surgery for the second time (p<0.001). No significant difference was found between SAQ scores and marital status, educational status, employment status (Table 1).

Table 1. The PoRI, CBS-24, and SAQ scores according to some descriptive characteristics (n=405).

		PoRI	CBS-24	SAQ
Scales	**n (%)**	**Mean±SD**	**Mean±SD**	**Mean±SD**
Gender				
Female	128 (31.6)	3.23±1.09	3.31±1.98	47.39±8.01
Male	277 (68.4)	3.10±1.02	3.26±2.10	44.78±7.38
t; p		1.164; 0.245	0.227; 0.821	3.126; **0.002**
Marital status				
Married	172 (42.5)	3.07±1.14	3.34±2.06	46.41±7.71
Single	233 (57.5)	3.28±1.00	3.23±1.96	46.67±8.05
t; p		-1.991; **0.047**	-0.552; 0.581	-0.326; 0.744

t: student t-test.

Table 1 (Continue) The PoRI, CBS-24, and SAQ scores according to some descriptive characteristics (n=405).

		PoRI	CBS-24	SAQ
	n (%)	Mean±SD	Mean±SD	Mean±SD
Education level				
Primary school	41 (10.1)	3.39±0.80	3.32±1.91	49.04±5.63
High school	24 (5.9)	2.83±0.91	3.29±2.05	45.00±8.17
Associate degree	307 (75.8)	3.19±1.11	3.28±2.04	46.25±8.26
Bachelor's degree	33 (8.2)	3.21±1.02	3.33±1.97	47.57±6.04
F; p		1.374; 0.250	0.008; 0.999	2.020; 0.111
Income level				
Income less than expenses[1]	96 (23.7)	3.34±1.04	3.07±2.02	49.33±5.80
Income equal to expenses[2]	297 (73.3)	3.17±1.26	3.50±2.61	47.58±7.27
Income more than expenses[3]	12 (3)	2.75±1.00	3.35±1.99	43.05±8.96
F; p		11.464; **<0.001**	0.765; 0.466	13.273; **<0.001**
		1>3		3<2; 3<1
Employment status				
Yes	306 (75.6)	3.30±1.04	3.18±2.14	46.79±7.46
No	99 (24.4)	3.16±1.07	3.33±1.98	46.49±8.05
t; p		1.181; 0.238	-0.620; 0.536	0.333; 0.739
Chronic disease				
Yes	93 (23)	3.00±1.05	3.34±2.07	47.37±8.06
No	312 (77)	3.25±1.07	3.28±2.00	43.87±6.71
t; p		-1.984; **0.048**	0.286; 0.775	-3.812; **<0.001**
Place of residence				
City center[1]	356 (87.9)	3.17±1.09	3.28±2.04	46.00±7.94
District[2]	16 (4.0)	3.38±0.61	3.25±1.84	49.33±7.24
Village[3]	33 (8.1)	3.39±0.93	3.42±1.92	53.50±1.54
F; p		0.928; 0.396	0.079; 0.924	9.475; **<0.001**
				(3>1)
Type of surgical intervention	225 (55.6)	3.36±1.0	3.48±2.01	47.80±7.54
Abdominal surgery[1]	136 (33.6)	2.91±1.12	3.01±1.94	45.50±8.72
Orthopedic surgery[2]	44 (10.8)	3.20±1.09	3.23±2.21	43.54±5.51
Other[3]		7.679; **<0.001**	2.315; 1.00	7.443; **<0.001**
F; p		1>2		1>3; 1>2
Surgical experience				
First time[1]	270 (66.7)	3.12±1.09	3.18±2.03	50.30±3.90
Second time[2]	122 (30.1)	3.30±1.03	3.57±2.03	45.37±8.14
3 and above[3]	13 (3.2)	3.69±0.480	3.00±1.58	48.81±7.06
F; p		2.579; 0.077	1.760; 0.173	9.866**;<0.001**
				(3>2)

t: student t-test, F: One-way ANOVA

There was a weakly significant negative correlation between the participants' mean of the PoRI scores and their mean of the CBS-24 scores (p<0.001), and a weakly significant positive correlation between their mean of the SAQ scores (p=0.006) (Table 2).

Table 2. The relationship between the PoRI, CBS-24, and SAQ scores.

	(1)	(2)	(3)
(1) PoRI	1		
(2) CBS-24	r=-0.210 p<0.001	1	
(3) SAQ	r=0.136 p=0.006	r=0.020 p=0.686	1

r: pearson correlation analysis

The mean of the PoRI total score of the patients included in the study was 3.19±1.07, the mean of the CBS-24 total score was 3.29±2.02, and the total SAQ score was 46.56±7.90 (Table 3).

The results of the multiple linear regression analysis indicated that care behaviors, income status, and surgical anxiety levels statistically significantly affect the postoperative recovery status of patients undergoing surgical intervention. These variables account for 11% of the total variance (Table 4).

Table 3. The PoRI, CBS-24, and SAQ scores.

Scales	Mean±SD
The PoRI total score	3.19±1.07
Psychological symptoms	3.61±1.57
Physical activities	3.20±1.22
General symptoms	2.79±1.57
Bowel symptoms	3.19±1.72
The CBS-24 total score	3.29±2.02
Assurance	3.41±1.57
Knowledge-skill	3.57±1.74
Respectfulness	3.07±1.58
Commitment	3.80±1.93
The SAQ total score	46.56±7.90
Health-related anxiety	11.95±4.60
Recovery-related anxiety	10.40±2.88
Procedure-related anxiety	12.73±2.59

Table 4. Multiple regression analysis between the postoperative recovery status of patients and independent variables.

Model	B	SE	β	t	p	VIF
Fixed	2.196	0.371		5.928		
CBS-24	-0.102	0.025	-0.192	4.063	<0.001	1.009
SAQ	0.013	0.007	0.093	1.912	0.052	1.062
Income level	-0.203	0.081	-0.119	-2.525	0.012	1.007
	0.162	0.041	0.193	3.973	<0.001	1.067

Model R=0.339; R^2 =0.115; Adjusted R^2=0.106; F=12.955; p< 0.001; Durbin Watson=0.722. Dependent variable: PoRI

DISCUSSION

Anxiety is one of the most common psychological reactions in patients (80%) scheduled for various surgeries. Increased preoperative anxiety levels are associated with both psychological and somatic negative outcomes and adversely impact the perception of care and postoperative recovery (Zemla et al., 2019).

In this study, the mean of the total score of the PoRI was 3.19±1.07, indicating significant difficulty in recovery. According to the literature, postoperative challenges vary based on the type of surgery, anesthesia, and incision site (Yolcu and Akın, 2015). A study on coronary artery bypass graft surgery patients reported that those with high self-efficacy experienced fewer postoperative recovery difficulties (Çakır et al., 2024). Another study on urological interventions emphasized that patients faced recovery difficulties, with nutrition being a significant factor (Demirdağ et al., 2024). A systematic review highlighted that early mobilization significantly positively impacted recovery difficulties (Uğurlu et al., 2017). Recovery difficulties appear to be common regardless of surgical intervention, influenced by various factors.

The mean of the total score of the patients in this study regarding their perception of care was 3.29±2.02, indicating a slightly high level. Studies on the perception of care in surgical patients found it to be high by Özsoy et al., 2023. Thus, the perception of care among surgical patients can be considered adequate.

The total SAQ score of the patients was found to be 46.56±7.90, indicating that they experienced anxiety. Anxiety develops in every individual hospitalized for medical or surgical reasons due to the unfamiliar environment and disease process (Zemla et al., 2019). A meta-analysis study emphasizes that patients experience preoperative anxiety, which negatively affects the healing process and patient satisfaction, and that social support is crucial in reducing anxiety (Kok et al., 2023). Evaluating anxiety is essential for patients undergoing surgical intervention, and early identification can positively influence the treatment course.

The study found that as patients' perception of care increased, their difficulty in recovery decreased, whereas increased anxiety was associated with greater recovery difficulty. Another study reported that patients with an adequate perception of nursing care had lower levels of anxiety and depression (Buldan & Kurban, 2018). Similarly, a study on the perception of care in patients hospitalized in internal and surgical clinics stated that the perception of care affects patient satisfaction and is an important factor in the healing process (Akışık & Atay, 2022). In a study on patients with gallbladder cancer, it was found that while the perception of nursing care did not significantly affect the quality of life, it had a significant effect on anxiety and depression (Liu et al., 2022), suggesting that the perception of care, anxiety, and the recovery process are interrelated and important factors.

The study showed that single patients, those with higher incomes, and those without chronic diseases had more recovery difficulties than married patients, those with lower incomes, and those with chronic diseases, respectively. Social support improves patients' psychological status and increases their resilience (Kapıkıran & Bulbuloglu, 2024). Similarly, married patients have lower anxiety levels than single patients, positively impacting the recovery process (Karabulut et al., 2023). This finding highlights the positive effect of social support on patient recovery.

Contrary to our study, some other literature indicates that surgical patients with low incomes and chronic diseases experience more recovery difficulties because they cannot meet their care expenses (Burgoon et al., 2021; Karabulut et al., 2023). Factors such as the type and duration of the surgical intervention are thought to influence these results.

The study also revealed that patients who underwent abdominal surgical interventions experienced more recovery difficulties than those who underwent orthopedic surgery. Various factors, such as surgical technique, duration, and type of intervention, affect recovery (Zhang et al., 2022). Collecting data in the early postoperative period may account for the greater recovery difficulties observed in abdominal surgical interventions.

The study revealed that female patients, those whose income was lower than their expenses, those with chronic diseases, those living in villages, and those undergoing abdominal surgical interventions had higher levels of anxiety compared to patients undergoing other surgical interventions. Another study investigating the effect of sociodemographic factors on anxiety, depression, and perceived social support in patients with internal medicine and surgical problems found that more than half of the patients experienced anxiety, with higher levels in women, those with children, those who were divorced, those living in villages, those who were illiterate, had low income, and had chronic diseases (Yüksel & Bahadır Yılmaz, 2020). Additionally, it was emphasized that anxiety and depression are integral to surgical procedures, especially among patients with chronic diseases, suggesting that anxiety is influenced by sociodemographic factors.

Among the patients in the study, those who had undergone three or more surgical interventions had higher anxiety levels than those experiencing a surgical intervention for the second time. In the study by Yüksel & Bahadır Yılmaz (2020), it was found that patients undergoing surgical procedures experience anxiety, with no significant difference in anxiety levels based on the number of surgical interventions. However, anxiety was significantly higher in patients with early hospitalization and early surgical intervention.

In a study evaluating anxiety and depression levels in patients undergoing mastectomy surgery, the number of surgical interventions did not significantly affect anxiety levels, with young age being the most important factor (Stergiannis et al., 2021). Another study on preoperative anxiety and related factors found that patients with more surgical interventions had higher anxiety levels (Mulugeta et al., 2018). Differences in surgical interventions and sampling variations may explain these results.

The multiple linear regression analysis of the study revealed that care behaviors, income status, and surgical anxiety levels have a statistically significant impact on the postoperative recovery status of patients undergoing surgical interventions. These variables account for 11% of the total variance. Regression analysis of a study conducted about the anxiety of surgical patients showed that female gender, provision of preoperative information, and prior surgical experience were related to patient anxiety (Mulugeta et al., 2018). Wang et al. (2021) also concluded that preoperative anxiety decreases physical capacity and increases pain, particularly in elderly patients (Wang et al., 2021). These findings suggest that the type and duration of surgical intervention, along with the sociodemographic characteristics of the patients, significantly influence recovery outcomes.

Limitations and Strengths

The study had some limitations, including focusing only on general surgery and urology patients.

CONCLUSION

It was found that the patients in this study had significant difficulty in recovery and experienced anxiety, despite an adequate perception of care. The study concluded that as patients' perceptions of care improved, their recovery difficulties decreased, and increased anxiety led to greater recovery difficulties. Additionally, single patients, those with higher incomes, and those without chronic diseases who underwent surgical intervention faced more recovery challenges than married patients, those with lower incomes, and those with chronic diseases, respectively. Analyzing the surgical anxiety levels, it was observed that female patients, those with incomes lower than their expenses, patients with chronic diseases, those living in villages, and those who underwent abdominal surgical interventions had higher anxiety levels than those who underwent other types of surgical interventions.

Patients who had undergone three or more surgical interventions had higher anxiety levels than those undergoing their second surgical intervention. Multiple linear regression analyses revealed that care behaviors, income status, and surgical anxiety levels significantly affected the postoperative recovery status of patients who underwent surgical interventions.

It is crucial for nurses to assess anxiety levels in all patients scheduled for surgical interventions and to plan and implement strategies to prevent or reduce anxiety. These measures have a direct impact on patient care perceptions and recovery.

Future studies should focus on identifying factors that can reduce preoperative anxiety and evaluating their effects on a larger sample.

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Conflict of Interest

The author declares no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Author Contributions

Plan, design: NK; **Material, methods and data collection:** NK, AAS; **Data analysis and comments:** NK, AAS; **Writing and corrections:** NK, AAS.

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Relationship Between Adults' Disordered Eating Behaviors, Insomnia Complaints and Cognitive Failures

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ABSTRACT

Objective: The aim of this study is to assess the correlation between adults' disordered eating behaviors, insomnia complaints, and cognitive failures. In addition, a comparison was made regarding cognitive failures, disordered food, and insomnia based on gender and body mass index. **Materials and Methods:** We conducted this cross-sectional study with 364 adults aged 18 to 65 years. Participants completed an online questionnaire including general information, dietary habits, cognitive failures scale (CFQ), insomnia complaints and sleep quality basic scale (BaSIQS) and eating disorder assessment scale (EDE-Q-13). IBM SPSS (Statistical Package for Social Sciences) 25.0 package program was used to evaluate the data. **Results:** EDE-Q-13 total score was significantly positively correlated with BaSIQS and CFQ total score and its sub-dimensions ($p<0.05$). BaSIQS total score is significantly positively correlated with CFQ total score and its sub-dimensions ($p<0.05$). Men achieved a higher mean score on the EDE-Q-13 in comparison to women ($p<0.05$). General cognitive failures and concentration sub-dimension scores were higher in women ($p<0.05$) The general cognitive failure sub-dimension scores of underweight women were higher than those of normal body weight and slightly overweight-fat women ($p<0.05$). **Conclusion:** Disordered eating behavior has been associated with complaints of insomnia and cognitive failures in adults in the community. This study indicates the importance of targeting regular sleep patterns and preserving cognitive function in the avoidance of eating disorders. Regular sleep and participation in activities to improve cognitive function should be considered a healthy lifestyle approach alongside diet and physical activity for public health

Keywords: Eating Disorders, Cognitive Failures, Cognition, Insomnia, Sleep Quality.

Yetişkinlerin Bozulmuş Yeme Davranışları, Uykusuzluk Şikayetleri ve Bilişsel Başarısızlıkları Arasındaki İlişki

ÖZ

Amaç: Çalışma yetişkin bireylerin bozulmuş yeme davranışları ile günlük aktivitelerindeki bilişsel başarısızlıkları ve uykusuzluk şikayetleri arasındaki ilişkiyi değerlendirmek amacıyla yürütülmüştür. Ayrıca yeme, uyku ve bilişteki bozulmalar cinsiyet ve beden kütle indeksi sınıflamasına göre kıyaslanmıştır. **Gereç ve Yöntem:** Çalışma kesitsel tipte olup 18-65 yaş arası 364 yetişkin birey ile yürütülmüştür. Katılımcılar genel bilgiler, beslenme alışkanlıkları, bilişsel başarısızlıklar ölçeği (CFQ), uykusuzluk şikayetleri ve uyku kalitesi temel ölçeği (BaSIQS) ve yeme bozukluğu değerlendirme ölçeğini (EDE-Q-13) içeren online anket formunu doldurmuşlardır. Verilerin değerlendirilmesinde IBM SPSS (Statistical Package for Social Sciences) 25.0 paket programı kullanılmıştır. **Bulgular:** EDE-Q-13 toplam puanı, BaSIQS ve CFQ toplam puanı ve alt boyutları ile pozitif yönde anlamlı olarak ilişkilidir ($p<0.05$). BaSIQS toplam puanı, CFQ toplam puanı ve alt boyutları ile pozitif yönde anlamlı olarak ilişkilidir ($p<0.05$). EDE-Q-13 toplam puanı erkeklerde kadınlara kıyasla daha yüksektir ($p<0.05$). Genel bilişsel başarısızlıklar ve konsantrasyon alt boyut puanları kadınlarda daha yüksektir ($p<0.05$). Kadınlar arasında zayıf olanların genel bilişsel başarısızlıklar alt boyut puanları normal vücut ağırlığında olanlara ve hafif kilolu-şişman olanlara kıyasla daha yüksektir ($p<0.05$). **Sonuç:** Toplumdaki yetişkinlerde bozulmuş yeme davranışı uykusuzluk şikayetleri ve bilişsel başarısızlıklar ile ilişkili bulunmuştur. Bu çalışma yeme bozukluklarının önlenmesinde düzenli uyku düzenini ve bilişsel işlevi korumanın hedeflenmesinin önemine işaret etmektedir. Düzenli uyku ve bilişsel işlevi geliştirme faaliyetlerine katılım halk sağlığı açısından diyet ve fiziksel aktivitenin yanı sıra sağlıklı yaşam tarzı yaklaşımı olarak ele alınmalıdır.

Anahtar Kelimeler: Yeme Bozukluğu, Bilişsel Başarısızlıklar, Biliş, Uykusuzluk, Uyku Kalitesi.

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INTRODUCTION

Eating disorders include a set of persistent psychiatric conditions distinguished by the emergence of atypical eating patterns, distress over physical attributes, excessive preoccupation with body image, and an unhealthy preoccupation with weight regulation (Wu et al., 2020; Neumark-Sztainer et al., 2011). The incidence of eating disorders has escalated in developed and developing nations due to the processes of industrialization, urbanization, and globalization, although they are more prevalent in Western societies. (Makino et al., 2004; Pike et al., 2014). Due to the elevated risk of mortality, propensity for chronicity, and increased prevalence of eating disorders, a comprehensive evaluation of these conditions is necessary. (Smink et al., 2012). Most types of eating disorders impair sleep quality. It has been reported that plasma orexin concentrations may contribute to decreased sleep quality in restrictive and malnourished individuals (individuals with anorexia nervosa). (Sauchelli et al., 2016). A decrease in sleep quality due to high body mass index and sleep apnea has been reported in people with binge eating syndrome and night eating syndrome (Cho et al., 2020; Yeh and Brown, 2014). An increased likelihood of eating disorders has been linked to insomnia. Moreover, the treatment of eating disorders is adversely affected by insomnia (Allison et al., 2016). Sleep is considered an important regulator of neurobiological processes and memory (Feld and Born, 2020). People with insomnia often complain about problems with daytime functioning involving cognitive effort, including attention, memory, and focus (Wilkerson et al., 2012). These problems are related to the inability to successfully carry out routine responsibilities and are referred to as 'cognitive failures'. While cognitive failures are a common occurrence, certain individuals are more prone to committing these minor errors. The cognitive changes are often triggered by insomnia, stress, and anxiety, but can sometimes be diet-related (Barkus, 2015; Tuck et al., 2023). Nutrition may induce cognitive impairment through oxidative and inflammatory pathways (Baierle et al., 2015; Muñoz and Costa, 2013). It is worthwhile to conduct research to determine the risk of eating disorders in individuals living in the community. Eating disorders may be influenced by personality traits, emotional state and environmental factors (Bakalar et al., 2015). Additionally, there have been prior reports suggesting that eating disorders may originate from neurobiological mechanisms (Kaye et al., 2009). Increasing research to identify risk factors and associated conditions that contribute to eating disorder pathology helps efforts to prevent this disorder (Ciao et al., 2014). The relationships between sleep, cognition, and eating have been treated as binary in most studies. The principal objective of this investigation was to compile the relationships among these three conditions in a single study. Another aim was to compare the disorders in sleep, cognition, and eating according to gender and body mass index classification.

MATERIALS AND METHODS

Study type and sample

This was a cross-sectional study evaluating relationships among sleep, cognition, and eating behaviors of adults. Power analysis was conducted to determine the number of adults needed to be included in this study.Error margin, power, and effect size were set at 0.05, 0.95, and 0.5, respectively. It was found that at least 176 adults would be needed to participate in this study. However, in order to obtain more accurate results, a higher number of participants was reached and the study was completed with a survey of 364 adults.Volunteers aged 18 to 65 were eligible to participate in the research, while those who were pregnant or breastfeeding were excluded.

Data collection

The data for the study were gathered electronically via a hyperlinked survey that was distributed to the participants. The participants were administered the questionnaires via social media groups facilitated by renowned individuals. The participants who consented to take part in the research filled out the questionnaire. It comprised the following sections: general information, eating habits, the cognitive failure scale, complaints of insomnia, the sleep quality fundamental scale, and the eating disorder assessment scale. The initial page of the digital survey contained details pertaining to the research, accompanied by an area designated for the completion of the consent form. After reading this explanation and providing their consent via the consent form, the participants moved on to the section addressing the research questions and responded within a time frame of approximately 10 to 15 minutes.

Cognitive Failures Questionnaire (CFQ): Broadbent et al. (1982) devised this scale for the purpose of evaluating cognitive function. Eser et al. examined the validity and dependability of the scale in Turkey. The cumulative score derived from the 25 queries comprising the Likert-type scale with four points (0 = never, 1 = rarely, 2 = occasionally, 3 = often) is 75. General cognitive failures, inattention, concentration, names (memory), and social failings are its five sub-dimensions. An upward trend in scale score is indicative of cognitive functioning that is disordered. The Turkish version was documented to have a Cronbach's alpha coefficient of 0.91 (Eser et al., 2020).

The BaSIQS is the Basic Scale of Insomnia Complaints and Sleep Quality: The seven-item scale was created in 2015 by Allen Gomes et al. The Turkish investigation on the scale's validity and reliability was carried out by Mıhçıoğlu et al. (2021). The scale inquires of participants the following: the duration of time required to fall asleep, the frequency

of difficulties in initiating sleep, the frequency of nighttime awakenings, the predicament of waking up early in the morning or late at night, the subjective definition of sleep irrespective of its duration, and the quality of sleep experienced. It consists of two sub-dimensions: difficulty falling unconscious and difficulty waking up. The total score and sub-dimension scores are calculated by adding the scores of each item on a scale from zero to four. The range of possible total scores on the scale is from 0 to 28. The Cronbach's alpha coefficient of the scale was reported as 0.752 (Mıhçıoğlu et al., 2021).

Eating Disorder Evaluation Scale (EDE-Q-13): The instrument was designed for the evaluation of food disorders by Fairburn and Beglin in 1994. A study on the validity and reliability of Turkish data was undertaken by Esin and Ayyıldız in 2022. The scale exhibited a Cronbach's alpha value of 0.89, while the Cronbach's alpha values for the five sub-dimensions were computed in the range of 0,75-0,94. It consists of five sub-dimensions: restricted eating, concern about body shape and body weight, body dissatisfaction, binge eating, and purging. The scoring process is conducted using a seven-point Likert scale. A greater degree of eating-related psychopathology is indicated by a higher score (Esin & Ayyıldız, 2022).

Anthropometric Measurements: Participants' height and body weight were collected based on self-reports in an online questionnaire. Body mass index (BMI) values of individuals were calculated by dividing body weight in kilograms (kg) by the square of height in meters (m) (kg/m^2) according to the World Health Organization (WHO) assessment. BMI results were evaluated according to the WHO classification. According to this classification, BMI<18.5 is underweight, 18.5-24.9 is normal, 25-29.9 is overweight, and ≥30 kg/m^2 is obese (Zierle-Ghosh and Jan, 2018).

Statistical analysis

The program IBM SPSS 25.0 (Statistical Package for the Social Sciences) was utilized to analyze the data. For descriptive statistics, mean, standard deviation, number, and percentage values were utilized. In lieu of parametric approaches, table construction was undertaken due to the absence of a normal distribution in the data. The significance of the difference between the means of three or more groups was assessed using the Kruskal-Wallis test, while the difference between the means of two groups was evaluated using the Mann-Whitney U test. Using Spearman correlation analysis, the associations among the scale scores were ascertained. The level of significance was assessed at $p<0.05$.

Ethical considerations

Approval was obtained from the Health Sciences Ethics Committee of Çankırı Karatekin University (Date:19.03.2024, Approval no No:12). The research was performed in accordance with the principles of the Declaration of Helsinki.

RESULTS

Table 1 provides an overview of the participants' general characteristics. 29.40% of the individuals were men, and 70.60% were women. The rates of smoking and alcohol use among the participants were 24.18% and 20.88%, respectively. The rate of those who exercised regularly was 31.87%. The mean age of the individuals was 24.51±8.1 years, and the mean BMI was 23.1±3.7 kg/m^2. The eating habits of the participants are given in Table 2. 3.57% of individuals had one meal, 54.40% had two meals and 42.03% had three meals. The majority of participants (59.89%) skip their main meals. They frequently reported skipping breakfast (46.98%) and lunch (46.98%). 18.41% of the individuals had slow eating habits, 57.69% had moderate eating habits and 23.90% had fast eating habits.

Table 1. General characteristics of the participants (n=364).

	n	%*
Gender		
Male	107	29.40
Female	257	70.60
Smoking habit		
Yes	88	24.18
No	276	75.82
Alcohol Use		
Yes	76	20.88
No	288	79.12
Exercise regularly		
Yes	116	31.87
No	248	68.13
Total	**364**	**100.0**
Age (years)(mean±standard deviation)		24.51±8.1
BMI (mean± standard deviation)		23.1±3.7

*Column percentage.

Table 3 presents a comparison of the scale ratings of the participants according to their body mass index classification and gender. EDE-Q-13 total score and sub-dimension scores (restricted eating, concern about body shape and body weight, body dissatisfaction, binge eating) significantly differed according to women's BMI classification (p<0.001). Overweight and obese women had higher mean values for these scores. In the overweight and obese group, both the total score and the restricted eating sub-dimension score for men were substantially higher (p0.05). For both genders, complaints of insomnia and the total score and sub-dimension scores (problems falling asleep, problems waking up) of the sleep quality baseline scale did not differ according to BMI classification (p>0.05). There was no significant difference in the total score of the cognitive failure scale based on BMI classification in both genders (p>0.05). The general cognitive failure sub-dimension score was significantly higher among underweight women (p=0.011). The social failure sub-dimension score was significantly higher among men who exhibited a healthy body weight (p=0.027). When examining restricted eating and body dissatisfaction scores across genders, it was found that women had substantially higher scores (p<0.05). EDE-Q-13 total score and other sub-dimensions (concerns about body shape and body weight, binge eating, purging) were higher in men (p<0.05). Women had higher sub-dimension scores on general cognitive failures and concentration than males (p<0.05).

Table 4 presents the correlations that exist between the total scores and sub-dimension scores of the instruments. The EDE-Q-13 total score was significantly positively correlated with the insomnia complaints and the sleep quality core scale (BaSIQS) and the cognitive failures scale (CFQ) total score and its sub-dimensions (p<0.05). Significant positive correlations exist between insomnia complaints and the sleep quality core scale (BaSIQS) and the total score and sub-dimensions of the cognitive failure scale (CFQ) (p<0.05).

Table 2. Participants' Eating Habits (n=364).

	Mean ± standard deviation	
Number of main meals	2.38±0.5	
Number of snacks	1.76±0.9	
	n	**%***
Number of main meals		
1	13	3.57
2	198	54.40
3	153	42.03
Skipping main meals		
Yes	218	59.89
No	146	40.11
The main meal that is skipped most often (n=218)		
Morning	116	53.21
Afternoon	95	43.58
Evening	7	3.21
The speed of eating		
Slow	67	18.41
Middle	210	57.69
Fast	87	23.90
Total	**364**	**100.0**

*Column percentage.

Table 3. Comparison of scale scores for individuals according to gender and body mass index classification (n=364).

	Female				Male				p^1	p^2	p^3
	Underweight n=25	**Normal n=172**	**Overweight and fat n=60**	**Total n=257**	**Underweight n=4**	**Normal n=52**	**Overweight and fat n=51**	**Total n=107**			
EDE-Q-13 total	0.94±1.1	1.19±1.1	2.05±1.0	1.37±1.1	0.59±0.4	1.27±1.2	1.58±1.0	1.39±1.1	**p<0.001**	**0.038**	**p<0.001**
Sub-dimensions of EDE-Q-13											
Restricted eating	0.70±1.2	1.39±1.5	2.16±1.8	1.50±1.6	0.0±0.0	1.46±1.6	1.64±1.3	1.49±1.5	**p<0.001**	**0.026**	**p<0.001**
Concern about body image and body weight	1.58±2.0	1.48±1.6	2.62±2.0	1.76±1.8	1.50±1.2	1.57±1.6	1.99±1.6	1.77±1.6	**p<0.001**	0.397	**p<0.001**
Body dissatisfaction	1.52±1.9	1.95±2.0	3.59±2.0	2.29±2.1	1.37±1.2	1.71±1.7	2.45±1.9	2.05±1.8	**p<0.001**	0.086	**p<0.001**
Binge eating	0.96±1.38	0.99±1.2	1.73±1.4	1.16±1.3	0.58±0.5	1.09±1.4	1.41±1.2	1.22±1.3	**P<0.001**	0.228	**p<0.001**
Detox	0.34±0.6	0.49±1.0	0.88±1.4	0.57±1.1	0.08±0.1	0.78±1.3	0.84±1.2	0.78±1.2	0.057	0.457	**0.017**
BaSIQS total score	12.76±5.0	11.93±3.5	11.65±3.8	11.94±3.7	13.75±0.5	11.86±4.0	11.96±4.5	11.98±4.2	0.528	0.376	0.288
BaSIQS sub-dimensions											
Difficulties falling asleep	8.04±3.8	7.20±2.9	6.51±2.5	7.12±2.9	9.75±2.0	7.19±3.0	7.0±3.3	7.19±3.2	0.141	0.202	0.056
Waking up problems	4.72±2.0	4.72±2.1	5.13±2.1	4.81±2.1	4.0±2.4	4.67±2.0	4.96±1.9	4.78±2.0	0.329	0.495	0.186
CFQ total score	36.24±13.3	29.29±10.8	30.95±10.6	30.35±11.2	24.75±8.0	27.67±13.1	27.31±8.9	27.39±11.0	0.059	0.874	0.078
Scores of CFQ sub-dimensions											
General cognitive failure	15.76±5.3	12.40±4.5	12.60±5.0	12.77±4.8	11.25±2.8	11.32±5.4	11.25±4.1	11.28±4.7	**0.011**	0.852	**0.011**
Carelessness	5.40±3.6	4.50±2.7	4.88±2.2	4.68±2.7	3.50±1.2	4.05±2.9	3.64±2.6	3.84±2.7	0.375	0.783	0.733
Concentration	10.32±3.4	8.49±3.1	9.03±2.9	8.79±3.1	8.50±5.0	8.19±3.7	8.07±2.7	8.14±3.3	0.059	0.749	**0.046**
Names	3.0±1.6	2.52±1.6	2.90±1.76	2.66±1.6	1.50±0.5	2.44±1.5	2.84±1.7	2.59±1.6	0.204	0.176	0.172
Social failure	1.76±1.6	1.36±1.3	1.53±1.5	1.43±1.4	0.0±0.0	1.65±1.5	1.49±1.3	1.51±1.4	0.577	**0.027**	0.908

p^1Analysis of the difference between scale scores according to the BMI classification of women, **p^2**Analysis of the difference between scale scores according to the BMI classification of men, **p^3**Analysis of the difference between scale scores according to gender BaSIQS: Insomnia Complaints and Sleep Quality Basic Scale, CFQ: Cognitive Failures Scale, EDE-Q-13: Eating Disorder Rating Scale, were analyzed with the Kruskal Wallis Test (p^1 and p^2) and Mann Whitney U Test (p^3).

Table 4. Correlations between the total scores and sub-dimension scores of the scales (n=364).

Variables	2. BaSIQS total score	2a. Difficulties falling asleep	2b. Waking up problems	**3. CFQ total score**	3a. General cognitive failure	3b. Carelessness	3c. Concentration	3d. Names	3e. Social failure
1. **EDE-Q-13 total score**	0.189**	0.155**	0.126*	0.307**	0.215**	0.340**	0.230**	0.190**	0.317**
1a. Restricted eating	0.088	0.065	0.074	0.168**	0.083	0.211**	0.110*	0.138**	0.235**
1b. Concern about body image and body weight	0.155**	0.155**	0.072	0.250**	0.189**	0.262**	0.215**	0.140**	0.197**
1c. Body dissatisfaction	0.178**	0.187**	0.051	0.326**	0.237**	0.315**	0.293**	0.213**	0.200**
1d. Binge eating	0.199**	0.142**	0.157**	0.287**	0.218**	0.332**	0.161**	0.185**	0.374**
1e. Detox	0.144**	0.056	0.185**	0.144**	0.086	0.241**	0.017	0.057	0.367**
2. BaSIQS total score				0.305**	0.302**	0.215**	0.199**	0.128**	0.239**
2a. Difficulties falling asleep				0.348**	0.342**	0.252**	0.262**	0.118**	0.213**
2b. Waking up problems				0.075	0.081	0.022	0.026	0.069	0.132*

*p<0.05, **p<0.01, BaSIQS: Insomnia Complaints and Sleep Quality Core Scale, CFQ: Cognitive Failures Scale, EDE-Q-13: Eating Disorder Rating Scale, Spearman correlation analysis was used.

DISCUSSION

Studies on eating disorders are generally conducted in high-risk groups (women, young people). In our study, eating disorders of adults in the community were evaluated through EDE-Q-13 (score; women: 1.37±1.1; men: 1.39±1.1) and higher scores were reported in previous studies conducted in adults (Zohar et al., 2023; Kübra and Ayyıldız, 2022). The differences may be explained by socio-cultural factors and social media exposures that emphasize body image more (Hoek, 2016; Holland & Tiggemann, 2016). In our study, men had higher eating disorder assessment scale scores. The existing body of literature suggests that there is a biological underpinning to the higher incidence of eating disorders among women. It has been reported that the testosterone hormone has protective effects that reduce eating pathology in men, and estrodiol increases eating pathology in women by mediating neural responses to tasteless foods (Culbert et al., 2021). A number of studies have reported in recent years that the prevalence of eating disorders is comparable to that of women and that muscle-focused eating disorder has increased significantly among males. (Murray et al., 2017; Sahlan et al., 2020). In our study, women had higher scores for body dissatisfaction and restricted eating. Increasing sociocultural pressures on women may be making them more inclined to restrictive eating to achieve the slim profile idealized by the media (Hesse-Biber et al., 2006). Examining socio-cultural and media influences is beyond the scope of this study, but is recommended for consideration in future research.

Cognitive failures are minor errors in thinking related to perception, memory, and concentration that are reported throughout daily life. They are more common in clinical cases (dementia and psychological disorders) but can also occur in healthy individuals (Carrigan & Barkus, 2016). In our study, we found that adults' cognitive failures differed between genders. Concentration deficits and general cognitive failures were more prevalent among women than males. Gender differences in cognitive impairments were consistent with the literature and may be due to hormones, genetics, and lifestyle factors (Au et al., 2017; Levine et al., 2021). In our study, cognitive failures were associated with complaints of insomnia. Insomnia is an important public health problem affecting large segments of society, and experimental studies have shown that a variety of cognitive functions can be impaired in healthy individuals by insomnia (Lim and Dinges, 2010; Reynolds and Banks, 2010). Cognitive failures are also associated with disordered eating behaviors. Cognition involves a variety of mental processes (e.g., perception, memory, learning, attention, decision-making, and language abilities), and executive functions, particularly those involving the control of behavior, have previously been reported to be implicated in the emergence of eating disorders by modulating hedonic processes in food intake (Miranda-Olivos et al., 2021; Ziauddeen et al., 2015).

We identified a correlation between complaints of insomnia and compromised dietary behavior in our research. Insomnia affects various hormone levels (leptin, ghrelin, cortisol, insulin, and melatonin) that regulate appetite. Changes in the levels of these hormones may also affect mood (depression, stress, and anxiety) and contribute to nutritional imbalances (Bernardi et al., 2009). Those with insomnia are more inclined to have disordered eating behaviors such as skipping breakfast, snacking late at night, replacing meals with snacks, irregular meal times, and consuming a calorie-rich diet (Kandeğer et al., 2021). A number of studies, consistent with our findings, have found a correlation between inadequate sleep and an increased risk of eating disorders (Allison et al., 2016; Christensen and Short, 2021).

Body mass index is a useful guide in the assessment of obesity, metabolic abnormalities, and complex diseases (Bray, 2023). Women who were underweight according to body mass index had higher overall cognitive failure scores. In previous studies, changes in body weight, especially obesity, have been reported to negatively affect brain structure and cognitive function (Prickett et al., 2015; Bashir et al., 2022). Underweight is a consequence of malnutrition, and normal cognitive functions require access to good and safe nutrition (Pizzol et al., 2021). Adequate intake of energy, macronutrients, and micronutrients and maintaining a healthy lifestyle are important for cognitive functions (Puri et al., 2023). In our study, body mass index was not found to be associated with insomnia complaints in both genders. Previous studies have reported that sleep quality decreased in those with a high body mass index (Gupta et al., 2022; Wang et al., 2019). In this study, overweight and obese individuals had higher eating disorder scores. Obese individuals experience body dissatisfaction and may resort to risky dieting practices to manage their body weight. They are therefore more likely to havee eating disorders (Jebeile et al., 2021).

Limitations and Strentghs

One of this study's advantages is that it was carried out using a sizable sample of adult healthy individuals; nonetheless, there are several restrictions. Cognitive performance, eating, and sleep disorders were assessed using easy-to-use and time-efficient scales. However, the use of self-reported measurement methods may have biased the results. The use of objective methods will provide more valid results. Young adults and women comprised the majority of participants, limiting the generalization of the findings. Another limitation of the study is that mediating factors such as mood were not investigated in the relationships between eating, sleep, and cognition. Future studies should test these relationships with different and more representative groups of participants, taking into account mediating factors.

CONCLUSION

As a result, it was determined that disordered eating behavior was correlated with insomnia complaints and cognitive failures in adults in the community. Efficient policies must be established to identify individuals with eating disorders in workplaces and schools and to guarantee timely access to treatment, in light of the rise in disordered eating behaviors, particularly in Western societies. This study emphasizes the importance of targeting insomnia and preserving cognitive function as preventative measures against eating disorders. Regular sleep and participation in activities to improve cognitive function should be considered a healthy lifestyle approach alongside diet and physical activity for public health.

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Conflict of Interest

The author declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Author Contributions

Plan, design: GH, FT; **Material, methods and data collection:** GH, FT; **Data analysis and comments:** GH, FT; **Writing and corrections:** GH, FT.

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Ethical Approval

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Smartphone Addiction, Sleep Quality and Musculoskeletal Disorders in University Students

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ABSTRACT

Objective: Smartphone addiction may lead to many health issues. Excessive smartphone usage has been linked to musculoskeletal disorders and sleep problems. We aimed to examine the correlation between smartphone addiction, sleep quality and musculoskeletal disorders. **Materials and Methods:** 60 university students were included in the study. Individuals' smartphone addiction, sleep quality and musculoskeletal disorders were evaluated with the Smartphone Addiction Scale (SAS), Pittsburgh Sleep Quality Index (PSQI) and Cornell Musculoskeletal Discomfort Questionnaire (CMDQ), respectively. **Results:** There was a weak correlation between SAS and PSQI's sleep efficiency, sleep disturbance, daytime dysfunction subscales, PSQI total score, and CMDQ's lower extremity and spine subscales (p=0.021, r=0.30; p=0.020, r=0.30; p=0.008, r=0.34; p=0.008, r=0.34; p=0.029, r=0.28; p=0.019, r=0.30). There was a well correlation between SAS and CMDQ's upper extremity subscale and CMDQ total score (p=0.001, r=0.43; p=0.001, r=0.42).
Conclusion: It was concluded that as smartphone addiction increases in students, musculoskeletal disorders increase. Smartphone addiction was particularly associated with the neck, shoulder, back, upper arm, wrist and hip regions. It was also concluded that smartphone addiction worsens sleep efficiency and general sleep quality and leads to sleep disturbance and daytime dysfunction.
Keywords: Smartphone addiction, Sleep quality, Musculoskeletal disorders, University students.

Üniverstite Öğrencilerinde Akıllı Telefon Bağımlılığı, Uyku Kalitesi ve Kas-İskelet Sistemi Rahatsızlıkları

ÖZ

Amaç: Akıllı telefon bağımlılığı birçok sağlık sorununa yol açabilir. Aşırı akıllı telefon kullanımı kas-iskelet sistemi bozuklukları ve uyku sorunlarıyla ilişkilendirilmiştir. Akıllı telefon bağımlılığı ile uyku kalitesi ve kas-iskelet sistemi rahatsızlıkları arasındaki ilişkiyi incelemeyi amaçladık. **Gereç ve Yöntem:** Bu kesitsel çalışmaya 60 üniversite öğrencisi dâhil edildi. Bireylerin akıllı telefon bağımlılığı, uyku kalitesi ve kas-iskelet sistemi bozuklukları sırasıyla Akıllı Telefon Bağımlılığı Ölçeği (ATBÖ), Cornell Kas İskelet Rahatsızlığı Ölçeği (CKİRÖ) ve Pittsburgh Uyku Kalitesi İndeksi (PUKİ) ile değerlendirildi. **Bulgular:** ATBÖ ile PUKİ'nin uyku etkinliği, uyku bozukluğu, gündüz işlev bozukluğu alt ölçekleri, PUKİ toplam puanı ve CKİRÖ'nün alt ekstremite ve omurga alt ölçekleri arasında zayıf bir korelasyon vardı (p=0.021, r=0.30; p=0.020, r=0.30; p=0.008, r=0.34; p=0.008, r=0.34; p=0.029, r=0.28; p=0.019, r=0.30). ATBÖ ve CKİRÖ üst ekstremite alt ölçeği ile CKİRÖ toplam puanı arasında iyi bir korelasyon vardı (p=0.001, r=0.43; p=0.001, r=0.42). **Sonuç:** Öğrencilerde akıllı telefon bağımlılığı arttıkça kas-iskelet sistemi rahatsızlıklarının da arttığı sonucuna varıldı. Akıllı telefon bağımlılığı özellikle boyun, omuz, sırt, üst kol, bilek ve kalça bölgeleriyle ilişkiliydi. Ayrıca akıllı telefon bağımlılığının uyku verimliliğini ve genel uyku kalitesini kötüleştirdiği, uyku bozukluğuna ve gündüz işlev bozukluğuna yol açtığı sonucuna varıldı.
Anahtar Kelimeler: Akıllı telefon bağımlılığı, Uyku kalitesi, Kas-iskelet sistemi rahatsızlıkları, Üniversite öğrencileri.

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INTRODUCTION

Smartphones have become a crucial aspect of daily life, and their excessive use concerns public health (Ding & Li, 2017). Although smartphones are used for socializing, spending time, and entertainment, their excessive use causes many problems (Kim, Min, Ahn, An & Lee, 2019). Smartphone addiction can be defined as insisting on using the smartphone despite all its adverse effects and not being able to control it (Mehrnaz et al., 2018). Smartphone addiction is behavioral (Cha & Seo, 2018). People with behavioral addictions repeat this behavior to obtain short-term pleasure despite knowing its harms (Grant, Potenza, Weinstein & Gorelick, 2010). As a result of uncontrolled use, physical problems, psychological problems and sleep problems may occur (Prithika, Biju, Prathipaa, Ponnusankar & Vishwas, 2022).

Smartphone addiction may lead to many health problems, and one of them is non-traumatic musculoskeletal pain. Excessive phone use is linked to repetitive joint movements, which can result in inflammatory changes within the joints (Megna et al., 2018). Forward head posture occurs during smartphone use. As a result, many postural problems, such as round shoulders and loose back, occur, which may cause pain in the musculoskeletal system. A study conducted in young people showed that moving the head, neck and shoulders forward during smartphone use may lead to increased stress in the neck area and premature tissue damage (Fares, Fares & Fares, 2017). In addition to sensitivity and decreased range of motion in the cervical region, it also causes muscle fatigue (Bueno, Garcia, Bertolini & Lucena, 2019). Poor posture resulting from phone use leads to neck discomfort and affects the proprioception of the region (Alsalameh, Harisi, Alduayji, Almutham & Mahmood, 2019; Dolan & Green, 2006).

Excessive use of smartphones continues even before falling asleep, which affects sleep quality and may lead to sleep problems. The phone screen's light can suppress the melatonin hormone secreted by the pineal gland and control the sleep and wakefulness cycle (Mehrnaz et al., 2018). Problematic use of computers and phones can affect sleep quality by reducing REM sleep, slow wave sleep, and sleep efficiency (Dworak et al., 2007). Additionally, spending the time that should be used for sleeping on the phone, the negative emotional, cognitive, and physiological effects of smartphones on the person, and the adverse effects of electromagnetic fields emitted from the phone in the bedroom at night negatively affect sleep quality (Cain & Gradisar, 2010). It is reported that sleep problems may lead to many issues, such as obesity and diabetes.

We aimed to observe the relationship between smartphone addiction, which is related to many health issues, and musculoskeletal disorders and sleep quality.

Our hypotheses are as follows:

H_0: There is no relationship between smartphone addiction, musculoskeletal disorders and sleep quality.

H_1: There is a relationship between smartphone addiction, musculoskeletal disorders and sleep quality.

MATERIALS AND METHODS

Participants

The study was conducted at Tokat Gaziosmanpaşa University. Sixty university students with smartphones were included in the study. The required sample size was calculated as 60 individuals, assuming a Type I error rate (α) of 0.05, a study power (β) of 0.85, an observed correlation coefficient (r) of 0.50 from the reference article (Mustafaoglu, Yasaci, Zirek, Griffiths & Ozdincler, 2021), and a negligible correlation coefficient (r) of 0.20 (Feise & Menke, 2001). After the participants were informed about the research, they were asked to fill out an informed consent form. In this cross-sectional study, individuals' smartphone addiction, musculoskeletal disorders and sleep quality were assessed with the Smartphone Addiction Scale (SAS), Cornell Musculoskeletal Discomfort Questionnaire (CMDQ), and the Pittsburgh Sleep Quality Index (PSQI), respectively. The surveys were filled out by the participants through face-to-face interviews. It took participants an average of 15 minutes to fill out the surveys. Students who used smartphones and agreed to participate in the study were included in the study. Students with any diagnosed chronic disease and without a smartphone were excluded from the study.

Outcome measures

Smartphone Addiction Scale - Short Form: *It* is a scale that measures the risk of smartphone addiction (Kwon, Kim, Cho & Yang, 2013). The scale has been translated into Turkish by Akın et al. (Akın, Altundağ, Turan & Akın, 2014). The scale consists of 10 items in total and has no subscales. Each item is scored between 1 and 6, and the total score varies between 10 and 60. As the total score increases, it means that the risk of addiction increases. In the Korean sample, cut-off scores are stated as 31 for men and 33 for women (Kwon, Kim, Cho & Yang, 2013).

Cornell Musculoskeletal Discomfort Questionnaire: It evaluates the feeling of pain and discomfort and the severity and impact of this feeling on the body parts (Hedge, Morimoto & Mccrobie, 1999). The questionnaire has been adapted to Turkish by Erdinç et al. (Erdinc, Hot & Ozkaya, 2011). CMDQ evaluates pain, ache, or discomfort in 12 parts of the body (neck, shoulder, upper back, upper arm, lower back, forearm, wrist, hip/buttocks, thigh, knee, lower leg, and foot) over 1 week. It examines the pain, ache and discomfort in these areas in terms of frequency, severity and interference with work. The score that can be obtained for each part of the body varies between 0 and 90 points. As the score increases, it

indicates that the severity of the problem increases. CMDQ total score is obtained by summing the scores of all sections.

Pittsburgh Sleep Quality Index: The index is used to assess sleep quality (Buysse, Reynolds, Monk, Berman & Kupfer, 1989). PSQI measures sleep quality over a one-month period. The scale, which consists of 24 questions, includes 19 self-report questions followed by 5 questions to be answered by the spouse or roommate. While the score of the scale is evaluated by calculating 18 items, items answered by the spouse or roommate are not included in the calculation. The scale consists of seven components: "Subjective sleep quality", "sleep latency", "sleep duration", "sleep efficiency", "sleep disturbance", "use of sleep medication" and "daytime dysfunction". Each item is evaluated between 0 and 3 points. The total score from the seven components determines the total score of the scale. The total score that can be obtained from the scale varies between 0 and 21. A total score of ≤5 indicates "good sleep quality", while a total score of >5 indicates "poor sleep quality". Its cultural adaptation into Turkish was tested by Ağargün et al. (Ağargün, Kara & Anlar, 1996).

Statistical analysis

Statistical analyses were conducted using Statistical Package for the Social Sciences (SPSS) version 22.0. Statistical data with normal distribution are presented as mean ± standard deviation, and statistical data with non-normal distribution are presented as median (25th-75th percentile). The Pearson and Spearman tests calculated normally and non-normally distributed data correlations, respectively. The Kolmogorov-Smirnov test was used for normality analysis. The Pearson correlation coefficient was interpreted as follows: 0.81 to 1.00 indicates excellent correlation, 0.61 to 0.80 very good correlation, 0.41 to 0.60 good correlation, 0.21 to 0.40 poor correlation, and 0 to 0.20 no correlation (Feise & Menke, 2001).

Ethic approval

Study permission was received from Tokat Gaziosmanpaşa University Social and Human Sciences Research Ethics Committee (date: 30.01.2024, session number: 02, decision: 01-65). The study complies with the principles of the Declaration of Helsinki. The data was collected between 01.02.2024 - 01.04.2024.

RESULTS

The demographics of the participants are shown in Table 1.

There was no correlation between SAS and PSQI's subjective sleep quality, sleep latency, sleep duration and use of sleep medication subscales (p=0.219, r=0.16; p=0.098, r=0.22; p=0.118, r=0.20; p=0.302, r=0.14). There was a weak correlation between SAS and PSQI's sleep efficiency, sleep disturbance, daytime dysfunction subscales, PSQI total score, and CMDQ's lower extremity and spine subscales (p=0.021, r=0.30; p=0.020, r=0.30; p=0.008, r=0.34; p=0.008, r=0.34; p=0.029, r=0.28; p=0.019, r=0.30). There was a well correlation between SAS and CMDQ's upper extremity subscale and CMDQ total score (p=0.001, r=0.43; p=0.001, r=0.42) (Table 2).

Table 1. The demographics of the participants.

	Mean±SD
Age (years)	22.33±1.19
Height (m)	1.69±0.10
Weight (kg)	67.98±14.46
BMI (kg/m^2)	23.54±3.68
Daily smartphone usage time (hours)	5.95±1.86
Age of starting to use a smartphone (years)	14.10±1.63
	n (%)
Gender	
Male	26(43.30)
Female	34(56.70)
Smoking	
Yes	19(31.70)
No	41(68.30)
Alcohol use	
Yes	1(1.70)
No	59(98.30)

BMI: Body mass index

Table 2. Correlations of SAS with PSQI and CMDQ.

	SAS	
	p	**r**
PSQI - Subjective sleep quality	0.219	0.16
PSQI - Sleep latency	0.098	0.22
PSQI - Sleep duration	0.118	0.20
PSQI - Sleep efficiency	**0.021**	**0.30**
PSQI - Sleep disturbance	**0.020**	**0.30**
PSQI - Use of sleep medication	0.302	0.14
PSQI - Daytime dysfunction	**0.008**	**0.34**
PSQI - Total Score	**0.008**	**0.34**
CMDQ - Upper Extremity	**0.001**	**0.43**
CMDQ - Lower Extremity	**0.029**	**0.28**
CMDQ - Spine	**0.019**	**0.30**
CMDQ - Total	**0.001**	**0.42**

Spearman test, SAS: Smartphone Addiction Scale, CMDQ: Cornell Musculoskeletal Discomfort Questionnaire, PSQI: Pittsburgh Sleep Quality Index

There was no correlation between SAS and CMDQ's lower back, forearm, thigh, knee, lower leg and foot subscales (p=0.371; p=0.108; p=0.065). There was a weak correlation between SAS and CMDQ's neck, upper back, shoulder, wrist, upper arm and hip/buttocks subscales (p=0.011; p=0.006; p=0.030; p=0.024; p=0.002; p=0.008) (Table 3).

Table 3. Correlations of SAS with CMDQ body parts.

	SAS	
	p	**r**
CMDQ – Neck	**0.011**	**0.33**
CMDQ – Shoulder	**0.006**	**0.35**
CMDQ – Upper back	**0.030**	**0.28**
CMDQ – Upper arm	**0.024**	**0.29**
CMDQ – Lower back	0.371	0.19
CMDQ – Forearm	0.108	0.21
CMDQ – Wrist	**0.002**	**0.39**
CMDQ – Hip/buttocks	**0.008**	**0.34**
CMDQ – Thigh	0.065	0.24
CMDQ – Knee	0.999	0.00
CMDQ – Lower leg	0.171	0.18
CMDQ – Foot	0.418	0.11

Spearman test, SAS: Smartphone Addiction Scale, CMDQ: Cornell Musculoskeletal Discomfort Questionnaire, PSQI: Pittsburgh Sleep Quality Index

SAS, PSQI and CMDQ scores are shown in Table 4.

Table 4. SAS, PSQI and CMDQ scores.

SAS	28.5(22-37.75)
PSQI - Subjective sleep quality	1(1-2)
PSQI - Sleep latency	1(1-2)
PSQI - Sleep duration	1(0-2)
PSQI - Sleep efficiency	0(0-0)
PSQI - Sleep disturbance	1(1-2)
PSQI - Use of sleep medication	0(0-0)
PSQI - Daytime dysfunction	1(0-2)
PSQI - Total Score	6(3.25-8)
CMDQ - Upper extremity	3.75(0-18)
CMDQ - Lower extremity	0(0-7.5)
CMDQ - Spine	7.5(4.5-21.13)
CMDQ - Total	16.5(6-46.13)

SAS: Smartphone Addiction Scale,
CMDQ: Cornell Musculoskeletal Discomfort Questionnaire, PSQI: Pittsburgh Sleep Quality Index

DISCUSSION

In the present study, the relationship between smartphone addiction, sleep quality and musculoskeletal disorders in students was examined, and it was seen that there may be a relationship between them. It was determined that as students' smartphone addiction increases, musculoskeletal disorders may increase and sleep quality may deteriorate. There has been a remarkable increase in smartphone usage over the last decade. This brings with it some physical and cognitive health problems. It was reported that excessive use of smartphones causes pain and discomfort, mainly in the neck, back and wrists. Mustafaoglu et al. in their study with young individuals, reported that the most discomfort was in the neck, back and wrists due to smartphone use (Mustafaoglu, Yasaci, Zirek, Griffiths & Ozdincler, 2021). Yang et al. in their study on adolescents, emphasized a correlation between smartphone use and neck, shoulder and back pain (Yang, Chen, Huang, Lin & Chang, 2017). Forward head posture, which frequently occurs when using a smartphone, may cause discomfort in the neck and back, and keeping the wrists in a fixed position for a long time may cause discomfort in the wrists. Similarly, in the current study, discomfort in the neck, back and wrists was associated with smartphone addiction. In addition, it was observed that disorders in the shoulder, hip and upper arm increased due to smartphone addiction. The position of the neck and back and the protraction of the shoulders due to the forward head posture may also cause discomfort in the shoulders and upper arms. Additionally, this poor posture may affect the spine and cause weakness in the abdominal muscles. Hip flexors may work harder than necessary to compensate for weakened abdominal muscles to provide stabilization. This mechanism may explain the relationship between smartphone addiction and hip disorders. Long-term smartphone use causes increased sedentary behavior. Sedentary lifestyle can also cause hip pain by causing the mentioned posture changes. A study reported that sedentary behavior reduces hip mobility and may cause hip-related morbidities (Javaid et al., 2022).

Wrists remain extended, elbows bent, and head forward for extended periods when using smartphones (Yang et al., 2017). These poor posture may cause tension in muscles, tendons, and discs, causing neck, shoulder, elbow, and wrist/hand pain (Kim, Cho, Park & Yang, 2015). In the current study, it was determined that the upper extremity, lower extremity, spine and total scores of CMDQ were associated with smartphone addiction. The increasing duration of smartphone use is a threat for lower back and lower back pain caused by sedentary behavior (Yang et al., 2017). Prolonged immobilization and incorrect posture are important risks for developing low back pain (Balagué, Troussier & Salminen, 1999). As a result of their study on university students, Alsalameh et al. reported that the most common pain due to smartphone addiction was in the neck, shoulder and lower back regions (Alsalameh et al., 2019). In the current study, there is no relationship between smartphone addiction and lower back discomfort. Our study group consisted of young people who were university students. Depending on their young age, the bad posture that has just been formed may not have existed long enough. For this reason, they may not be experiencing back pain at the moment. They may also experience lower back pain in the future due to prolonged poor posture caused by smartphone addiction. It has been reported that people use their smartphones more at night, which causes a decrease in sleep quality. Prithika et al. found that students with more smartphones had worse sleep

quality (Prithika et al., 2022). Nikolic et al. emphasized that there is a relationship between lousy sleep and smartphone addiction in medical students (Nikolic, Bukurov, Pavlović & Grujicic, 2023). In the current study, there was a relationship between students' smartphone addiction and their sleep quality. As smartphone addiction increases, sleep efficiency, sleep disturbance, daytime dysfunction and general sleep quality worsen. Due to smartphone use, bedtime may be delayed, and sleep time may decrease. Using smartphone instead of sleeping may reduce sleep efficiency by increasing time spent in bed but decreasing sleep time. Decreased sleep efficiency may cause the person to not be able to renew enough energy during sleep, causing difficulty in staying awake during the day, decreasing enthusiasm for daily activities, and ultimately causing daytime dysfunction. The habit of checking the phone repeatedly in smartphone addicts also activates the reward center and can negatively affect sleep quality (Hysing et al., 2015). It is also reported that long-term smartphone use may cause musculoskeletal disorders, which may negatively affect sleep quality (Thomée et al., 2011). Our study also showed that smartphone use may be associated with musculoskeletal disorders. In addition, the light emitted by the phone can disrupt the circadian rhythm and affect sleep patterns (LeBourgeois et al., 2017). All these reasons worsen the overall sleep quality. Additionally, excessive smartphone use may predispose to various psychological problems (e.g. depression) that are known to be related to sleep problems (Demirci, Akgönül, & Akpınar, 2015).

Limitations and Strengths

The current study has several limitations. Firstly, the study has a cross-sectional design; therefore, changes in smartphone addiction, musculoskeletal discomfort, and sleep quality over time were not observed. Secondly, as the study was conducted in a single center, our results cannot be generalized to the population. Further multicenter follow-up studies with larger sample groups are needed. The strength of the study is that, to our knowledge, it is the first study to examine smartphone addiction, sleep quality and musculoskeletal disorders together.

CONCLUSION

It was concluded that as smartphone addiction increases in students, musculoskeletal disorders increase. Smartphone addiction was particularly associated with the neck, shoulder, back, upper arm, wrist and hip regions. It was also concluded that smartphone addiction worsens sleep efficiency, sleep disturbance, daytime dysfunction and general sleep quality.

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Conflict of Interest

The author report there are no conflicts of interests to declare.

Author Contributions

Plan, design: EE; **Material, methods and data collection:** EE; Data **analysis and comments:** EE; **Writing and corrections:** EE.

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Ethical Approval

Institution: Tokat Gaziosmanpaşa University Social and Human Sciences Research Ethics Committee
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Investigation of Causes of Emergency Service Admission and Triage of the Newborn

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ABSTRACT
Objective: This study aimed to investigate the reasons for the emergency admission of the newborn. **Materials and Methods:** This study was conducted on the records of newborns aged 0-28 days (n=4212) admitted to the pediatric emergency department of a public hospital between 01.01.2020-31.12.2022. The analyses were performed using the SPSS 26.0 program. Descriptive data were presented as numbers, percentages, and mean, and categorical data were evaluated using the chi-square test. Significance level $p<0.05$ was accepted. **Results:** 28.9% (n=1217) of the applications were in 2020, 36.7% (n=1545) in 2021, and 34.4% (n=1450) in 2022. The number of applications increased in the fall months, and the most common diagnoses were healthy baby examinations and jaundice. Looking at the number of admissions over the years, it was determined that the number of 1-7-day admissions was higher in 2021 (χ^2=10.470, p=0.005), healthy infant examination showed a significant difference, jaundice was low in 2020, and admissions with restlessness and agitation increased in 2022 (χ^2=222.467, p=0.000). According to triage levels, it is seen that there are generally T3 applicants who receive a yellow area. In 2022, yellow area T2 applications increased, green area decreased in 2021, yellow area T3 increased in 2021 (χ^2=94.526; p=0.000), hospitalizations increased (χ^2=50.029, p=0.000), and deaths were high in 2020 (χ^2=7.388, p=0.025). **Conclusion:** Newborns use pediatric emergency departments significantly, and admissions increase, especially in the fall season. Admissions are generally more frequent due to healthy baby examinations and jaundice.
Keywords: Newborn, Emergency Service, Triage, Hospitalization.

Yenidoğanın Acil Servise Başvuru Nedenleri ve Triyaj İncelemesi

ÖZ
Amaç: Bu çalışmanın amacı yenidoğanın acil başvuru nedenlerinin incelenmesidir. **Gereç ve Yöntem:** Bu çalışma bir kamu hastanesi çocuk acil servisine 01.01.2020-31.12.2022 tarihleri arasında başvuran 0-28 günlük (n=4212) yenidoğanların kayıtları üzerinden gerçekleştirilmiştir. Analizler SPSS 26.0 programı kullanılarak, tanımlayıcı veriler sayı, yüzde ortalama ile sunulmuş, kategorik veriler ki kare testi kullanılarak değerlendirilmiştir. Anlamlılık düzeyi $p<0.05$ kabul edilmiştir. **Bulgular:** Başvuruların %28.9'u (n=1217) 2020 yılında, %36.7'si (n=1545) 2021 yılında, %34.4'ü (n=1450) 2022 yılında olmuştur. Başvurular sonbahar aylarında artış göstermekte, en sık görülen tanıların sağlıklı bebek muayenesi ve sarılık olduğu görülmektedir. Yıllar içinde başvurusu sayısına bakıldığında 2021 yılında 1-7 günlük başvuruların daha fazla olduğu (χ^2=10.470, p=0.005), sağlıklı bebek muayenesinin anlamlı farklılık gösterdiği, sarılığın ise 2020 yılında düşük olduğu, huzursuzluk, ajitasyon ile başvuruların 2022 yılında arttığı (χ^2=222.467, p=0.000) belirlenmiştir. Triyaj düzeylerine göre genellikle Sarı alan T3 başvurusunun olduğu görülmektedir. 2022 yılında sarı alan T2 başvuruların arttığı, yeşil alanın 2021 yılında düştüğü, 2021 yılında sarı alan T3 arttığı (χ^2=94.526; p=0.000) hastaneye yatışların arttığı (χ^2=50.029, p=0.000), 2020 yılında ölümlerin yüksek olduğu (χ^2=7.388, p=0.025), görülmektedir. **Sonuç:** Yenidoğanlar çocuk acil servislerini önemli ölçüde kullanmakta olup özellikle sonbahar mevsiminde başvurular artmaktadır. Başvurular sağlıklı bebek muayenesi ve sarılık nedeniyle başvurular daha sık olmaktadır.
Anahtar Kelimeler: Yenidoğan, Acil Servis, Triyaj, Hastaneye Yatış.

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INTRODUCTION

Although the newborn period includes the first 28 days of life (Bozlu et al., 2018; Ferreira et al., 2018; Eser et al., 2021), it is the period when the baby tries to adapt to extrauterine life, experiences physiological changes, and is the most vulnerable (Bozlu et al., 2018; Eser et al., 2021; Güneş et al., 2022). Most of the deaths observed in the first year of life occur during this period when the baby is vulnerable (Bozlu et al., 2018; Güneş et al., 2022). This period is characterized by high morbidity and mortality rates (Bozlu et al., 2018; Yang & Meng, 2019). Newborn morbidity and mortality rates reflect a country's socioeconomic development and health status and provide clues about the health system (Yang & Meng, 2019; Güneş et al., 2022). Newborn survival is closely related to access to health services. Most unpreventable events, such as congenital anomalies in developed countries, and preventable conditions, such as morbidity, infections, and preterm births in developing countries, affect newborn health (Yang & Meng, 2019). Within the scope of the Sustainable Development Goals, this critical issue affecting all countries is aimed at reducing the newborn mortality rate to at least 12 per 1000 live births in all countries by 2030 (United Nations, 2016). It is reported that newborns' emergency room visits increase disproportionately faster than older infants (Blakey et al., 2021; Turan et al., 2021). In a study conducted in Turkey, the rate of newborn admissions in the last 1 year was 1.5% of all pediatric admissions (Eser et al., 2021). In Bozlu et al. (2018) study, it was 1.9% and in Pervane et al. (2024) study, the rate of newborns brought to the hospital by 112 was found to be 0.01%. It is reported that 1.6% of pediatric emergency department admissions in Spain are newborns (Montero et al., 2021), and 2.5-5.7% of pediatric emergency department admissions in Italy are newborns (Silvagni et al., 2021). Parents generally prefer emergency departments when there is any problem with the newborn, whether urgent or not, during the newborn period (Bozlu et al., 2018). Although no pathologic cause is usually found in pediatric emergency department admissions of newborns, it is seen that they apply due to jaundice, bacterial infections, and other serious problems (Eser et al., 2021). Pediatric emergency departments are hospital units that provide uninterrupted 24-hour service (Karakaş et al., 2020), and healthcare professionals triage the applicants to determine the priority and appropriate treatment units. In triage, healthcare workers measure the vital signs of the newborn and ask the parents/caregivers who brought the newborn to the emergency department about the medical history of the baby, including the birth history and the reason for bringing the baby to the emergency department (Ministry of Health, 2022). The hospitalization rate is also higher in cases of readmission to the emergency department within the first 24-72 hours (Akçay & Gül, 2022). Hospitalization is a severe stressor for both the family and the infant and leads to an increase in health expenditures in countries. However, emergency room admissions can be prevented by anticipating possible risks and taking simple measures accordingly (Güneş et al., 2022). Examining the reasons that bring the newborn to the emergency department and evaluating the triage status is essential in providing evidence to decision-makers and healthcare professionals in the future. Although the use of health services by adults or children has been investigated, studies on the use of health services by newborns are limited (Bozlu et al., 2018; Eser et al., 2021).

This study aimed to examine the change in newborns admitted to the pediatric emergency department of a public institution over the years, frequency of admission, reasons for admission, and triage.

MATERIALS AND METHODS

Study group

This is a retrospective study based on the data of 0-28-day-old newborns (n=4212) admitted to the Pediatric Emergency Department of Istanbul Göztepe Prof. Dr. Süleyman Yalçın City Hospital between 01.01.2020-31.12.2022. In the study, the exclusion criteria were that the baby was not in the newborn period, there was missing data in the records, or could not be reached. No sampling was performed in the study, and all 0-28-day-old newborns admitted to the Pediatric Emergency Department of Istanbul Göztepe Prof. Dr. Süleyman Yalçın City Hospital between 01.01.2020 and 31.12.2022 who met the criteria were included in the study.

Dependent and independent variables

The study's dependent variables were newborn admissions by years and triage classification of admissions. Age, gender, diagnosis, hospitalization status, health insurance, nationality, forensic case status, and death status of the newborn were considered independent variables.

Procedures

The data were obtained through the patient information system with the hospital's permission. After the data were anonymized, the newborn emergency department visits between 01.01.2020 and 31.12.2022 were collected as a list.

Statistical analysis

The data obtained from the hospital were transferred to the Statistical Package for Social Science (SPSS) 26 program and analyzed. Descriptive data were presented with frequency, percentage, mean, and standard deviation values. The chi-square test was used in univariate analyses. Significance level $p<0.05$ was accepted.

Ethical considerations

In this study, the rules of the Declaration of Helsinki were followed, permission was obtained from the ethics committee of Balıkesir University Health Sciences Non-Interventional Research (Date: 06.12.2022, Approval No: 2022/118), and permission

was obtained from the chief physician of Istanbul Göztepe Prof. Dr. Süleyman Yalçın City Hospital (Date: 26.01.2023, Number: 2023/01).

RESULTS

The study group consisted of 4212 0-28-day-old applicants admitted between 01.01.2020 and 31.12.2022. Of these admissions, 28.9% (n=1217) occurred in 2020, 36.7% (n=1545) in 2021, and 34.4% (n=1450) in 2020. The study group's mean age (days) was 12.15±8.02, 11.84±8.23, and 12.71±8.33 in 2020, 2021, and 2022, respectively. The rates of newborns admitted at 0-7 days of age were 38.7%, 42.3%, and 36.6% in 2020, 2021, and 2022, respectively, while the rates of admission in the female gender were 50.0%, 49.5%, and 51.5%, respectively.

The most common diagnoses were healthy infant examination and jaundice. In 2020, 2021, and 2022, the rates for healthy baby examination were 44.4%, 36.5%, and 25.6%, respectively, while the rates for jaundice were 26.7%, 30.6%, and 32.1%, respectively. According to the triage levels, most of the admissions were Yellow area T3 (Vital signs are stable), which was 70.4%, 79.0%, and 68.1% in 2020, 2021, and 2022, respectively. In 2020, 2021, and 2022, hospitalization rates are 6.3%, 8.0%, and 13.9% respectively. The proportion of applicants with SSI was 97.5%, 96.4%, 97.2%, the proportion of applicants with Turkish citizenship was 98.3%, 98.0%, 98.2%, the proportion of applicants with forensic cases was 0.2%, 0.1%, 0.2%, and the proportion of applicants who died was 0.2% only in 2020 (Table 1).

Table 1. Sociodemographic characteristics of the study group (n=4212).

Variables	2020		2021		2022	
	X	SD	X	SD	X	SD
Age (Day)	12.15	8.02	11.84	8.23	12.71	8.33
	n	%	n	%	n	%
Age (Day)						
0-7	471	38.7	653	42.3	530	36.6
8-14	312	25.6	358	23.2	357	24.6
15-21	222	18.2	243	15.7	275	19.0
22-28	212	17.4	291	18.8	288	19.9
Gender						
Female	608	50.0	765	49.5	747	51.5
Male	609	50.0	780	50.5	703	48.5
Diagnosis						
Healthy baby examination	540	44.4	564	36.5	371	25.6
Jaundice	325	26.7	472	30.6	465	32.1
Restlessness, agitation	45	3.7	51	3.3	80	5.5
Fever	20	1.6	23	1.5	65	4.5
Urinary tract infections	11	0.9	8	0.5	10	0.7
Nutritional problems of the newborn	3	0.2	12	0.8	9	0.6
Aspiration of milk and food by the newborn	3	0.2	17	1.1	0	0.0
Conjunctivitis	15	1.2	13	0.8	19	1.3
Respiratory tract infections						
Acute upper respiratory tract infections	21	1.7	48	3.1	76	5.2
Cough	24	2.0	33	2.1	45	3.1
Gastrointestinal system causes						
Nausea, vomiting	38	3.1	41	2.7	31	2.1
Abdominal pain	21	1.7	22	1.4	41	2.8
Constipation	27	2.2	17	1.1	22	1.5
Intestinal gas and related conditions	18	1.5	32	2.1	14	1.0
Gastroenteritis and colitis non-infective	16	1.3	12	0.8	19	1.3
Dermatological causes						
Dermatitis	16	1.3	30	1.9	35	2.4
Soft tissue disorders	2	0.2	10	0.6	12	0.8
Bleeding related causes						
Umbilical hemorrhage	9	0.7	12	0.8	10	0.7
Bleeding	5	0.4	24	1.6	18	1.2
Other*	57	4.7	104	6.7	108	7.4
Triage level						
Red area T1	4	0.3	5	0.3	2	0.1
Yellow area T2 (vital signs impaired)	73	6.0	120	7.8	186	12.8
Yellow area T3 (Vital signs stable)	857	70.4	1220	79.0	987	68.1
Green area T4	283	23.3	200	12.9	275	19.0

Table 1 (Continued). Sociodemographic characteristics of the study group (n=4212).

Variables	2020		2021		2022	
	n	%	n	%	n	%
Hospitalization						
No	1140	93.7	1421	92.0	1249	86.1
Yes	77	6.3	124	8.0	201	13.9
Health insurance						
SSI	1187	97.5	1490	96.4	1409	97.2
Other**	30	2.5	55	3.6	41	2.8
Nationality of the applicant						
Turkish Citizen	1196	98.3	1514	98.0	1424	98.2
Other***	21	1.7	31	2.0	26	1.8
Forensic case						
Yes	2	0.2	1	0.1	3	0.2
No	1215	99.8	1544	99.9	1447	99.8
Death						
Yes	3	0.2	0	0.0	0	0.0
No	1214	99.8	1545	100.0	1450	100.0

X: Mean, **SD:** Standard deviation. * Myalgia, ileus, cystic fibrosis, cleft palate, thrombocytopenia, **Paid, temporary protection, health tourism, ***Syrian Arab Republic, Uzbekistan, Turkmenistan, Great Britain.

When the distribution of admissions by months in the research group is examined, it is seen that the total of 4212 admissions varied between 44-213 per month; there was an average of 117 newborn admissions per month, and admissions increased in the fall months (Figure 1).

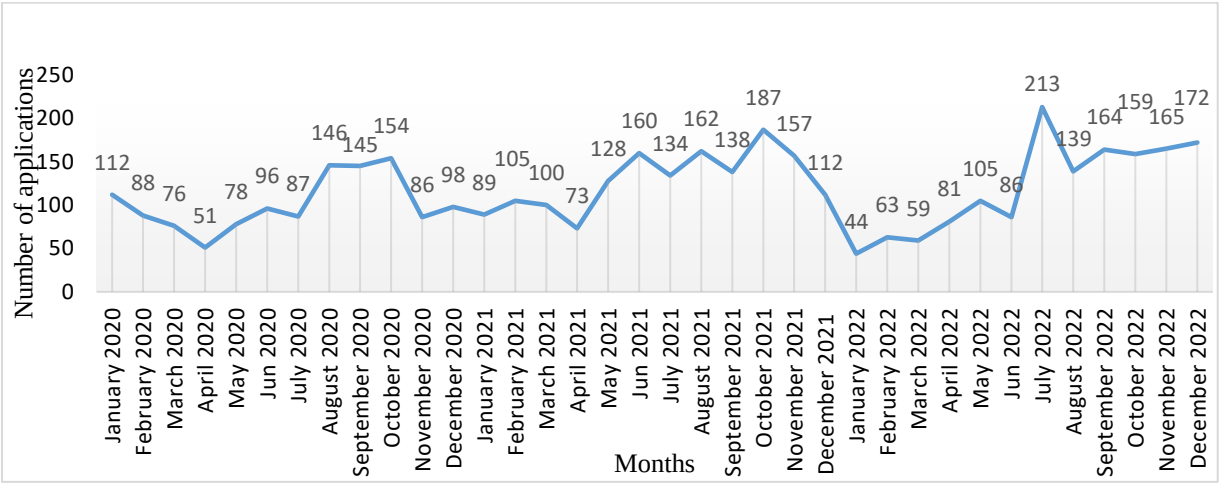

Figure 1. Number of examinations by month.

When the most common diagnoses in the study group are analysed, it is seen that the most common diagnoses are healthy baby examination and jaundice.When we look at the number of admissions in the research group over the years according to some variables, it is seen that 1-7 days old admissions were more in 2021 (χ^2=10.470, p=0.005), healthy infant examination showed a significant difference, jaundice was low in 2020, restlessness and agitation increased in 2022 (χ^2=222.467, p=0.000), according to triage, yellow area T2 (vital signs deteriorated) admissions increased in 2022, green area decreased in 2021, yellow area T3 (vital signs stable) increased in 2021 (χ^2=94.526, p=0.000) hospitalizations increased (χ^2=50.029, p=0.000), deaths were high in 2020 (χ^2=7.388, p=0.025). There is no statistically significant difference (p>0.05) according to gender, health insurance, nationality of the applicant, and forensic case status (Table 2).

Table 2. Changes in admissions over the years according to some sociodemographic variables (n=4212).

Variables	Year			Test value/p
	2020	2021	2022	
	n (%)	n (%)	n (%)	
Age				
1-7 days	471 (28.5)	653 (39.5)	530 (32.0)	χ^2=10.470
8-28 days	746 (29.2)	892 (34.9)	920 (36.0)	**p=0.005**
Gender				
Female	608 (28.7)	765 (36.1)	747 (35.2)	χ^2=1.296
Male	609 (29.1)	780 (37.3)	703 (33.6)	p=0.523
Diagnosis				
Healthy baby examination	540 (36.6)	564 (38.2)	371 (25.2)	
Jaundice	325 (25.8)	472 (37.4)	465 (36.8)	
Restlessness, agitation	45 (25.6)	51 (29.0)	80 (45.5)	
Hyperthermia (fever)	20 (18.5)	23 (21.3)	65 (60.2)	
Urinary tract infections	11 (37.9)	8 (27.6)	10 (34.5)	
Nutritional problems of the newborn	4 (16.0)	12 (48.0)	9 (36.0)	
Aspiration of milk and food by the newborn	3 (15.0)	17 (85.0)	0 (0.0)	
Conjunctivitis	15 (31.9)	13 (27.7)	19 (40.4)	
Acute upper respiratory tract infections	21 (14.5)	48 (33.1)	76 (52.4)	
Cough	24 (23.5)	33 (32.4)	45 (44.1)	χ^2=222.467
Nausea, vomiting	38 (34.5)	41 (37.3)	31 (28.2)	**p=0.000**
Abdominal pain	21 (25.0)	22 (26.2)	41 (48.8)	
Constipation	27 (40.9)	17 (25.8)	22 (33.3)	
Intestinal gas and related conditions	18 (28.1)	32 (50.0)	14 (21.9)	
Gastroenteritis and colitis non-infective	16 (34.0)	12 (25.5)	19 (40.4)	
Dermatitis	16 (19.8)	30 (37.0)	35 (43.2)	
Soft tissue disorders	2 (8.3)	10 (41.7)	12 (50.0)	
Umbilical hemorrhage	9 (29.0)	12 (38.7)	10 (32.3)	
Bleeding	5 (10.6)	24 (51.1)	18 (38.3)	
Other*	57 (21.2)	104 (38.7)	108 (40.1)	
Triage type				
Red area T1	4 (36.4)	5 (45.5)	2 (18.2)	χ^2=94.526
Yellow area T2 (vital signs impaired)	73 (19.3)	120 (31.7)	186 (49.1)	**p=0.000**
Yellow area T3 (Vital signs stable)	857 (28.0)	1220 (39.8)	987 (32.2)	
Green area T4	283 (37.3)	200 (26.4)	275 (36.3)	
Hospitalization				
No	1140 (29.9)	1421 (37.3)	1249 (32.8)	χ^2=50.029
Yes	77 (19.2)	124 (30.8)	201 (50.0)	**p=0.000**
Health insurance				
SSI	1187 (29.1)	1490 (36.5)	1409 (34.5)	χ^2=3.016
Other**	30 (23.8)	55 (43.7)	41 (32.5)	p=0.221
Nationality of the applicant				
Turkish citizen	1196 (28.9)	1514 (36.6)	1424 (34.4)	χ^2=0.338
Other***	21 (26.9)	31 (39.7)	26 (33.3)	p=0.845
Forensic case				
Yes	2 (33.3)	1 (16.7)	3 (50.0)	χ^2=1.121
No	1215 (28.9)	1544 (36.7)	1447 (34.4)	p=0.571
Death				
Yes	3 (100.0)	0 (0.0)	0 (0.0)	χ^2=7.388
No	1214 (28.8)	1545 (36.7)	1450 (34.4)	**p=0.025**

* Myalgia, ileus, cystic fibrosis, cleft palate, thrombocytopenia. **Paid, temporary protection, health tourism. ***SyrianArab Republic, Uzbekistan, Turkmenistan, Great Britain.

When we look at how the triage classification changed according to some variables in the research group, it was found that the number of newborns with T1 triage was low (χ^2=15.832, p=0.001), yellow area T2 (vital signs deteriorated) admissions increased in 2022 according to triage, green area decreased in 2021, yellow area T3 (vital signs stable) admissions increased in 2021 (χ^2=95. 711, p=0.000), jaundice was more common in T3, healthy infant examination was more common in T3, (χ^2=830.604, p=0.000), there were more hospitalizations in T4 compared to others (χ^2=1859. 567, p=0.000), forensic cases were

higher in T1 (χ^2=574.739, p=0.000), and deaths were higher in T1 (χ^2=511.614, p=0.000).

There is no statistically significant difference according to gender, health insurance, nationality of the applicant (p>0.05) (Table 3).

Table 3. Variation of Triage status according to some sociodemographic variables (n=4212).

Variables	Triage level				Test value/p
	T1	T2	T3	T4	
	n (%)	n (%)	n (%)	n (%)	
Age					
1-7 days	5 (0.3)	117 (7.1)	1247 (75.4)	285 (17.2)	χ^2=15.832
8-28 days	4 (0.2)	262 (10.2)	1817 (71.0)	475 (18.6)	**p=0.001**
Gender					
Female	3 (0.1)	184 (8.7)	1574 (74.2)	359 (16.9)	χ^2=5.757
Male	6 (0.3)	195 (9.3)	1490 (71.2)	401 (19.2)	p=0.124
Year of application					
2020	2 (0.2)	73 (6.0)	857 (70.4)	285 (23.4)	χ^2=95.711
2021	5 (0.3)	120 (7.8)	1220 (79.0)	200 (12.9)	**p=0.000**
2022	2 (0.1)	186 (12.8)	987 (68.1)	275 (19.0)	
Diagnosis					
Healthy baby examination	5 (0.3)	106 (7.2)	971 (65.8)	393 (26.6)	
Jaundice	1 (0.1)	46 (3.6)	1118 (88.6)	97 (7.7)	
Restlessness, agitation	0 (0.0)	18 (10.2)	137 (77.8)	21 (11.9)	
Fire	0 (0.0)	50 (46.3)	17 (15.7)	7 (24.1)	
Urinary tract infections	0 (0.0)	5 (17.2)	17 (58.6)	7 (24.1)	
Nutritional problems of the newborn	0 (0.0)	11 (44.0)	8 (32.0)	6 (24.0)	
Aspiration of milk and food by the newborn	1 (5.0)	7 (35.0)	4 (20.0)	8 (40.0)	
Conjunctivitis	0 (0.0)	1 (2.1)	45 (95.7)	1 (2.1)	
Acute upper respiratory tract infection	0 (0.0)	16 (11.0)	113 (77.9)	16 (11.0)	
Cough	0 (0.0)	13 (12.7)	66 (64.7)	23 (22.5)	χ^2=830.604
Nausea, vomiting	0 (0.0)	7 (14.9)	31 (66.0)	9 (19.1)	**p=0.000**
Abdominal pain	1 (1.2)	4 (4.8)	31 (36.9)	48 (57.1)	
Constipation	0 (0.0)	1 (1.5)	59 (89.4)	6 (9.1)	
Intestinal gas and related conditions	0 (0.0)	1 (1.6)	61 (95.3)	2 (3.1)	
Gastroenteritis and colitis non-infective	0 (0.0)	7 (14.9)	31 (66.0)	9 (19.1)	
Dermatitis	0 (0.0)	6 (7.4)	68 (84.0)	7 (8.6)	
Soft tissue disorders	0 (0.0)	2 (8.3)	21 (87.5)	1 (4.2)	
Umbilical hemorrhage	0 (0.0)	0 (0.0)	31 (100.0)	0 (0.0)	
Bleeding	0 (0.0)	2 (4.3)	43 (91.5)	2 (4.3)	
Other*	3 (1.1)	60 (22.3)	161 (59.9)	45 (16.7)	
Hospitalization					
Yes	2 (0.5)	12 (3.0)	0 (0.0)	388 (96.5)	χ^2=1859.567
No	7 (0.2)	367 (9.6)	3064 (80.4)	372 (9.8)	**p=0.000**
Patient nationality					
Turkish Citizen	9 (0.2)	367 (8.9)	3012 (72.9)	746 (18.0)	χ^2= 4.176
Other**	0 (0.0)	12 (15.4)	52 (66.7)	14 (17.9)	p=0.243
Social security					
SSI	8 (0.2)	364 (8.9)	2976 (72.8)	738 (18.1)	χ^2=3.439
Other***	1 (0.8)	15 (11.9)	88 (69.8)	22 (17.5)	p=0.329
Forensic case					
Yes	3 (50.0)	1 (16.7)	0 (0.0)	2 (33.3)	χ^2=574.739
No	8 (0.2)	378 (9.0)	3064 (72.8)	756 (18.0)	**p=0.000**
Death					
Yes	2 (66.7)	1 (33.3)	0 (0.0)	0 (0.0)	χ^2=511.614
No	9 (0.2)	378 (9.0)	3064 (72.8)	758 (18.0)	**p=0.000**

T1: Red area, T2: Yellow area (vital signs impaired), T3: Yellow area (vital signs normal), T4: Green area.
* Myalgia, ileus, cystic fibrosis, cleft palate, thrombocytopenia.
**SyrianArab Republic, Uzbekistan, Turkmenistan, Great Britain.
***Paid, temporary protection, health tourism.

DISCUSSION

Newborns are very vulnerable (Montero et al., 2021; Turan et al., 2021) and need continuous care. Parents should know sufficiently about newborn infant care (Turan et al., 2021). Newborns are admitted to the emergency department due to factors such as parental anxiety, and inadequate primary care support, early

postpartum discharge, and the number of newborns admitted to the emergency department is increasing (Batu et al., 2015; Ferreira et al., 2018; Turan et al., 2021). This study examined the reasons for newborns' admission to the emergency department. In our study, a change was observed in the emergency room visits of newborns over the years. This change may be related to the pandemic period. Notably, there were 3 newborn deaths in the year with the lowest hospitalization rate. During this period, applications to the emergency department may have been postponed due to practices such as curfews. While the hospitalization rate of newborns admitted to the emergency department was higher in our study compared to some studies conducted in our country (Akçay & Gül, 2022; Güneş et al., 2022; Karakaş et al., 2020), it is similar to some studies (Eser et al., 2021; Turan et al., 2021; Pervane et al., 2024). The variability of hospitalization rates in the studies may be due to differences in the reasons for admission. Emergency services are consulted when there is any problem related to the newborn, whether it is an emergency or not. In our study, similar to other studies, it was observed that most of the emergency department visits of our newborn babies were due to non-emergency reasons (Batu et al., 2015; Blakey et al., 2021; Ferreira et al., 2018; Pehlivanturk-Kizilkan et al., 2022; Turan et al., 2021). During emergency department visits, newborns may be exposed to a high risk of infection (Bonadio & Oliveira, 2019; Silvagni et al., 2021) and may increase the risk of transmission for other family members (Silvagni et al., 2021). In addition, nonurgent admissions can lead to patient overcrowding, stressful conditions for healthcare staff, and delays in care delivery. Consequently, they lead to less attention to urgent cases and create dissatisfaction among health professionals and service users (Morrison et al., 2014; Montoro-Pérez et al., 2023). However, every patient seen in the hospital generates a cost, regardless of the case's complexity, and the resources wasted on unnecessary admissions could be used for alternative investments to improve service quality (Bonadio & Oliveira, 2019). Regarding inappropriate use of the service, low health literacy of parents (Morrison et al., 2014; Montoro-Pérez et al., 2023), the impact of social networks, lack of fast access to computer services, and the advantages of pediatric emergency departments (PEDs) such as convenient working hours, accessibility, ease of diagnostic tests and consultation with specialists compared to outpatient services are seen as the reasons for emergency department visits (Montoro-Pérez et al. 2023).

Factors affecting the admission of newborns to the emergency department include primiparity, young maternal age, race, income, and education levels of the mother and father (Batu et al., 2015; Bonadio & Oliveira, 2019), lack of maternal income, (Pehlivanturk-Kizilkan et al., 2022), early postpartum discharge, being a single mother, caregivers having insufficient knowledge about the newborn, (Bonadio & Oliveira 2019; Montero et al., 2021), maternal occupation, premature birth, number of children, birth weight of the newborn (Montero et al., 2021). A study conducted in Brazil stated that using educational interventions for mothers in the delivery room reduces the number of emergency room visits of newborns (Bonadio & Oliveira 2019).

Neonatal hyperbilirubinemia (or neonatal jaundice) is a common condition in the newborn period, especially in the first 2 weeks of birth, and affects approximately 60-80% of newborns worldwide (Yan et al., 2022). In this study, the most common diagnoses in newborns admitted to the emergency department were healthy baby examination followed by jaundice, with 26.7%, 30.6%, and 32.1% in 2020, 2021, and 2022, respectively. Notably, while healthy infant examination has decreased over the years, jaundice has increased. In studies conducted in Izmir and Ankara, jaundice was determined as the most common diagnosis of newborn emergency department admission (Batu et al., 2015; Güneş et al., 2022; Pervane et al., 2024). In the study conducted by Batu et al. to determine the characteristics of PED visits in newborns (≤ 28 days old infants) and to evaluate the factors affecting them, the most common diagnoses were normal newborn, indirect hyperbilirubinemia, and infantile colic. It was reported that 23.2% of 531 infants were hospitalized, and 37.3% of the hospitalized infants had indirect hyperbilirubinemia, pneumonia, and sepsis (Batu et al., 2015). Smartphone applications have been shown to have satisfactory accuracy in screening newborn bilirubin levels. In a randomized controlled study involving 1187 mothers and infants in China, it was found that the intervention group using a smartphone-based out-of-hospital neonatal jaundice screening program reduced the rate of newborn readmission by 10.5% within 30 days from the first discharge compared to the control group and reduced the mean maternal anxiety score by 3.6 (Yan et al., 2022). In today's world, where technology is developing rapidly, the accessibility of smartphones and the increased use of web-based applications under the guidance of pediatricians in newborn health services can prevent emergency room admissions of newborns with non-acute causes.

When the distribution of admissions by season was examined, we found that newborns were more likely to apply to the emergency department in the fall season. In a retrospective study conducted in Izmir, it was also found that newborns were more likely to apply to the emergency department in the fall season (Güneş et al., 2022). As a result of the precautions, quarantine, and isolation procedures taken during the coronavirus disease pandemic, which was the period included in the study, it was thought that the frequency of viral infections in newborn babies decreased in the winter period, as in other children. A study in Italy concluded that newborn admissions to

the emergency department for feeding problems were frequent during the pandemic period and that this surprising data may be partly due to limited access to primary care services and, in addition, mandatory home isolation may limit the ability of inexperienced parents to seek advice from relatives and friends and increase anxiety and concerns about the best management for their infants (Silvagni et al., 2021). The Korean study showed that the COVID-19 pandemic affected the number of newborns visiting the emergency department, with a significant decrease in emergency department visits, especially for newborns 7 days old or younger (Lee et al., 2024). The younger the babies are admitted to the emergency department, the more likely they will be expected to be healthy newborns. Babies ≤ 14 days of age are reported to use the emergency department more, but this group usually does not require emergency care and has lower hospitalization rates. In a study conducted in Izmir, most of the patients (77.7%) were aged ≤ 14 days, and 72.9% did not have an emergency (Turan et al., 2021). Similarly, our study observed that newborns ≤7 days of age were frequently admitted according to years. Increased anxiety and fear of parents, early discharge after delivery, and lack of information about postnatal care may explain this situation. However, the triage ranking was higher in admissions older than 8 days. In a study examining the time of first admission of newborns to the emergency department in Portugal, it was reported that 85 newborns (32%) were admitted in the first week of life, 72 (27%) in the second week, and 61 (23%) in the third week (Ferreira et al., 2018). A retrospective study of newborn admissions to the pediatric emergency department in the U.K. found that the most common reasons for admission were difficulty in breathing, vomiting, and malnutrition. The most common diagnosis was 'no significant medical problem' (42%). Those with no significant medical problems were likelier to be <14 days old and had a lower triage category (Blakey et al., 2021).

Patients admitted to emergency departments are triaged by the healthcare personnel on duty to determine their medical priorities and the treatment units to which they will be directed, taking into account their complaints about their diseases, the severity of their symptoms, and the urgency of their medical conditions (Ministry of Health, 2022). This study shows that the yellow area admissions were the most common according to years. They were frequently referred to yellow areas with diagnoses such as jaundice, restlessness, agitation, and high fever. In a study conducted in Italy, it was reported that non-emergency admissions decreased during the pandemic period, while green (postponable emergency) and yellow area admissions (for emergency) increased (Silvagni et al., 2021).

Limitations and Strengths

One of the critical limitations of our study is that it was single-center, and the data were retrospectively obtained through the hospital information system. In the newborn period, factors belonging to the mother and factors belonging to the infant may also affect the rate of emergency department visits. Since not all detailed data on mothers were available in the data, we could not examine the extent to which maternal factors affect the rate of emergency department visits in our study.

CONCLUSION

In conclusion, our study shows that a significant proportion of cases in the neonatal period were brought to pediatric emergency departments within the first week, admissions due to jaundice increased over the years, and admissions with stable vital signs were more frequent. Because of these results, non-acute emergency department visits in our study were due to inadequate caregiver knowledge about newborn care. Educating parents and newborn caregivers about the conditions that should be referred to the emergency department and management of jaundice may prevent unnecessary visits to the emergency department and ensure the effective delivery of healthcare services. Increasing primary care support and making home visits in the first one-week period may be recommended.

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Conflict of Interest

The author states that there are no potential conflicts of interest regarding the research, authorship, or publication of this article.

Author Contributions

Plan, design: EC**; Material, methods and data collection:**EC, GE**; Data analysis and comments:** EC, GE**; Writing and corrections:**EC, GE**.**

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Ethical Approval

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Microbiological Quality Assessment of Meatball Samples Collected from Businesses with Different Pricing Strategies

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ABSTRACT
Objective: The purpose of this study was to evaluate the microbiological quality of meatball samples collected from establishments employing different pricing strategies. **Materials and Methods:** Samples were obtained from low-priced establishments (Business I) and high-priced establishments (Business II) and were analyzed for total aerobic mesophilic bacteria (TAMB), yeasts and molds, coliform bacteria, *Staphylococcus aureus*, *Escherichia coli*, *Salmonella* spp., and *Listeria monocytogenes*. **Results:** Both groups of samples complied with Turkish Food Codex standards for TAMB and *S. aureus*, while yeast and mold count in Business I samples exceeded the permissible limits. *Salmonella* spp. was detected in 3.3% of the samples from Business I and 6.6% from Business II, whereas *L. monocytogenes* was not detected in any of the samples. **Conclusion:** The study findings showed that there was no significant difference in microbiological quality between the two groups, except for yeast and mold counts. It was also concluded that there was no direct relationship between product price and hygienic quality.
Keywords: Food Pricing Strategies, Hygienic Quality, Meatball, Microbiological Quality.

Farklı Fiyatlandırma Stratejilerine Sahip İşletmelerden Alınan Köfte Örneklerinin Mikrobiyolojik Kalite Değerlendirmesi

ÖZ
Amaç: Bu çalışmanın amacı farklı fiyatlandırma stratejileri uygulayan işletmelerden toplanan köfte örneklerinin mikrobiyolojik kalitesinin değerlendirilmesidir. **Gereç ve Yöntem:** Düşük fiyatlı işletmelerden (İşletme I) ve yüksek fiyatlı işletmelerden (İşletme II) alınan örnekler, toplam aerobik mezofilik bakteri (TAMB), maya ve küf, koliform bakteriler, *Staphylococcus aureus*, *Escherichia coli* ve *Salmonella* spp. ve *Listeria monocytogenes* varlığı açısından analiz edilmiştir. **Bulgular:** Her iki grup örnek de TAMB ve *S. aureus* açısından Türk Gıda Kodeksi standartlarını karşılarken, İşletme I örneklerindeki maya ve küf sayıları limitleri aşmıştır. *Salmonella* spp. pozitifliği İşletme I örneklerinin %3,3'ünde ve İşletme II örneklerinin %6,6'sında tespit edilmiştir. Hiçbir örnekte *L. monocytogenes* tespit edilmemiştir. **Sonuç:** Çalışma bulguları maya ve küf sayıları dışında, iki grup arasında mikrobiyolojik kalitede anlamlı bir fark olmadığını gösterdi. Ayrıca, ürün fiyatı ile hijyenik kalite arasında doğrudan bir ilişki olmadığı sonucuna varılmıştır.
Anahtar Kelimeler: Gıda Fiyatlandırma Stratejileri, Hijyenik Kalite, Köfte, Mikrobiyolojik Kalite.

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INTRODUCTION

Red meat is among the food sources that pose the highest risk in terms of food safety and foodborne diseases. Due to its physicochemical properties, such as slightly acidic pH levels (5.5–6.0), high water activity (0.99 aw), and rich nutritional content, meat provides an ideal environment for the growth and activity of many microorganisms (Altan & İşleyici, 2012; Güldemir et al., 2022). Ground meat, which is used in meatball production, has a very short shelf life and typically needs to be consumed within 1–3 days (Lizcano-Prada et al., 2024; Karasu & Özdemir, 2022). In addition to the issue of short shelf life, factors such as the health status of the animal, processing methods during slaughter, workers, tools, and equipment can lead to the contamination of red meat with pathogenic microorganisms. The consumption of meat products made from fresh ground meat has been increasing in both developed and developing countries due to technological advancements and changing dietary habits. In particular, ready-to-cook meatballs made from fresh ground meat are among the most preferred meat products (Bostan, 2002; Yıldız et al., 2004). Meatballs are defined as mixtures of raw or cooked red or poultry meat prepared from carcass meat of cattle, sheep, goats, or poultry, alone or in combination, along with the addition of one or more food ingredients such as animal fats, flavorings, and other food ingredients, prepared in accordance with the relevant communiqué (Meat Communiqué, 2018/52). Bacteria present on the surface of meat spread throughout the product during the grinding and mixing processes. These types of products, marketed raw, are prone to spoilage during storage and may harbor numerous pathogenic microorganisms from various sources, posing a significant threat to consumer health (Bostan, 2002; Kamumu et al., 2021).

The primary public health risks associated with meatballs are foodborne pathogens such as *Salmonella* spp., *L. monocytogenes*, and *Escherichia coli* O157. According to the EFSA 2021 report, these pathogens are among the most concerning microorganisms regarding food safety in Europe. Their animal origins, presence in many different foods, and the large number of foodborne illnesses they cause each year keep these pathogens a constant concern (Lizcano-Prada et al., 2024; Güldemir et al., 2022). While some consumers are aware of these risks and pay attention to maintaining hygienic conditions during food preparation, understanding consumer behavior is crucial. Understanding consumer behavior helps businesses offer the right products or services, identify factors influencing purchasing decisions, and analyze the purchasing process, thereby enhancing sustainability and consumer satisfaction (Bekar & Gövce, 2015).

Consumers often focus on the quality-price relationship of products and believe that branded products are higher quality. Factors such as social class and income level influence brand preferences (Kızılaslan & Kızılaslan, 2008). Price variations are a critical criterion for determining food prices, particularly at the provincial level and among different income levels. In addition to social class, the residential area also significantly affects price differences. In this context, the aim of our study was to compare the hygienic quality of meatballs sold at economical prices in low- to middle-income regions with those sold at higher prices in high-income regions.

MATERIALS AND METHODS

Sample collection

Meatball samples were obtained from businesses with two different pricing strategies in this study. Business I represents butcher shops and restaurants selling raw meatballs at economical prices. In this group, a total of 30 raw meatball samples, each weighing 50 grams, were collected from different locations in sterile packaging. Business II represents butcher shops and restaurants selling raw meatballs at higher prices. Similarly, a total of 30 raw meatball samples, each weighing 50 grams, were collected from different locations in sterile packaging. All collected samples were transported under a cold chain to the XXX University Department of Food Hygiene and Technology laboratory, where the analyses were performed.

Microbial analysis

From each meatball sample, 10 grams were weighed and placed in stomacher bags, and 90 mL of Maximum Recovery Diluent (MRD, Merck 1.12535) was added. The samples were then homogenized for 2–3 minutes in the stomacher, and 1/10 dilutions were prepared. Subsequently, serial dilutions were made using tubes containing 9 mL of MRD.

Total aerobic mesophilic bacteria (TAMB) counts were performed using the pour plate method on PCA (Plate Count Agar, Merck). The samples were incubated at 37°C for 48 hours, and petri plates containing 30–300 colonies were evaluated (ISO 4833-2:2013).

Yeast and mold counts were determined using the spread plate method on DRBC Agar (Dichloran Rose Bengal Chloramphenicol Agar, Merck). The samples were incubated at 25°C for 5 days, after which colony counting was performed (ISO 21527-2:2008).

Coliform counts were determined using the double-layer pour plate method on VRBA (Violet Red Bile Agar, Merck). The samples were incubated at 30°C for 24 hours, and colony evaluation was performed afterward (ISO 4832:1996).

Staphylococcus/*Micrococcus* counts were determined using the spread plate method on BPA (Baird-Parker Agar, Merck) supplemented with egg yolk–tellurite emulsion (Merck). After 48 hours of incubation at 37°C, black colonies were identified as *Staphylococcus*/*Micrococcus* counts.

Coagulase tests were performed on zoned and atypical colonies to determine the *S. aureus* count (ISO 6888-1:2003).

E. coli counts were determined using the spread plate method on TBX (Tryptone Bile X-Glucuronide, Oxoid) Agar. The samples were incubated initially at 30°C for 4 hours and then at 44°C for 20 hours, after which the colonies were evaluated (ISO 16649-2:2001).

For isolation of *Salmonella*, 25 grams of meatball samples were weighed and placed in stomacher bags, and 225 mL of Buffered Peptone Water (BPW, Merck) was added. The samples were homogenized in the stomacher for 2–3 minutes and incubated at 37°C for 24 hours for pre-enrichment. Following pre-enrichment, 0.1 mL of the sample was transferred into tubes containing 10 mL of Rappaport-Vassiliadis Soya Peptone Broth (RVS, Oxoid) and incubated at 42°C for 24 hours for selective enrichment. After selective enrichment, an inoculation loopful of the liquid medium was streaked onto XLT4 (Xylose Lysine Tergitol-4) Agar plates, which were then incubated at 37°C for 24–48 hours. Black colonies grown on XLT4 Agar were dissolved in 0.5–1 mL of sterile water for biochemical tests and inoculated with a needle loop into Lysine Iron Agar (LIA, LAB 054) and Triple Sugar Iron Agar (TSIA, Oxoid CM 277). These media were incubated at 37°C for 24 hours. Colonies showing yellow-black at the bottom, red at the surface, and gas holes in TSIA medium were considered *Salmonella* spp. suspects (FDA, 2011). The *Salmonella spp.* suspect colonies were subsequently preserved in Tryptic Soy Broth (TSB, Merck) for PCR analysis.

For isolation of *L. monocytogenes*, 25 grams of meatball samples were placed in stomacher bags, and 225 mL of Half-Fraiser Broth (HF, Oxoid) was added. The samples were homogenized in the stomacher for 2–3 minutes and incubated at 30°C for 24 hours for pre-enrichment. Following pre-enrichment, 0.1 mL of the sample was transferred into tubes containing 10 mL of Fraiser Broth (FB, Oxoid) and incubated at 35°C for 24 hours for selective enrichment. After selective enrichment, an inoculation loopful of the liquid medium was streaked onto Oxford Agar (Merck) plates using the streaking method, and the plates were incubated at 35°C for 48 hours (EN-ISO 11290-1:2017). At the end of the incubation period, colonies suspected of being *L. monocytogenes* were preserved in Tryptic Soy Broth (TSB) medium for PCR analysis.

Polymerase chain reaction (PCR)

The primers used for the identification of *L. monocytogenes* and *Salmonella spp.* are shown in Table 1. Gene amplification was performed using a Thermal Cycler (Thermo Scientific, Finland). The total reaction volume was set to 25 µL, consisting of 12.5 µL Master Mix, 0.25 µM of each primer, 1 µL DNA, and 11 µL DNase-free water. PCR conditions were as follows: for *L. monocytogenes*, 94°C for 30 seconds denaturation, 68°C for 60 seconds primer annealing, and 72°C for 90 seconds final extension; for *Salmonella* spp., 95°C for 30 seconds denaturation, 51°C for 30 seconds primer annealing, and 72°C for 30 seconds final extension, each carried out for 35 cycles. PCR products were stained with ethidium bromide (0.5 µg/mL), run on a 1.5% agarose gel, visualized under UV light using a Vilber Lourmat (Quantum ST4 1100/26MX Xpress UV Table, France) imaging system, and the resulting bands were examined.

Table 1. Primers for Salmonella spp. and L. monocytogenes.

Gen	Primer	PCR (bp)	Bacteria	Reference
hlyA	F: 5'-ATCATCGACGGCAACCTCGGAGAC-3' R: 5'-ACCATTCCCAAGCTAAACCAGTGC-3'	404	*L. monocytogenes*	Wu and ark., 2004
iroB	F: 5'-GCAGAAGCTGGGTTGGTGGTATTT-3' R: 5'-AGAAGACGCTTGCGATCAGGTGTA-3'	500	*Salmonella* spp.	Nair and ark., 2015

Statistical analysis

The SPSS 30 statistical software was used to compare the meatball samples. T-test was applied to determine the differences between the samples. The significance level was considered at $p<0.05$ for all analyzes.

Ethical considerations

This study does not require ethics committee approval as it does not involve data collection from human or animal subjects.

RESULTS

The microbiological analysis results of the meatball samples are presented in Table 2 and Table 3. In Business I, the average counts for TAMB, yeast-mold, coliforms, and *Staphylococcus/Micrococcus* were found to be 5.83 log CFU/g, 4.46 log CFU/g, 3.50 log CFU/g, and 3.97 log CFU/g, respectively. In Business II, these values were determined as 5.81 log CFU/g,

4.97 log CFU/g, 3.27 log CFU/g, and 3.51 log CFU/g, respectively.

When Table 2 is examined, a statistically significant difference was found only in yeast-mold counts among the microbiological analysis results ($p<0.05$).

In the analyses conducted on meatball samples, the *S. aureus* count was determined to be an average of 2.12 log CFU/g in Business I and 1.96 log CFU/g in Business II. The *E. coli* counts were found to be 3.26 log CFU/g in Business I and 3.31 log CFU/g in Business II. No statistically significant difference was observed between the business types in terms of *S. aureus* and *E. coli* counts ($p>0.05$).

Table 2. Microbiological analysis of meatball samples I (log CFU/g±SD).

Business	TAMB	Yeast/Mold	Coliform	*Staph/Micrococcus*
Business I	5.83±0.18	4.46±0.16[a]	3.50±0.22	3.97±0.19
Business II	5.81±0.19	4.97±0.19[b]	3.27±0.32	3.51±0.17

TAMB: Total aerobic mesophilic bacteria count

[a]-[b]: Different superscripts in the same column indicate statistically significant differences ($p<0.05$).

The *Salmonella* positive rate was determined to be 3.3% in the samples from Business I and 6.6% in the samples from Business II. However, *L. monocytogenes* was not detected in meatball samples from either business type (Table 3).

Table 3. Microbiological analysis of meatball samples ii.

Business	*S. aureus* (log CFU/g±SD)	*E. coli* (log CFU/g±SD)	Business I and II positive samples (%)	
			Salmonella spp.	*L. monocytogenes*
Business I	2.12±0.19	3.26±0.17	1 (%3.3)	-
Business II	1.96±0.23	3.31±0.26	2 (%6.6)	-

SD: Standard deviation.

DISCUSSION

Microbiological analyses applied to food are critical indicators for assessing the suitability of raw materials, water, personnel, tools, equipment, storage conditions, and building hygiene used in food production (Bayizit et al., 2003). In this study, microbiological analyses of meatball samples collected from 60 businesses operating in two different locations were conducted to evaluate the hygienic conditions of production environments and raw material selection. Based on the analysis, the compliance level of the samples with the Turkish Food Codex (TFC) "Raw Red Meat and Prepared Red Meat Mixtures Communiqué" (Communiqué No: 2006/31) was assessed. Accordingly, TAMB (m: 5×10^5; M: 5×10^6) and *S. aureus* (m: 5×10^2; M: 5×10^3) values were found to be compliant with the communiqué. However, the yeast and mold counts exceeded the limits set by the TFC Communiqué No: 2006/31 (m: 10^3; M: 10^4).

In terms of *Salmonella* spp. positivity rates, 1 meatball sample (3.3%) from Business I and 2 meatball samples (6.6%) from Business II tested positive. These results indicate non-compliance with the criteria of the relevant communiqué in the TFC (Communiqué No: 2006/31). However, no presence of *L. monocytogenes* was detected in the meatball samples from either location (Table 3). The TAMB, *Staphylococcus/Micrococcus*, coliform, and *S. aureus* values obtained in this study were found to be lower than the microbiological analysis results reported by Kök et al. (2007) and Yıldız et al. (2004), while the yeast and mold counts were higher than those reported in these studies. In both studies (Kök et al., 2007; Yıldız et al., 2004), *Salmonella* spp. positivity rates were reported as 18% and 5.4%, respectively, which are higher than the findings of the current study. Additionally, the microbiological analysis results reported by Yilmaz et al. (2002) for meatball samples (TAMB, yeast-mold, staphylococci-micrococci, and coliform) were higher than those of our study (6.02×10^6 CFU/g, 2.4×10^5 CFU/g, 3.3×10^2 CFU/g, 1.1×10^5 CFU/g, respectively), while *E. coli* and *S. aureus* values were lower (1.0×10^2 CFU/g, 85

CFU/g). These differences, along with the dates of the studies, suggest that hygienic quality in meatball production may have improved to some extent over the years.

The primary aim of our study was to determine whether there was a difference in hygienic quality between meatball samples collected from businesses with low- and high-pricing policies. The findings revealed that, except for yeast and mold counts, there was no statistically significant difference in microbiological quality between the meatball samples from businesses following two different pricing strategies. This indicates that there is no direct relationship between product price and hygienic quality.

Under free-market conditions, the selling price of a product is generally determined based on the purchasing tendencies of the individuals (consumers) offering the product (Karasu & Özdemir, 2022). While many factors influence consumers' purchasing decisions (Özsungur & Güven, 2016), one of these factors is the perceived quality of the product. A product with fixed costs sold at different prices is often attributed to quality differences. The quality of a product like meatballs can vary depending on factors such as its microbiological flora and chemical composition (Atlan & İşleyici, 2012).

The most critical factor determining the cost of meatballs is the quality of red meat (Güldemir et al., 2022). The price of red meat, in turn, varies depending on the characteristics of the animal carcass (age, gender, health status), trimmings obtained during carcass processing, or, in worse scenarios, raw materials obtained from illegal or dead-slaughtered animals (Tosun & Demirbaş, 2012). The most fundamental indicator of the hygienic quality of this raw material is microbiological analysis results.

However, price differences among businesses operating in the same location are not solely attributable to raw material quality. One possible reason for this could be customer dependency. In consumer behavior, dependency refers to loyalty to a specific product, brand, or business and resistance to change (Espejel et al., 2011). Additionally, factors beyond price may also influence consumers' purchasing tendencies. For instance, a study (Lizcano-Prada et al., 2024) examining food purchasing preferences in Turkey, Spain, and Colombia found that Turkish consumers prioritize healthy and high-quality food more than price compared to consumers in other countries. The same study highlighted that Turkish consumers' preference for healthy and high-quality food products increases their tendency to choose higher-priced products (Terkan, 2014). This supports the perception that lower-priced products are often associated with being inferior or unhealthy. In the current study, the ability of high-priced meatball businesses to sustain their presence in a limited location may also be linked to this perception.

CONCLUSION

This study compared the microbiological quality of meatball samples collected from businesses applying low- and high-pricing policies. The results demonstrated that total aerobic mesophilic bacteria (TAMB) and *Staphylococcus aureus* values in both pricing groups complied with the Turkish Food Codex. However, it was found that yeast and mold counts in samples from low-priced businesses exceeded the specified limits, while *Salmonella spp.* positivity rates were 3.3% in low-priced businesses and 6.6% in high-priced businesses. *L. monocytogenes* was not detected in samples from either group. The most notable finding of the study is that, apart from yeast and mold counts, there was no statistically significant difference in microbiological quality between the meatball samples from businesses applying different pricing policies. This finding suggests that product price is not a direct determinant of hygienic quality and that consumer perceptions in this regard can be misleading. In conclusion, while microbiological quality alone may not be sufficient to evaluate the overall quality of a product, this study provides valuable insights into the relationship between food pricing and hygienic quality. It underscores the need for a more comprehensive examination of how pricing policies influence perceptions of safety and hygiene, both for consumers and producers.

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Conflict of Interest

The authors declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Author Contributions

Plan, design: TEG, HT; **Material, methods and data collection:** TEG; **Data analysis and comments:** TEG, HT; **Writing and corrections:** TEG, HT.

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The Effect of Therapeutic Touch on the Loneliness and Hopelessness Levels of Patients Undergoing Hemodialysis: A Randomized Controlled Trial

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ABSTRACT

Objective: This study was conducted as a randomized controlled experimental study to examine the effect of therapeutic touch on loneliness and hopelessness levels in hemodialysis patients. **Materials and Methods:** This randomized controlled experimental study was conducted with patients undergoing hemodialysis at the hemodialysis unit of a hospital in Turkiye. The sample consisted of 40 patients (20 control, 20 intervention) who voluntarily participated in the study. Data were collected using the Patient Information Form, UCLA Loneliness Scale, and BECK Hopelessness Scale. Therapeutic Touch was given to the patients in the intervention group for 15 minutes every other day for three days, whereas no interventions other than routine care were applied to patients in the control group. **Results:** After the therapeutic touch, it was found that the mean scores received from UCLA and BECK scales were statistically lower in the intervention group compared to the control group ($p<0.001$). **Conclusion:** Our study found that the Therapeutic Touch intervention decreased the loneliness and hopelessness levels of the patients.

Keywords: Hemodialysis, Nursing, Hopelessness, Loneliness, Therapeutic Touch.

Hemodiyaliz Tedavisi Alan Hastalarda Terapötik Dokunmanın Yalnızlık ve Umutsuzluk Düzeylerine Etkisi

ÖZ

Amaç: Bu çalışma hemodiyaliz hastalarına uygulanan terapötik dokunmanın yalnızlık ve umutsuzluk düzeyine etkisini incelemek amacıyla randomize kontrollü deneysel bir çalışma olarak yapıldı. **Gereç ve Yöntem:** Bu randomize kontrollü deneysel çalışma, Türkiye' deki bir hastanenin hemodiyaliz ünitesinde hemodiyaliz tedavisi gören hastalarla gerçekleştirildi. Örneklemi araştırmaya gönüllü olarak katılan 40 hasta (20 kontrol, 20 müdahale) oluşturmuştur. Veriler Hasta Bilgi Formu, UCLA Yalnızlık Ölçeği ve BECK Umutsuzluk Ölçeği kullanılarak toplandı. Müdahale grubundaki hastalara üç gün boyunca günaşırı 15 dakika Terapötik Dokunma uygulaması yapılırken, kontrol grubundaki hastalara rutin bakım dışında herhangi bir müdahale uygulanmadı. **Bulgular:** Tedavi edici dokunmanın sonrasında müdahale grubunda UCLA ve BECK ölçeklerinden alınan puan ortalamalarının kontrol grubuna göre istatistiksel olarak daha düşük olduğu belirlendi ($p<0,001$). **Sonuç:** Çalışmamız Terapötik Dokunma müdahalesinin hastaların yalnızlık ve umutsuzluk düzeylerini azalttığını bulundu.

Anahtar Kelimeler: Hemodiyaliz, Hemşirelik, Umutsuzluk, Yalnızlık, Terapötik Dokunma.

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INTRODUCTION

Chronic Renal Failure is an irreversible disease in which the glomerular filtration rate (GFR) drops below 60 ml/min for three months or more, followed by renal damage (Webster, 2017). End-Stage Renal Failure (ESRD) is defined as a chronic and progressive decline in renal functions necessary to sustain the body's fluid-electrolyte and metabolic functions, beginning with a drop in GFR. Peritoneal dialysis (PD), hemodialysis (HD), as well as kidney transplantation are all treatment methods for ESRD (Eckert et al., 2018).

Hemodialysis is the most commonly employed method among these treatments. Patients treated by hemodialysis suffer many symptoms, depending on the disease and treatment process, and they have to deal with problems, such as family role change, social isolation, and fear of death (Burrai et al., 2019). These problems may cause the patients to suffer hopelessness, which is described as negative expectations and feelings of deadlock in achieving a goal (Dziubek et al., 2016).

Hemodialysis is a type of therapy that threatens individuals' biopsychosocial integrity, causes them to experience the fear of solitude in the future, and distorts their peace (Thomas et al., 2017). When a patient's loneliness problem is overlooked by medical staff and the patient is unable to obtain the required assistance, the loneliness problem also becomes a secondary complication of the disease (Akbaş et al., 2020). Therefore, it is crucial to pay special attention to hemodialysis patients' feelings of loneliness and to approach them within the scope of holistic care.

The literature includes a limited number of studies examining the effect of integrative practices on loneliness and hopelessness. These practices include art therapy and aerobic exercises (Aydın et al., 2021; Dieli Conwright et al., 2018). Being one of the integrative methods, the Therapeutic Touch (TT) is a personalized therapy based on the notion that the human being is an energy field and a form of flow. TT is a validated intervention that teaches individuals how to discover their internal balance and how to harness the universe's energy with a certain intention and compassion (Bağcı et al., 2019). Although energy is balanced and flows smoothly when one is healthy, there is an energy imbalance or disorder when one is ill. The energy field of a human extends beyond the skin level, and the Therapeutic Touch practitioner adapts himself to this energy by employing his hands as sensors in the receiver's energy field (Olivares et al., 2019).

Body-based methods used in the field of Complementary and Alternative Medicine (CAM) constitute an important area in managing or alleviating the conditions or symptoms of Chronic Kidney Failure that patients experience. The National Center for Complementary and Integrative Health (NCCIH) defines body-based methods as a series of techniques that involve the movement of the body, including the soft tissues, circulatory and lymphatic systems, as a useful way to achieve health and well-being (Chu et al., 2022).

Therapeutic touch, which is known to alleviate feelings of loneliness and hopelessness, is a holistic approach that has effects such as adjusting, expanding, balancing, and preserving energy by affecting energy fields with the hands to treat diseases and symptoms induced by the imbalance in vital energy fields (Reeve et al., 2020). Although the literature includes no studies related to the effect of TT on levels of loneliness and hopelessness, there have been studies on other issues. In their study, Mueller et al., (2018) suggested that it is a non-invasive nursing practice in the management of back pain in adult patients (Mueller et al., 2018). In their study, Doğru et al., (2021) reported that TT decreased the levels of stress, fatigue, and daytime sleepiness, and increased sleep quality (Vural et al., 2021).

Therapeutic touch, which has a healing and soothing effect on diseases, is a newly popular nursing technique intended at helping individuals, the importance and use of which have been increasing among nurses in the recent period (Reeve et al., 2020). Nurses employ TT to express messages such as intimacy, attention, trust, courage, sincerity, kindness, empathy, respect, support, tolerance, acceptance, and eagerness to help. While other healthcare professionals can learn and implement therapeutic touch, TT is suggested to be provided to patients as a nursing practice within the scope of the professional nursing practice. Nurses are the most suitable healthcare professionals for TT intervention since they have direct contact with patients and are continuously observing and assessing them (Alp et al., 2020).

Hypotheses of the study

H_{01}: Therapeutic touch applied to hemodialysis patients for 15 minutes for three days every other day is not effective on the level of loneliness.

H_{11}: Therapeutic touch applied to hemodialysis patients for 15 minutes every other day for three days is effective on the level of loneliness.

H_{02}: Therapeutic touch applied to hemodialysis patients for 15 minutes every other day for three days is not effective on the level of hopelessness.

H_{12}: Therapeutic touch applied to hemodialysis patients for 15 minutes every other day for three days is effective on the level of hopelessness.

This study is believed to contribute to the literature since it is the first attempt to determine the effect of Therapeutic Touch on loneliness and hopelessness levels of patients undergoing hemodialysis.

MATERIALS AND METHODS

Study type

This study was conducted as a randomize controlled study.

Study group

This study was conducted as a randomized controlled experimental study to determine the effect of Therapeutic Touch on the loneliness and hopelessness levels of patients undergoing hemodialysis. The population consisted of 78 patients who were treated in the hemodialysis unit of a hospital between 19 February 2021 and 27 March 2021. The sample consisted of 40 patients who were voluntary to participate in the study and were undergoing hemodialysis for at least three months, had cognitive functions, and had a UCLA score of >20 and a BECK score of ≥4. The patients were randomly divided into intervention (n=20) and control (n=20) groups based on the simple randomization method on the computer by the biostatistician.

The sample size of our study was calculated with G Power V3.1.9.7 according to the power analysis performed by the biostatistician, the partial η2=0.864 indicating the post-study effect size for the Beck Hopelessness Scale, and the statistical power was 99.9%. According to the power analysis for the interaction effect according to the UCLA Loneliness Scale, the partial η2=0.906 indicating the effect size and the statistical power was 99.9%. In line with these results, it was decided that the sample size of 40 patients (20 interventions, 20 controls) was sufficient.

Procedures

The researcher attended a 2-day Therapeutic Touch course to apply Therapeutic Touch and received a certificate. The procedure was explained to the patient before the intervention.

The intervention was implemented according to the sessions of patients undergoing hemodialysis. The session hours were 08.00 to 12.00 and 13.00 to 17.00. The intervention began half an hour after the patient was hooked up to dialysis and ended half an hour before the patient left the dialysis machine.

The patient identification form, the UCLA Loneliness Scale, and the BECK Hopelessness Scale were collected from the patients in the intervention group before starting the intervention.

Firstly, the procedure was explained to the patient before the application. The temperature of the room of the patients was kept within the range of 22-26ºC. The patients were supported by pillows under the head and knees, allowing them to lie comfortably in the supine position.

Before the intervention, the researcher washed his hands and was focused. To evaluate the energy field of the patient, the hands were moved 5-15 cm away, by making a sweeping motion over the body. The application was made from the patient's head area to the foot area. The researcher evaluated the patient's energy field, and if there were distressed and painful areas, more time was allocated to those areas. It was continued until the patient's energy field was balanced, that is, until no tingling or heat increase was felt in the hands of the practitioner. The Therapeutic Touch application lasted an average of 15 minutes, and the procedure was performed every other day for 3 days.

After the intervention, the researcher asked the patients for feedback and answered the patients' questions. At the end of the 3-day application, the UCLA Loneliness Scale and the BECK Hopelessness Scale were refilled.

No intervention was made in the control group, their routine care and treatment continued, and the UCLA Loneliness Scale and BECK Hopelessness Scale were filled again.

Data collection

Patient Information Form: After reviewing the literature (Akbaş et al., 2020; Aydın & Kutlu, 2021; Mueller et al., 2018; Alp & Yucel, 2020), the researcher prepared a patient introduction form that included a total of 16 questions about age, gender, marital status, educational background, income status, number of children, chronic disease, routinely used medicines, diagnosis time, duration of HD, and perception of social support.

UCLA Loneliness Scale: The scale was developed by Russell et al., in 1980 and its Turkish validity and reliability study was conducted by Demir (Russell et al., 1980; Demir, 1989). The UCLA Loneliness Scale includes a total of 20 questions, ten of which are scored reversely. Each item is scored between 1-4 points. When calculating loneliness, they are calculated by getting the reciprocal of the scores given to the reverse items (Karaoğlu et al., 2009). The highest and lowest scores on the scale are 80 and 20. Higher scores signify a high level of loneliness (Çeçen, 2008). In the study conducted by Demir, Cronbach's alpha value of the scale was found to be 0.96 (Russell et al., 1980; Demir, 1989). In our study, the Cronbach alpha coefficient was 0.975.

Beck Hopelessness Scale (BHS): The scale was developed by Beck et al., in 1974 to measure the hopelessness level and its Turkish validity and reliability study was conducted by Seber et al., in 1993 (Seber et al., 1993). The scale consists of 20 items rated between 0 and 1. The scale items are divided into three sub-scales: Future Emotions and Expectations (Items 1, 3, 7, 11, and 18), Loss of Motivation (Items 2, 4, 9, 12, 14, 16, 17, and 20), and Hope (Items 5, 6, 8, 10, 13, 15, and 19). The lowest and highest scores on the scale are 0 and 20 and high scores indicate a high level of hopelessness (Durak, 1994). In the study conducted by Beck et al., the Cronbach's alpha value of the scale was found to be 0.86 (Seber et al., 1993; Durak, 1994). In our study, it was calculated as 0.891.

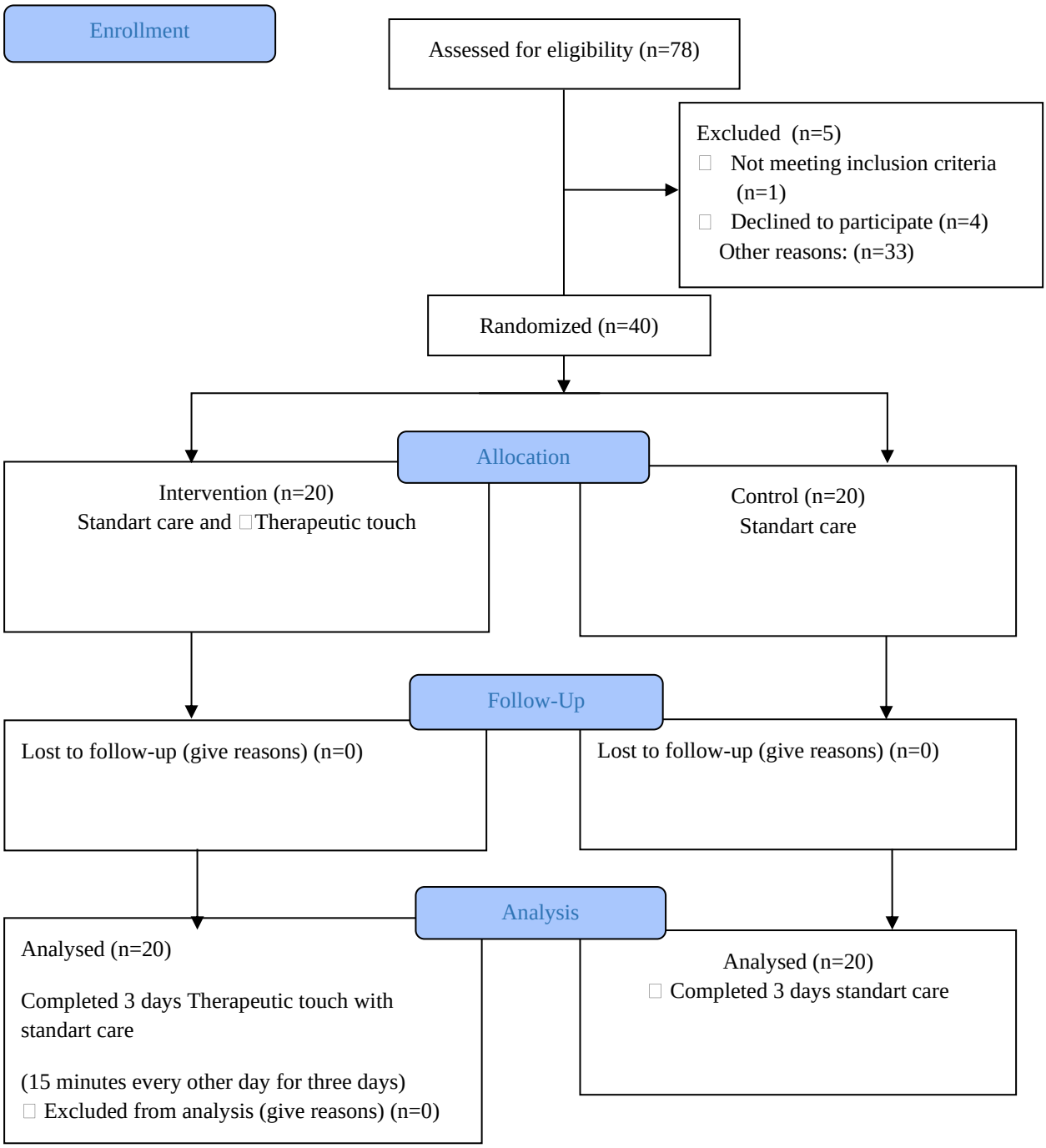

Figure 1. CONSORT flow diagram.

Statistical analysis

The data were assessed by using statistical packaged software of IBM SPSS Statistics Standard Concurrent User V 26 (IBM Corp., Armonk, New York, USA). Descriptive statistics were given as the number of units (*n*), percentage (%), mean±standard deviation ($\bar{x} \pm ss$), median (*M*), the minimum value (*ekd*), the maximum value (*ebd*) 25 percent (O_1), and 75 percent (O_3). The Shapiro Wilk normality test and the *Q-Q* plots were used to assess the normal distribution of the data of the numerical variables. Levine's test was employed to analyze the homogeneity of the variances. In the intergroup comparison of socio-demographic characteristics, the Mann-Whitney *U* test was employed for numerical variables and the exact method of the chi-square test for categorical variables. The Cronbach's alpha coefficient was used to analyze the internal consistency of the scales. Two-way repeated-measures analysis of variance was used from general linear models in the intragroup and intergroup comparison of the scale scores before and after the intervention. In multiple comparisons for main effects, the Bonferroni correction was employed.

Pearson's correlation analysis was conducted to evaluate inter-scale correlations. The value of $p<0.05$ was considered statistically significant.

Ethical considerations

Ethics Committee approval (02.10.2020/17) from the Non-Invasive Clinical Trials Ethics Committee of the University's Faculty of Medicine and written permission (77378720-774.99) from the related institution were obtained for the study. After the participants were informed about the purpose of the study and their oral and written informed consent was acquired. This study is registered with Clinical Trial Registration Number NCT05024201.

RESULTS

Socio-demographic characteristics

The mean age was 56.3±20.2 years in the intervention group and 52.7±17.7 years in the control group, and both groups were similar in terms of other descriptive characteristics ($p>0.05$) (Table 1). Furthermore, the disease-related characteristics of the patients in the intervention and control groups were similar. ($p>0.05$). (See Table 2).

UCLA Loneliness Scale

In the present study, the mean score of the UCLA Loneliness Scale before the intervention was 54.80±8.39 and 54.80±7.99 in the intervention and control groups, respectively, and the UCLA scores of the groups before intervention were similar ($p> 0.05$). Following the intervention, the UCLA mean score of the intervention group decreased (28.55±3.69); whereas, the control group's UCLA mean score increased (57.30±6.30). This difference was considered statistically significant ($p<0.001$) (Table 3).

Beck Hopelessness Scale (BHS)

It was found that the total mean score of the BECK Hopelessness Scale before the intervention was 13.05±2.89 in the intervention group and 13.05±3.05 in the control group. Before the intervention, the BHS mean score in both groups was similar ($p>=0.999$). Following the intervention, the BHS mean score of the intervention group dropped to 4.30±1.30, but the control group's BHS mean score increased to 14.20±2.78, and the difference between the two groups was statistically significant ($p<0.001$) (Table 3).

Table 1. Descriptive characteristics of the patients.

Characteristics	Groups		Test p
	Intervention group (n=20) n (%)	Control group (n=20) n (%)	
Age (year)			
x̄±sd	56.3±20.2	52.7±17.7	z=0.717
M (min-max)	65.5 (22.0-80.0)	53.5 (21.0-80.0)	0.478
Age group			
40 years and below	6 (30.0)	5 (25.0)	χ^2=5.007
41-60	2 (10.0)	8 (40.0)	0.092
61 years and above	12 (60.0)	7 (35.0)	
Gender			
Female	11 (55.0)	10 (50.0)	χ^2=0.100
Male	9 (45.0)	10 (50.0)	0.999
Marital status			
Married	14 (70.0)	15 (75.0)	χ^2=0.125
Single	6 (30.0)	5 (25.0)	0.999
Number of children			
None	4 (20.0)	2 (10.0)	χ^2=1.407
1-3	5 (25.0)	8 (40.0)	0.473
4 and above	11 (55.0)	10 (50.0)	
Educational background status			
Illiterate	6 (30.0)	7 (35.0)	
Primary school	7 (35.0)	7 (35.0)	χ^2=0.220
Secondary school	4 (20.0)	3 (15.0)	0.999
High school/University	3 (15.0)	3 (15.0)	
Income status			
High	4 (20.0)	3 (15.0)	
Middle	7 (35.0)	8 (40.0)	χ^2=0.210
Low	9 (45.0)	9 (45.0)	0.999
Residence place			
Province	15 (75.0)	17 (85.0)	χ^2=0.625
District/Village	5 (25.0)	3 (15.0)	0.695

Table 1 (continued). Descriptive characteristics of the patients.

Characteristics	Groups		Test value p
	Intervention group (n=20) n (%)	Control group (n=20) n (%)	
The people they live with			
Spouse	13 (65.0)	13 (65.0)	
Child	3 (15.0)	5 (25.0)	χ^2=1.500
Parents	1 (5.0)	1 (5.0)	0.764
Other (nephew, sibling)	3 (15.0)	1 (5.0)	
Perception of health			
Good	4 (20.0)	6 (30.0)	
Moderate	6 (30.0)	4 (20.0)	χ^2=0.800
Poor	8 (40.0)	8 (40.0)	0.859
Terrible	2 (10.0)	2 (10.0)	
Perception of social support			
Good	3 (15.0)	2 (10.0)	
Moderate	10 (50.0)	7 (35.0)	χ^2=1.618
Poor	7 (35.0)	11 (55.0)	0.551
Ways to spend leisure time			
Watching TV	11 (55.0)	12 (60.0)	χ^2=3.377
Travelling	2 (10.0)	2 (10.0)	0.761
Walking	0 (0.0)	2 (10.0)	
Cooking	2 (10.0)	2 (10.0)	
Reading	3 (15.0)	1 (5.0)	
Other (gardening, playing with grandchildren)	2 (10.0)	1 (5.0)	

n: Number of units, $\bar{x}$: Arithmetic mean, sd: Standard deviation, M: Median, min: Minimum, max: Maximum, χ^2: Chi-square test statistic, z: Mann-Whitney U test statistic.

Table 2. Disease-related characteristics of the patients.

Characteristics	Groups		Test value p
	Intervention group n (%)	Control group n (%)	
Presence of comorbid chronic disease			
Yes	14 (70.0)	11 (55.0)	χ^2=0.960
No	6 (30.0)	9 (45.0)	0.514
Additional chronic disease			
Heart failure	3 (21.4)	2 (18.2)	
Diabetes	4 (28.6)	0 (0.0)	χ^2=4.312
Hypertension	6 (42.9)	7 (63.6)	0.293
Other (goiter, rhythm disturbance, neurogenic bladder)	1 (7.1)	2 (18.2)	
Drugs used	*n* =17	*n*=15	
Antibiotic	0 (0.0)	1 (6.7)	
Antidiabetic	3 (17.6)	1 (6.7)	
Antihypertensive	9 (53.0)	7 (46.6)	
Anticoagulant	3 (17.6)	4 (26.6)	χ^2=4.285
Diuretic	1 (5.9)	1 (6.7)	0.817
Thyroid	0 (0.0)	1 (6.7)	
Anti-potasium	1 (5.9)	0 (0.0)	
Duration of diagnosis			
5 years and below	10 (50.0)	12 (60.0)	
6-10 years	7 (35.0)	6 (30.0)	χ^2=0.459
10 years and above	3 (15.0)	2 (10.0)	0.824
Duration of hemodialysis			
2 years and below	6 (30.0)	12 (60.0)	
3-5 years	8 (40.0)	2 (10.0)	χ^2=5.600
5 years and above	6 (30.0)	6 (30.0)	0.060

n: Number of units, *M*: Median, O_1: Value of the first quarter, O_3: Value of the third quarter, χ^2: Chi-square test statistics, z: Mann-Whitney U test statistics, * Assessments were made based on the patients with comorbid diseases.

Table 3. Loneliness and hopelessness levels of the patients before and after the practice.

Scales	Groups		Test value
	Intervention group $\bar{X}$±sd	Control group $\bar{X}$±sd	p
Ucla- loneliness scale			
Before the practice	54.80±8.39	54.80±7.99	0.001 0.999
After the practice	**28.55±3.69**	**57.30±6.30**	310.017 <0.001
Test	F=611.249; p<0.001	F=5.544; p=0.024	
Model statistics[&] **Group effect:** f=50.092; p<0.001 **measurement effect:** f=250.182; p<0.001 **group*measurement effect** f=366.611; p<0.001			
Beck -total			
Before the practice	13.05±2.89	13.05±3.05	0.001 0.999
After the practice	**4.30±1.30**	**14.20±2.78**	207.602 <0.001
Test	F=377.106; p<0.001	F=6.514; p=0.015	
Model statistics[&] **Group effect:** f=42.501; p<0.001 **measurement effect:** f=142.248; p<0.001 **group*measurement effect** f=241.373; p<0.001			
Beck - future emotions and expectations			
Before the practice	3.45±1.05	3.75±0.91	0.932 0.340
After the practice	1.35±1.18	4.05±0.88	66.752 <0.001
Test	F=98.576; p<0.001	F=2.012; p=0.164	
Model statistics[&] **Group effect:** f=27.941; p<0.001 **measurement effect:** f=36.212; p<0.001 **group*measurement effect** f=64.376; p<0.001			
Beck - loss of motivation			
Before the practice	5.15±1.13	5.35±1.38	0.249 0.621
After the practice	1.85±1.18	5.40±1.35	78.059 <0.001
Test	F=211.402; p<0.001	F=0.049; p=0.827	
Model statistics[&] **Group effect:** f=25.972; p<0.001 **measurement effect:** f=102.522; p<0.001 **group*measurement effect** f=108.928; p<0.001			
Beck hopelessness scale- hope			
Before the practice	4.45±1.09	3.95±1.46	1.487 0.230
After the practice	1.10±0.78	4.75±1.37	106.468 <0.001
Test	F=152.988; p<0.001	F=8.725; p=0.005	
Model statistics[&] **Group effect:** f=22.558; p<0.001 **measurement effect:** f=44.322; p<0.001 **group*measurement effect** f=117.391; p<0.001			

[&]: Two-Way Repeated Measures Analysis of Variance, **[†]:** Inter-group comparisons in each practice [¥]: Comparisons between practices in each group.

DISCUSSION

Patients undergoing hemodialysis, unlike the other patient groups, is subject to a long and exhausting treatment process. Patients undergo this treatment alone for 4-6 hours for at least three days each week. In the present study, the mean score of the UCLA Loneliness Scale of hemodialysis patients was 54.80±8.39 and their loneliness levels were high. In the study conducted by Koç et al., (2009) to identify the loneliness levels of hemodialysis patients they found that the mean score of the UCLA Loneliness Scale was 37.71±9.76 (Koç et al., 2009). Another study reported that the loneliness mean score of hemodialysis patients was 38.6±12.0 (Ovayolu et al., 2007). When the results were compared, it was found in the present study that hemodialysis patients suffered from loneliness above the average. The present study reported less loneliness in the individuals in the intervention group after the practice of therapeutic touch. Therapeutic Touch is an intervention that promotes interpersonal communication and helps an individual feel supported and not alone. Individuals' feelings of loneliness are alleviated by touch and expressing signals such as "you are not alone," "do not worry," and "I am here."

In the present study, it was found that the BHS mean score of patients undergoing hemodialysis was 13.05±2.89. In their study, Başaran et al., (2016) determined the BHS mean score as 12.76±3.04 (Başaran et al., 2016). In another study, the BHS mean score of hemodialysis patients was found to be 13.70±6.82 (Cengiz et al., 2019). The findings of the present study were shown to be compatible with those published in the literature. The present study indicated that the hopelessness level of the patients decreased after the intervention of therapeutic touch. When studies on Therapeutic Touch in the literature are reviewed, they have demonstrated that Therapeutic

Touch offers several advantages (Başaran et al., 2019). According to a study examining Therapeutic Touch with Chronic Renal Failure patients undergoing hemodialysis, Therapeutic Touch intervention was found to be a professional practice for managing physical and psychological problems. This study found that therapeutic touch activates brain structures such as sensory processing, attention and memory, and manages complex cognition and multi-sensory integration (Karingga, 2021).

TT has also been found to offer subjective advantages, such as elevated mood in the individuals, positive interpersonal relationships, reduced anxiety, and a sense of life satisfaction (Cengiz et al., 2019). In a study conducted by Newshan et al., patients who were subjected to Therapeutic Touch stated, "I can feel all my troubles fly away," "I can honestly say that I feel relaxed and rested during treatment and I would recommend it to everyone," "I am amazed at how quickly it affected," and "I think you should continue to offer Therapeutic Touch intervention to everyone in the hospital." after the intervention (Newshan et al., 2003).

When the satisfaction of the patients in the intervention group with the Therapeutic Touch application was asked in the present study, some patients wished the intervention to continue after the study. The patients emphasized their satisfaction with Therapeutic Touch intervention with expressions like: "I was incredibly pleased with the Therapeutic Touch intervention. Your visit to me for a week raised my hope and alleviated my loneliness. I would really like you to come back again.

"I used to be very obsessed with loneliness. I did not care about most things after the Therapeutic Touch intervention." As these expressions indicate, the Therapeutic Touch intervention was beneficial to the patients' feelings of loneliness and hopelessness.

Furthermore, the nurses at the hemodialysis clinic where the intervention was carried out were pleased with the Therapeutic Touch on the patients. A nurse working in the hemodialysis unit expressed her support for Therapeutic Touch intervention by saying, "We wish that a therapist would implement this intervention on patients regularly on specific days of the week, and we also notice that patients feel relieved and satisfied."

Nurses adopt Therapeutic Touch to give a message to patients that they are there for them. As a result, patients have the opportunity to recover both emotionally and physically.

Limitations of study

The study was conducted with patients undergoing hemodialysis in a state hospital and does not include all hemodialysis patients. Therefore, the result of the study can be generalized to this sample group.

CONCLUSION

In our study, we examined the effect of Therapeutic Touch on the loneliness and hopelessness level of hemodialysis patients. Therapeutic Touch intervention reduced the loneliness and hopelessness levels of the patients and they were satisfied with the outcomes.

In line with these results, it has been suggested to apply Therapeutic Touch to patients with high levels of loneliness and hopelessness, to provide nurses with training on Therapeutic Touch application within the scope of in-service training, and to conduct single-blind or double-blind randomized controlled studies in which Therapeutic Touch is compared with other integrative methods.

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Conflict of Interest

The authors have no conflict of interest to declare.

Author contribution

Plan, design: ZB, SK; **Material, methods and data collection:** ZB; **Data analysis and comments:** ZB; **Writing and corrections:** ZB, SK.

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Ethical approval

Institution: Non-Invasive Clinical Trials Ethics Committee of the Cukurova University's Faculty of Medicine Scientific Research Evaluation Board
Date: 02.10.2020
Approval no: 77378720-774.99

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Investigation of Nursing Students' Beliefs in Sexual Myths Before and After Taking a Sexual Health Course: A Single-Group Quasi-Experimental Study

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ABSTRACT

Objectives: This study aimed to investigate nursing students' beliefs in sexual myths before and after taking a sexual health course. **Materials and Methods:** This study was a single-group quasi-experimental study in nursing department in the west of Türkiye. The population of the research consists of university students enrolled in the sexual health course between February 2022-June 2022. The research was completed with 117 voluntary students. The data were collected with a questionnaire on the descriptive characteristics of the students and the Sexual Myths Scale. In the first week of the sexual health course, students' sexual myths were evaluated with a questionnaire and the Sexual Myths Scale. The sexual myths of the students were reassessed in June 2022, after the students had taken a sexual health course. **Results:** The total mean score of the students' Sexual Myths Scale was 55.9±14.7 and 51.0±15.6 before and after taking the sexual health course. Before the course total mean score of the scale was found high in the students who were over 21 years old, male, whose mother and father were illiterate or literate. **Conclusions:** In the study, it was determined that the sexual health course reduced nursing students' beliefs in sexual myths.

Keywords: Sexual Health, Sexual Myths, Sexual Health Course, University Students.

Hemşirelik Öğrencilerinin Cinsel Sağlık Dersi Almadan Önce ve Aldıktan Sonra Cinsel Mitlere İlişkin İnançlarının İncelenmesi: Tek Gruplu Yarı Deneysel Bir Çalışma

ÖZ

Amaç: Bu çalışmada hemşirelik öğrencilerinin cinsel sağlık dersi almadan önce ve aldıktan sonra cinsel mitlere yönelik inançları incelenmiştir. **Gereç ve Yöntem:** Bu çalışma Türkiye'nin batısında bir hemşirelik bölümünde yürütülmüş, tek gruplu yarı deneysel tipte bir araştırmadır. Araştırmanın evrenini Şubat 2022-Haziran 2022 tarihleri arasında cinsel sağlık dersine kayıtlı üniversite öğrencileri oluşturmaktadır. Araştırma 117 gönüllü öğrenci ile tamamlanmıştır. Veriler, öğrencilerin tanımlayıcı özelliklerine ilişkin anket formu ve Cinsel Mitler Ölçeği ile toplanmıştır. Cinsel sağlık dersinin ilk haftasında öğrencilerin cinsel mitleri bir anket ve Cinsel Mitler Ölçeği ile değerlendirilmiştir. Öğrencilerin cinsel mitleri, öğrenciler cinsel sağlık dersini aldıktan sonra Haziran 2022'de tekrar değerlendirilmiştir. **Bulgular:** Öğrencilerin Cinsel Mitler Ölçeği toplam puan ortalaması cinsel sağlık dersi almadan önce 55.9±14.7 ve aldıktan sonra 51.0±15.6'dır. Ders öncesinde 21 yaş üstü, erkek, anne ve babası okuryazar olmayan veya okuryazar olan öğrencilerin ölçek toplam puan ortalaması yüksek bulunmuştur. **Sonuç**: Araştırmada, cinsel sağlık dersinin hemşirelik öğrencilerinin cinsel mitler inancını azalttığı belirlenmiştir.

Anahtar Kelimeler: Cinsel Sağlık, Cinsel Mitler, Cinsel Sağlık Dersi, Üniversite Öğrencileri.

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INTRODUCTION

As it is known, sexuality is a concept that is shaped by society's point of view and is influenced by moral values, family structure, beliefs, and traditions (Aygin et al., 2017; Aker et al., 2020; Dağlı & Reyhan, 2022; Doğan et al., 2022). Sexual health was defined as "a state of physical, mental and social well-being in terms of sexuality" by the World Health Organization (WHO). In addition, WHO states that it is important to have a safe sex life, a positive and respectful approach to sexuality and emphasizes that coercion, discrimination and violence should not take place in sexual life. For this reason, in order to live and maintain sexual health in a healthy way, the sexual rights of all people should be respected and protected and their beliefs about sexual myths should be corrected with correct information (Leung et al., 2019; World Health Organization, 2021). Adolescence is a period in which accurate sexual information should be obtained and correcting sexual myths during this period is important for a healthy sexual life in the future (Evcili & Golbasi, 2019; Ünlü Suvari & Kaydırak, 2024).

Sexual development is a lifelong process that begins in the womb, and is affected by knowledge, values, attitudes, and beliefs. Adolescence, which is experienced between childhood and adulthood, is a period in which young people reach physical, psychological, and social maturity, gain information about sexual life, make conscious choices and create their unique behaviors, and values (Yanikkerem & Üstgörül, 2019; Leung et al., 2019; Doğan et al., 2022; Ünlü Suvari & Kaydırak 2024).

Sexual myths, which are more common in closed societies, are defined as false and stereotyped judgments that individuals think are true about sexual matters, which do not have a scientific reality (Aygin et al., 2017; Evcili & Golbasi, 2017; Öz et al., 2020; Doğan et al., 2022). Lack of sexual education and information (Davul & Yazıcı, 2019; Öz et al., 2020; Aşcı & Gökdemir, 2021; Doğan et al., 2022; Ünlü Suvari & Kaydırak 2024), not being able to openly talk and discuss sexuality (in the family, school and society) (Karabulutlu, 2018; Öz et al., 2020; Dağlı & Reyhan, 2022; Doğan et al., 2022), and not benefiting from sufficient scientific research and publications on this subject are the most important factors in the formation of sexual myths (Davul & Yazıcı, 2019; Öz et al., 2020). Sexual myths that develop as a result of false beliefs and value judgments about sexuality can lead to sexual dysfunction in an individual's life (Aygin et al., 2017; Davul & Yazıcı, 2019; Ekrem et al., 2022). Sexual pathologies and sexual dysfunctions can be caused by sexual myths. Sexual myths can negatively affect the development of sexual identity and sexual intercourse and reduce the quality of sexual life (Evcili & Golbasi, 2017; Doğan et al., 2022). In addition, treatment processes of sexual dysfunctions caused by sexual myths can also be adversely affected (Evcili & Golbasi, 2017; Dağlı & Reyhan, 2022; Ekrem et al., 2022). Sexual myths can cause the individual to perceive herself/himself as inadequate and give rise to anxiety and fear. For this reason, it is very important to eliminate sexual myths and to transfer information that has been proven to be correct and valid with scientific foundations (Davul & Yazıcı, 2019; Doğan et al., 2022). When the current literature on the subject was examined, most of the studies on young people were related to the prevalence of rape, sexual beliefs, and perspectives of young people, and two international studies examining the sexual myths of young people were found (Bergenfeld et al., 2022; Navarro & Ratajczak, 2022; Steele et al. 2024; Johansson et al. 2024). These studies were carried out in Northern Cyprus (Sarpkaya Güder & Tekbaş, 2022), Germany and Poland (Martyniuk et al., 2015) and the sexual myths of young people were evaluated with the Sexual Myths Scale. In these studies, it was determined that the sexual myths of Polish women and men were higher than those of Germans (Martyniuk et al., 2015), and that students who took sexual health courses in Northern Cyprus had fewer sexual myths than those who did not (Sarpkaya Güder & Tekbaş, 2022). When current studies on sexual myths among university students in Türkiye were examined, in a study in Kafkas University nursing department it was determined that 91.7% of students had sexual taboos. These taboos were lack of sexual equality in society (46.1%), virginity (41.5%), masturbation (6.2%) and religious pressures (6.2%) (Karabulutlu, 2018). In Türkiye studies determined that men have more sexual myths than female students (Karabulutlu 2018; Aker et al., 2019; Kartal, 2020; Öz et al., 2020; Öz et al., 2021; Aşçı & Gökdemir, 2021; Örüklü et al., 2021; Ekrem et al., 2022; Doğan et al., 2022). Publications stated that sexual myths were lower in female nursing and midwifery students who were in their first year of university (Apay et al., 2013). However, there was a study that determined sexual myths were higher in female students aged 19 and younger (Aygin et al., 2017). A study examined the effect of education and found that sexual myths decreased in students who took a sexual health course (Özsoy and Bulut, 2017).

Although it is important that all young people in developing countries who need sexual health information have access to this information, unfortunately, limited sexual education is given to school-age students in our country, sexual health is not included as a separate course in the curriculum, and therefore, students' information resources on this subject are limited (Sexual Education, Treatment and Research Association, 2007; Aker et al., 2019). Sexual health course in Türkiye is usually given as an optional or compulsory course to students studying in

the field of health in university education. In a study conducted with university students in Manisa in the west of our country, it was determined that 57.9% of the students received information about sexuality, 42.7% of the students received this information from their friends and 53.7% from the press/internet. For this reason, it is also important that the nursing students who will serve society have the right, sufficient knowledge, attitude, and behavior about sexual health (Yanikkerem & Üstgörül, 2019).

MATERIALS AND METHODS

Study type

This study was a longitudinal study with a single-group pretest-posttest quasi-experimental type to determine the effect of the sexual health course on nursing students' sexual myths.

Implementation of the study

The population of the research consisted of students enrolled in the sexual health course (N=220) in the 2nd year of Manisa Celal Bayar University, Faculty of Health Sciences, Department of Nursing. Data collection time from the students in both phases was approximately 30 minutes.

Sample of study

In the study, the minimum sample was found 94 students with an 80% confidence interval and 5% deviation by using the Epi Info program. No sample selection was made in the study as it was aimed to reach all the students. The research was completed with 117 students who wanted to participate in the study.

Inclusion criteria from the study

All students who took a sexual health course at the faculty in the spring semester of the 2021-2022 academic year and volunteered to participate in the research were included in the study.

Exclusion criteria from the study

Students who did not answer all of the scale questions, and did not participate in the first stage but participated in the second stage were excluded from the study.

Dependent and independent variables

The independent variables of this research are the descriptive characteristics of the students such as age, gender, family type, perceived income level, education status of mother and father etc. The dependent variable is the SMS total scores.

Data collection tools

The data collection tools in the study consisted of two parts. In the first part, there was a questionnaire containing the introductory characteristics of the students. In this form, there were 11 questions about the age of the students, family type, education and income status of their parents, place of residence for the longest time, prior information about sexual health, and information sources. The second part included the Sexual Myths Scale (SMS) which was developed by Gölbaşı et al. (Golbası, Evcili, Eroglu and Bircan 2016). The scale is a five-point Likert-type scale and consisting of 28 questions. The lowest and highest scores to be obtained from the scale were 28 and 140, respectively (Golbası et al., 2016; Evcili and Golbasi, 2017). High scores on this scale indicate a high belief in sexual myths. The Cronbach's alpha coefficient of this scale was found to be 0.910 (Golbası et al., 2016). In this study, the Cronbach's alpha value of the scale was determined as 0.909 and 0.928 before and after the sexual health course, respectively.

Data collection process

Data were collected between February 2022 and June 2022 via an online survey link prepared via Microsoft Forms. Before sharing the study link, permission was obtained from the lecturers giving the compulsory sexual health course. Verbal and written informed consent were obtained from all students. This research was completed in two phases. In the first phase of the research, data were collected from the students in the first week of the sexual health course (February 2022) with a questionnaire on descriptive characteristics and the SMS. The sexual health course was given face-to-face as a one-hour course for 13 weeks in two separate classes with the same curriculum. The content of the sexual health course covers the following topics: female and male anatomy and sexual functions, reproduction and sexual rights, sexual myths, sexual harassment, rape and violence, sexual health cycle, family planning methods, safe sex, sexually transmitted diseases, sexual problems, sexual dysfunctions, sexual orientation, paraphilias, sexuality according to life cycles (adolescence, pregnancy, postpartum and senilium), the effects of disease, medication, and disability on sexual life).

After the end of the sexual health course, the second link of the questionnaire which included the SMS was shared with the students again in June 2022. The students were asked to write the same codes they determined for themselves in the pretest and posttest forms and the researcher matched them.

Statistical analyses

Data analyses were made in the SPSS 20.0 software. The descriptive characteristics of the students were evaluated with number, percentage and mean. Normality distribution among the scale scores was examined by the Kolmogorov Smirnov test and it was determined that the scores were homogeneously distributed. The relationship between the SMS total scores of the students before and after taking the sexual health course was evaluated with the paired t-test. The relationship between the pre-and post-course mean of the SMS total score and the descriptive characteristic of the students was evaluated with the One-Way ANOVA and the Independent Samples t-test.

Ethical considerations

Ethical approval was obtained from the Ethical Committee of the Manisa Celal Bayar University (Date: 21.10.2021, Approval No: 20.478.486.977). The study protocol and consent procedure were approved by the dean of the faculty of health sciences. Written informed consent was obtained from the students who agreed to participate in the study. Permission for the use of SMS in the research was obtained from Gölbaşı.

RESULTS

The descriptive characteristics and sexual knowledge of the students were presented in Table 1.

Table 1. Characteristics of the nursing students.

Characteristics of the nursing students	n (%)
Age group	
≤20	85 (72.6)
≥21	32 (27.4)
Gender	
Female	89 (76.1)
Male	28 (23.9)
Family type	
Nucleus	92 (78.6)
Extended	17 (14.6)
Broken	8 (6.8)
Perceived income level	
High	10 (8.5)
Middle	77 (65.8)
Low	30 (25.7)
Education status of mothers	
Illiterate or literate	11 (9.4)
Primary and secondary school	74 (63.2)
High school and above	32 (27.4)
Education status of fathers	
Illiterate or literate	4 (3.5)
Primary and secondary school	65 (55.5)
High school and above	48 (41.0)
Longest place of residence	
Village	20 (17.1)
City	55 (47.0)
Town	42 (35.9)
Having any information about sexuality	
Yes	117(100.0)
No	0 (0.0)
The source of the first information about sexuality	
High school	42 (35.9)
Family	17 (14.5)
Friends	18 (15.4)
Media (TV, magazine, internet)	40 (34.2)
Age at first sexual information	
6-12 age	44 (37.6)
≤13 age	73 (62.4)
Having sexual experience	
Yes	21 (17.9)
No	96 (82.1)
Total	117 100.0)

Table 2. The relationship between the students' characteristics and the total mean score of the Sexual Myths Scale before the sexual health course.

Characteristics of the nursing students	Before the sexual health course	
	Mean±SD	Test and p value*
Age group		
≤20	53.8±13.9	t=-2.632
≥21	61.6±15.3	**p=0.010**
Gender		
Female	51.9±12.4	t=-6.073
Male	68.8±14.1	**p=0.000**
Family type		
Nucleus	56.4±14.6	
Extended	56.9±15.2	F=1.234
Broken	48.1±13.7	p=0.295
Perceived income level		
High	58.4±8.1	
Middle	55.3±14.5	F=0.284
Low	56.9±17.0	p=0.753
Education status of mothers		
Illiterate or literate	72.8±16.5	
Primary and secondary school	55.7±12.7	F=10.838 **p=0.000**
High school and above	50.8±14.5	
Education status of fathers		
Illiterate or literate	72.3±10.1	
Primary and secondary school	56.8±15.3	F=3.452 **p=0.035**
High school and above	53.4±13.2	
Longest place of residence		
Village	58.0±15.2	
City	55.0±14.9	F=0.303 p=0.739
Town	56.2±14.3	
The source of the first information about sexuality		
High school	55.0±14.2	
Family	53.0±16.1	
Friends	58.9±14.6	
Media (TV, magazine, internet)	56.9±14.8	F=0.581 p=0.629
Age at first sexual information		
6-12 age	54.1±14.1	t=-1.038
≤13 age	57.0±15.0	p=0.302
Having sexual experience		
Yes	56.0±15.8	t=0.001
No	55.9±14.5	p=0.999

F=OneWay ANOVA test, t= Independent Samples t-test

Of the students, 72.6% were 20 years old and under, 76.1% were women, 78.6% had a nuclear family type, 47.0% had lived in the city for a long time and 65.8% had middle income. Overall, 63.2% of the mothers and 55.5% of the fathers of the students were primary

and secondary school graduates, respectively. The students stated that they received their first information about sexuality from high school (35.9%) and the media (34.2%). Of the participants, 62.4% stated that the age to get the first sexual information was 13 years old and over and 82.1% had no sexual experience (Table 1).

Table 3. The relationship between the students' characteristics and the total mean score of the Sexual Myths Scale after the sexual health course

Characteristics of the nursing students	After the sexual health course	
	Mean±SD	Test and p value*
Age group		
≤20	48.4±14.7	t=-3.062
≥21	58.0±16.0	**p=0.003**
Gender		
Female	46.3±12.2	t=-5.959
Male	65.9±16.0	**p=0.000**
Family type		
Nucleus	51.5±16.1	
Extended	50.7±14.6	F=0.418
Broken	46.3±12.3	p=0.660
Perceived income level		
High	47.4±13.2	
Middle	52.1±15.3	F=0.601
Low	49.5±17.2	p=0.550
Education status of mothers		
Illiterate or literate	68.8±17.0	
Primary and secondary school	50.0±14.6	F=9.475
High school and above	47.3±13.5	**p=0.000**
Education status of fathers		
Illiterate or literate	71.5±11.1	
Primary and secondary school	51.4±16.4	F=4.210
High school and above	48.8±13.5	p=0.143
Longest place of residence		
Village	52.0±17.6	
City	50.5±15.3	F=0.079
Town	51.3±15.4	p=0.924
The source of the first information about sexuality		
High school	49.5±14.2	
Family	49.1±15.6	
Friends	56.3±16.4	
Media (TV, magazine, internet)	51.0±16.6	F=0.909 p=0.439
Age at first sexual information		
6-12 age	48.6±15.3	t=-1.329
≤13 age	52.5±15.7	p=0.187
Having sexual experience		
Yes	50.3±14.8	t=-0.224
No	51.2±15.8	p=0.823

Before taking the sexual health course, a statistically significant relationship was determined between the students' age, gender, education level of parents and sexual myths. The SMS total mean score was found to be high in the students who were over 21 years of age, male, whose mother and father were illiterate or literate (Table 2).

The relationship between the introductory characteristics of the students and their SMS mean total score after taking a sexual health course was given in Table 3. The SMS total score was high in students who were up than 21 age (58.0±16.0), who were men (65.9±16.0), and whose mother's education status was illiterate or literate (68.8±17.0) (Table 3). There was a significant relationship between the SMS total score before (55.9±14.7) and after the sexual health course (51.0±15.6) (p=0.000) (Table 4).

Table 4. The relationship between students' Sexual Myths Scale mean scores before and after the sexual health course.

Taking sexual health course	Sexual Myths Scale Mean Score	Test and p value*
	Mean±SD	
Before	55.9±14.7	t=6.117
After	51.0±15.6	**p=0.000**

*t= Paired sample t-test

DISCUSSION

In this study, the effect of sexual health course on the sexual myths of nursing students was examined. As it is known, sexual health is an important part of a healthy life, impairment of sexual health does not only lead to deterioration of physical health; but also, negatively affects psychosocial and mental health. Considering that nurses have a very important role in providing health education in society, the sexual myths of nursing students, who are the nurses of the future, can negatively affect the awareness of individuals about sexual health, their perspective on sexuality, and the care provided. Considering that the lowest 28 and the highest 140 points were obtained from the SMS scale, mean of the total score of the students before taking the sexual health course was found to be 55.9 and it was seen that the sexual myths of the nursing students were close to the middle level. Parallel to our study, in a study conducted with nursing students in the Mediterranean region of southern Türkiye, the mean SMS score of the students was found to be 56.8±17.8 (Öz et al., 2020). The reason why the findings of this study and ours are similar may be due to the fact that our study was conducted in the south of Turkey other in the western part of Turkey, and the students were affected by Western culture with the effect of tourism and their sexual myth beliefs decreased. Higher than this study

data, the mean SMS scores in studies conducted in Türkiye examining the sexual myths of nursing students before taking a sexual health course were between 66.2±17.4 and 76.4±17.1 (Evcili & Demirel, 2018; Kartal, 2020; Aşcı & Gökdemir, 2021; Öz et al., 2021). In a study conducted with students studying in the field of health sciences in Istanbul, the mean SMS score of the students was found to be 61.0±19.1 (Örüklü et al., 2021). In a study conducted with university students studying in a department other than the health department in Türkiye, the scale mean score was found to be 82.2±17.4 (Evcili & Golbasi, 2017). This result may be due to the fact that the studies were carried out in different regions and the health department students gained more awareness each year.

In the current study, the mean score SMS of the nursing students' (51.0±15.6) showed a statistically significant decrease after taking the sexual health course. Similar to our study, after taking the sexual health course, previous studies determined students' SMS scores were lower (Özsoy & Bulut, 2017; Evcili & Golbasi, 2019; Kartal, 2020; Sarpkaya Güder & Tekbaş, 2022). As seen in the study findings, students get accurate information with sexual health education, and the myths believed are reduced. In addition, university education and life can reduce students' belief in sexual myths as they provide access to correct information, peer interaction, and individual development.

In the present study, before taking the sexual health course, it was determined that the mean SMS score of male students (68.8±14.1) was higher than that of female students (51.9±12.4) and they believed in sexual myths more. In parallel with the findings of this study, the mean SMS score of male students in İstanbul was found to be 67.8±21.5 (Örüklü et al., 2021). In other studies in our country, mean SMS scores for male students were 80.3±1.4 in Samsun (Aker et al., 2019), 77.0±15.5 in Tokat (Kartal, 2020), 72.1±20.4 in Bartın (Ekrem et al., 2022) and 86.4±18.3 (Evcili & Golbasi, 2017) in the Central Anatolian region of Turkey, these scores were higher than the findings of this study. In a study conducted in Cyprus, the mean SMS score of male students was found to be lower (63.7±19.4) than the findings of this study, and similar to the results of our study, it was determined that the mean SMS score of male students was higher than female students (Sarpkaya Güder & Tekbaş, 2022). It was clear that studies indicated that male students had a higher mean score than female students. Because men are more active and dominant in patriarchal societies, young men may see sexuality as evidence of masculinity. This may cause men who do not receive adequate sexual education to develop myths and negative beliefs about sexuality. Also, this study and the literature pointed out that SMS scores were significantly higher in males and the reason could be that men were misinformed about sexual issues (Aker et al., 2019; Kartal, 2020; Örüklü et al., 2021; Ekrem et al., 2022).

In this study, after the sexual health lesson, the mean SMS scores of female and male students decreased and were found to be 46.3±12.2 and 65.9±16.0, respectively. In a study in Türkiye, it was found that belief in sexual myths decreased significantly after the course in both male and female students who had attended a sexual health education (Özsoy & Bulut, 2017; Kartal, 2020). It can be said that sexual health education has been effective for both genders.

In the study, before taking the sexual health course, the mean total SMS score of students was determined to be high in the students whose mothers and fathers were illiterate or literate. In a study conducted in Tokat, it was determined that the students whose mothers were illiterate and primary school graduates and those whose fathers were illiterate had a high mean total SMS score (Kartal, 2020). In a study in Samsun, Türkiye, it was determined that as the education level of the mother and father decreased, sexual myth perceptions increased (Aker et al., 2019). In a study in Aydın, Türkiye, students with well-educated mothers had lower average sexual myth scores than those with low-educated mothers (Evcili & Golbasi, 2017). Sexual health education course may be more effective for students whose parents have low educational level. Also, the high educational level of the parents may have decreased the belief in sexual myths of the students who grew up in that family.

In the present research, the sources of information about the sexuality of university students were from high school (35.9%), media (34.2%), friends (15.4%), and family (14.5%). As seen in this study, the rate of obtaining information about sexuality from the family of university students was the lowest. Sex education should be given in the family, starting from childhood and should continue in education life. However, in developing countries, families often avoid talking about sexuality and informing their children about it. This situation causes children and young people to get information about sexuality from sources other than the family, and this information source is usually the Internet (Örüklü et al., 2021; Ekrem et al., 2022). However, it was stated in the research that students who received information about sexuality from the internet had more sexual myths (Agbemenu et al., 2018; Ekrem et al., 2022).

Limitations and Strengths

The research was conducted with nursing students only in a state university, west of Türkiye; the findings cannot be generalized to all university students in the country.

CONCLUSION

In this study, it was concluded that before taking a sexual health course, nursing students believed more in sexual myths. Before the course, SMS mean score was higher in the students who were over 21 years old, male, whose mother and father were illiterate or literate. After the course, the SMS mean score was found higher in students who were up than 21 age, who were men, and whose mother's education status was illiterate or literate. As a result, sexual health education was found to be effective in reducing sexual myths.

It is important for nursing students to change the myths they believe due to their health and counselling roles after graduation. For this purpose, it is recommended that courses or special units be opened in universities to provide sexual health education and counselling to all students and that all nursing students take sexual health courses before graduation.

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Conflict of Interest

The authors declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Author Contributions

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Association Between Psychosocial Factors and Low Back Pain Among Nurses Working in Intensive Care Units

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ABSTRACT

Objective: Low back pain is among the most common occupational health problems in nurses. It is known that occupational exposure and psychosocial factors are important risk factors. The purpose of this study is to assess the prevalence of low back pain among nurses employed in intensive care units and to examine the relationship between psychosocial factors and the occurrence of low back pain. **Materials and Methods:** This cross-sectional study was conducted with 127 nurses employed in intensive care units. Data were gathered on participants' socio-demographic characteristics, presence of low back pain symptoms, and psychosocial factors, and were analyzed using SPSS 15.0. **Results:** The one-month prevalence of low back pain among these nurses was found to be 70.9%. Low back pain was high in female participants [OR:6.56 (95% CI:1.98-21.73)] and those who worked the night shift [OR:6.62 (95% CI:1.68-26.09)] and the presence of the social support in the workplace [OR:0.97 (95% CI:0.95-0.99)] has a protective effect against low back pain. **Conclusion:** Among nurses working in intensive care units, females and those assigned to night shifts experienced more intense low back pain, while those with social support reported less frequent discomfort.

Keywords: Low Back Pain, Psychosocial Factors, Social Support, Effort-Reward Imbalance, Job Strain.

Yoğun Bakım Ünitelerinde Çalışan Hemşirelerde Psikososyal Faktörler ve Bel Ağrısı Arasındaki İlişki

ÖZ

Amaç: Bel ağrısı, hemşirelerde en sık görülen mesleki sağlık sorunları arasındadır. Mesleki maruziyetin ve psikososyal faktörlerin önemli risk faktörleri olduğu bilinmektedir. Bu çalışmanın amacı, yoğun bakım ünitelerinde çalışan hemşirelerde bel ağrısının sıklığını ve psikososyal faktörler ile bel ağrısı arasındaki ilişkiyi belirlemektir. **Gereç ve Yöntem:** Bu araştırma, yoğun bakım ünitelerinde çalışan 127 hemşire ile yürütülen kesitsel bir çalışmadır. Katılımcıların sosyo-demografik özellikleri, bel ağrısı semptomlarının varlığı ve psikososyal faktörler hakkındaki veriler toplanmış ve SPSS 15.0 ile analiz edilmiştir. **Bulgular:** Son bir ay içinde hemşirelerde bel ağrısı sıklığı %70,9 idi. Kadın katılımcıların bel ağrısı erkeklere [OR:6.56 (%95 GA:1.98-21.73)] ve gece vardiyasında çalışanlara [OR:6.62 (%95 GA:1.68-26.09)] göre yüksek bulunmuştur. Buna karşın iş yerinde sosyal desteğin varlığı [OR:0.97 (%95 GA:0.95-0.99)] bel ağrısına karşı koruyucu bir etkiye sahiptir. **Sonuç:** Yoğun bakım ünitelerinde çalışan kadın hemşireler ve gece vardiyasında çalışanlar daha fazla bel ağrısı yaşarken, sosyal desteği yüksek olanlarda bel ağrısı sıklığı daha düşüktür.

Anahtar Kelimeler: Bel Ağrısı, Psikososyal Faktörler, Sosyal Destek, Çaba-Ödül Dengesizliği, İş Stresi.

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INTRODUCTION

Low back pain (LBP) stands out as the most frequently reported musculoskeletal issue among workers. In research on disease burden, Murrey et al., LBP which ranked 11th in the global disability-adjusted life-years in 1990 took the 6th place in 2010. In developed countries, the problem is in the first three (Murray et al., 2012). In the article by Ferrari et al. (2024) on global burden of disease study, it was reported that low back pain dropped from 12th place to 9th place from 1990 to 2021. When the data from the same study is examined, it is seen that it always ranks first in terms of Years Lived with Disability without any change.

LBP complaints are among the most common problems in health and social services workers (Cherry et al., 2001). Studies have reported a wide range of LBP prevalence among nurses, with figures varying between 33.0% and 86.0% (Lorusso et al., 2007). Cargnin and colleagues study involving nurses, LBP was reported by 51.4% of participants over the past year, while 45.4% experienced it within the last week (Cargnin et al., 2019). A review study conducted on Italian nurses reported LBP incidence ranging from 13.7% to 20.0% annually, with prevalence between 17% and 63.7% (Brusini, 2021). An in-depth meta-analysis of research focused on ICU nurses reported that the annual prevalence of low back pain (LBP) ranged from 34.5% to 100.0%. The pooled analysis in this study indicated a 12-month prevalence of 76.0% (95% CI, 69.0%-81.8%) (Sang et al., 2021). Another meta-analysis reported that 65.0% of healthcare workers experienced LBP annually (Al Amer, 2020). A similar rate was found in a meta-analysis study conducted in nurses working in the African region [Prevalence Rate: 64.1% (95% CI: 58.7-69.5)] (Kasa et al., 2020).

In the development of the LBP in working people, not only demographic characteristics (gender, age, etc.) but also occupational factors are effective (Al Amer, 2020; Coury et al., 2002; Latina et al., 2020; Özcan et al., 2007; Strazdins & Bammer, 2004; Vinstrup et al., 2020). A review study identified several significant factors associated with the development of LBP in nurses, including night shifts, inadequate training, frequent patient handling, lack of proper equipment, work department, obesity, age, work-related stress, and a lack of physical activity (Brusini, 2021). LBP complaints are more common especially in female health professionals than in males (Al Amer, 2020; Sun et al., 2021) and the frequency of complaints increase with age (Abolfotouh et al., 2015; Al Amer, 2020; Latina et al., 2020; Rezaee & Ghasemi, 2014). Another factor affecting LBP was high BMI level (Al Amer, 2020).

Research indicates that physical factors play a crucial role in the onset of LBP among nurses. In particular, inadequate ergonomic conditions, along with tasks like patient transportation, lifting, and manual handling, are recognized as factors that elevate the risk of both acute and chronic LBP in nurses (Al Amer, 2020; Brusini, 2021; Lee et al., 2015; Rezaee & Ghasemi, 2014; Yassi & Lockhart, 2013).

Research has highlighted the significant impact of psychosocial factors on the development of LBP and musculoskeletal disorders (MSDs) in various professions. (Huang et al., 2002; Woods, 2005). In a study, high workload / low control increased the odds of having LBP among nurses OR:1.56 (95% CI:1.22-1.99) and 1.52 (95% CI:1.14-2.01) times more and low social support increased the odds of having back pain 1.82 (95% CI:1.43-2.32) times more. Furthermore, an imbalance between effort and reward has been found to elevate the risk of pain in any part of the body by 6.13 times (95% CI: 5.32–7.07) (Bernal et al., 2015). A study identified a significant link between nonspecific LBP in nurses and their perception of overload [OR:3.13 (95% CI: 1.62–6.05]. Inefficient work organization and adverse working conditions have been identified as factors that elevate the risk of LBP. (Cargnin et al., 2019). In the meta-analysis study, between high workload and experiencing neck pain or discomfort [OR 1.55 (95% CI: 1.39-1.72)] and between effort-reward imbalance and experiencing pain or discomfort in any body region [OR 2.56 (95% CI: 1.59-4.11)] a significant relationship was found (Ballester Arias & García, 2017). Another meta-analysis found a notable connection between LBP and work-related stress [OR: 1.71 (95% CI: 1.15-2.55)], as well as physical strain [OR: 1.76 (95% CI: 1.32-2.35)] (Du et al., 2021). The findings highlight a significant connection between workplace psychosocial factors and LBP in nurses. However, the role of social support as a potential moderator in this relationship has yet to be thoroughly investigated.

The purpose of this present study is to determine the prevalence of low back pain among nurses working in intensive care units and the association between psychosocial factors and low back pain.

MATERIAL AND METHODS

Study group

This research was carried out using a cross-sectional design and involved 127 nurses working in the ICUs of an urban hospital. The aim of the study was to reach all nurses working in ICUs. Of the nurses in the target population, 78.8% were reached.

Data collection tools

Data for the study were gathered through face-to-face interviews with participants, using a structured questionnaire.

The questionnaire comprises two sections: The first section consists of sociodemographic information of nurses (e.g., age, gender, parental status, night shift work, employment status, and weekly working hours), while the other assesses the severity of LBP in the past month and associated psychosocial factors. In addition, two measurement instruments were used to determine the psychosocial factors of the

employees. The initial section includes the Swedish Demand-Control-Support Questionnaire, followed by the Effort-Reward Imbalance scale in the second part.

Swedish Demand-Control-Support Questionnaire: One of the scales is the Swedish Demand-Control-Support Questionnaire. The questionnaire was adapted into Turkish by Demiral based on Karasek's Demand-Control-Support Questionnaire (Sanne et al., 2005). The scale, consisting of 17 items, had 4-point Likert-type response options. The scale is used to assess the psychological demands (workload), decision latitude (control) and social support. Job Strain scores were calculated through dividing the workload score by the decision latitude score. The decision latitude subscale includes an item called "job strain". If the score obtained from this item is higher than 1, it indicates increased job strain (Demiral et al., 2007).

Effort-Reward Imbalance Scale: The second scale employed in this study is Siegrist's Effort-Reward Imbalance scale (Siegrist et al., 2014). The scale consists of 3 dimensions and 23 items. The scale has three subscales: effort, reward and overcommitment. Imbalance scores were calculated through dividing the effort score by the reward score. Effort-Reward Imbalance scale adapted from Demiral et al. (Demiral et al., 2012).

Variables

The key outcome metric for this study is work-related LBP suffered within the last month. The participants were asked a single question and requested to respond as either "yes" or "no".

The independent variables of the present study included questions on working conditions and relationships in the workplace in addition to sociodemographic characteristics of individuals. Among the questions are the types of employment contract, working hours (night shift, shift work), weekly working hours. In addition, psychosocial scales scores were determined using questionnaires.

Statistical analysis

SPSS 15v was used to analyze the factors affecting low back pain. Univariate chi-square and t tests, multivariate logistic regression analysis were applied. The findings derived from the logistic regression analysis are expressed in terms of odds ratios (OR) accompanied by 95% confidence intervals (95% CI).

Ethical considerations

All protocols involving human participants adhered strictly to the ethical guidelines set forth by the appropriate institutional and national research authorities. Moreover, the study adhered to the principles outlined in the 1964 Helsinki Declaration, including its subsequent revisions. Additionally, the research followed other relevant ethical guidelines. The Ethics Committee of Tepecik Education and Research Hospital granted approval for the study protocol (approval no/date: 47/24/4/2013/36). The institutional review board confirmed the informed consent process. All participants provided informed consent after receiving a comprehensive explanation about the study's goals, potential benefits, and the confidentiality protocols to ensure their privacy.

Table 1. Sociodemographic characteristics and the prevalence of LBP among nurses.

Variables		n	%
Gender	Male	16	12.6
	Female	111	87.4
Having children	Yes	52	40.9
	No	75	59.1
Marital status	Married	71	55.9
	Single	56	44.1
Smoking status	Smoker	61	48.0
	Former smoker	16	12.6
	Never smoker	50	39.4
Presence of a chronic disease	Yes	20	15.7
	No	107	84.3
Inappropriate ergonomic behaviors	Sometimes	33	26.0
	Always	94	74.0
Working the nightshift	Yes	116	91.3
	No	11	8.7
Employment status	Contracted employee	19	15.0
	Permanent employee	108	85.0
Intensive care unit worked in	Pediatric	44	34.6
	Adult	83	65.4
LBP (within the last month)	Yes	90	70.9
	No	37	29.1
	Mean±SD	**Median (min-max)**	
Recurrence of LBP (within the last month)	7.6±7.8	4 (1-30)	
Age	32.4±6.3	33 (20-57)	
Weekly working hours	49.1±7.0	48 (40-80)	
Professional seniority	11.0±6.8	11 (1-28)	

RESULTS

65.4% of the participants worked in adult ICUs, while 34.6% were employed in pediatric ICUs. 87.4% were female, 55.9% were married, 91.3% worked the night shift and 15.0% were employed contracted. The participants' mean age was 32.4 ± 6.3 years (Table 1). About three-fourths (70.9%) of the participants suffered LBP within the last month. The median frequency of LBP recurrence in the last month is 4. While some of the participants had LBP complaints after their shifts, some had LBP because they lifted patients, had to work standing or had to give care to the patient in an inappropriate position.

Based on the univariate analysis, female participants and those working the night shift suffered LBP more. In addition, those who lacked social support and achieved high effort and low reward scores suffered LBP more (Table 2).

Table 2. Univariate analysis of variables linked to LBP in nurses.

Variables	Low back pain				$\chi 2$	p
	Yes		No			
Gender	**n**	**%**	**n**	**%**		
Male	6	37.5	10	62.5	9.871	**0.002**
Female	84	75.7	27	24.3		
Having children						
Yes	39	75.0	13	25.0	0.729	0.393
No	51	68.0	24	32.0		
Smoking status						
Smoker	45	73.8	16	26.2	0.955	0.620
Former smoker	12	75.0	4	25.0		
Never smoker	33	66.0	17	34.0		
Presence of chronic disease						
Yes	12	60.0	8	40.0	1.358	0.244
No	78	72.9	29	27.1		
Inappropriate ergonomic behaviors						
Sometimes	19	57.6	14	42.4	3.814	0.074
Always	71	75.5	23	24.5		
Working the nightshift?						
Yes	86	74.1	30	25.9	6.944	**0.008**
No	4	36.4	7	63.6		
Employment status						
Contracted employee	13	68.4	6	31.6	0.065	0.799
Permanent employee	77	71.3	31	28.7		
Intensive care unit worked in						
Pediatric	35	79.5	9	20.5	2.456	0.117
Adult	55	66.3	28	33.7		
Quantitative variables	**n**	**Mean±SD**	**n**	**Mean±SD**	**t**	**p**
Workload	90	94.7±11.1	37	91.9±12.5	1.247	0.215
Decision latitude (control)	90	65±20.1	37	70.2±20.2	-1.329	0.186
Job strain	90	1.4±0.3	37	1.3±0.3	1.503	0.135
Social support	90	53.5±21.6	37	63.4±17.4	-2.461	**0.015**
Effort	90	20.4±4.3	37	18.5±4.9	2.126	**0.035**
Reward	90	29.5±10.6	37	34.2±12.0	-2.215	**0.029**
Effort-reward imbalance	90	1.9±1.0	37	1.5±0.9	1.924	0.057
Overcommitment	90	16.7±3.6	37	16.2±3.7	0.710	0.479
Age	90	32.3±6.6	37	32.6±5.6	-0.254	0.800
Weekly working hours	90	49.7±7.5	37	47.4±5.6	1.709	0.090
Professional seniority	90	10.9±6.9	37	11.3±6.8	-0.289	0.773

SD: standart deviation.

Based on the final reduced model results from the multivariate logistic regression analysis, women [OR: 6.56 (95% CI: 1.98-21.73)] and those who worked the night shift [OR: 6.62 (95% CI: 1.68-26.09)] suffered back pain more. The findings also indicated that having social support at work [OR:0.97 (95%CI:0.95-0.99)] provided a protective effect against LBP ($p < 0.05$) (Table 3).

Table 3. Factors linked to LBP in nurses and outcomes from the reduced final logistic regression model.

Variables	OR [95% CI]
Age	Ns
Gender (female)	6.56 [1.98-21.73]**
Working the nightshift	6.63 [1.68-26.09]**
Social support	0.97 [0.95-0.99]*
Effort	Ns
Reward	Ns

Ns: Non Significance; *p<0.05; **p<0.01

DISCUSSION

In this investigation, 70.9% of the participants indicated that they had experienced LBP during the past month. However, prevalence rates vary across studies. For instance, an older study reported a six-month prevalence of LBP lasting three or more days at 28.0%. (Skovron et al., 1987). In contrast, a study conducted among Italian nurses reported one-year prevalence of LBP as high as 86% (Corona et al., 2005). Among Japanese nurses, the four-week prevalence of LBP was reported as 58.7%, while the annual prevalence was 75.9% (Fujii et al., 2019). A study conducted in Turkiye reported a lifetime prevalence of LBP at 84.0%, while the point prevalence was found to be 63.0% (Arasan et al., 2009). A study by Lee et al. carried out in California found that 61.7% of nurses across various healthcare sectors experienced low back pain. In the same investigation, 71.4% of nurses in long-term care units reported experiencing LBP, consistent with the results of the current study (Lee et al., 2015). The findings indicated that the variations in LBP severity were influenced not only by the methods of measurement but also by the participants' perceptions of their pain. Therefore, it is crucial to obtain baseline results during staff recruitment and follow up at regular intervals, as this ensures the comparability and consistency of the findings over time.

In this research, female participants and those who worked the night shift suffered LBP more. Many studies with similar findings have reported that LBP is more prevalent among female nurses (Abolfotouh et al., 2015; Al Amer, 2020; Choobineh et al., 2010; Rezaee & Ghasemi, 2014; Sun et al., 2021) and among women working in other professions (Cherry et al., 2001; Strazdins & Bammer, 2004) than was LBP among their male counterparts. In their study, Dahlberg et al. reported that of the men and women engaged in similar types of work, women suffered a higher incidence of musculoskeletal symptoms. This is probably not only because of biological differences but also because of ergonomic disposition inappropriate for the female body and non-paid activities such as housework, childcare, etc. which are mostly carried out by women (Dahlberg et al., 2004). Strazdins & Bammer reported that being female or parent made the participants more vulnerable to musculoskeletal problems (Strazdins & Bammer, 2004). In the present study, gender-related factors were also considered as potential contributors to LBP. Despite expectations, age did not show a significant link to the development of LBP. A similar result was determined in the meta-analysis study of Sun et al. (Al Amer, 2020; Sun et al., 2021). This lack of significant relationship may be attributed to the relatively young age group in the study, which had similar exposures to the risk factors for LBP.

Alternatively, working at nights necessitates long working hours without a break, and giving care to, lifting and transporting of patients with no help. Difficult interventions performed alone and without support especially by nurses providing patient care (Lee et al., 2015; Rezaee & Ghasemi, 2014; Serranheira et al., 2012), working the night shift and long working hours have been reported as risk factors in various studies (Abolfotouh et al., 2015; Strazdins & Bammer, 2004; Sun et al., 2021). The nurses participating in this present study worked 12 hours or longer on the night shifts. Thus, when they worked the night shift, they were exposed to physical burden for longer periods.

No significant relationship was determined between LBP and two of the psychosocial factors investigated by this study: workload and control. The findings of various studies examining the link between psychosocial factors and LBP differ across research. Alexopoulos et al. conducted two studies. The first study revealed no significant correlation between workload and LBP (Alexopoulos et al., 2003), however, in the second one, they determined that workload affected LBP of Dutch nurses but not that of Greek nurses (Alexopoulos et al., 2006).

In the study by Bos et al., the univariate analysis showed a significant association between workload and LBP, particularly among those working in ICUs. However, in multivariate comparisons, the relationship was not significant (Bos et al., 2007). Similar results were obtained in Magnago et al.'s study too (De Souza Magnago et al., 2010). However, several other studies have reported a significant association between LBP and psychosocial stress. (Choobineh et al., 2010; Du et al., 2021; Golabadi et al., 2013).. In Bernal et al.'s meta-analysis, excessive workload and low control have been found to affect LBP (Bernal et al., 2015). In this study, participants with LBP exhibited higher workload scores and lower control scores, but the association was not statistically significant. The findings could be influenced by the limited sample size, as the study did not encompass the entire population.

In this study, univariate analysis identified a significant association between LBP and the effort-reward imbalance within the psychosocial factors. Nonetheless, the multivariate analysis did not show a significant relationship. The literature reveals a gap in studies exploring the connection between musculoskeletal complaints and effort-reward imbalance. In Weyers et al.'s study, a significant relationship was reported between musculoskeletal complaints and the effort-reward imbalance among Danish nurses (Weyers et al., 2006). In their study, Herin et al. investigated upper body-related complaints and found a significant relationship those complaints and the effort-reward imbalance (Herin et al., 2011). Similar results were reported in the meta-analysis study of Ballester Arias & García (2017), as a significant relationship between effort/reward imbalance and pain/discomfort in any body region (Ballester Arias & García, 2017). In the present study, no part of the upper body was investigated; only its

relationship with LBP was determined. The results were relatively consistent with the results in the literature.

Many studies in the literature have primarily focused on the health outcomes associated with physical exposure (Barzideh et al., 2014; Habibi et al., 2012; Rezaee & Ghasemi, 2014). On the other hand, social support, an important impact factor among psychosocial factors, has an important place because social support at work can change harmful effects of physical and ergonomic conditions. Therefore, many studies and reviews report that social support is significantly associated with health outcomes (Hughes et al., 1997; Sadeghian et al., 2015; Skov et al., 1996; Urquhart et al., 2013; Woods, 2005). In this study, social support was significantly linked to LBP in both univariate and multivariate analyses.

Limitations and Strengths

The present study has both advantages and limitations. A key constraint of this research is the small number of participants. Another limitation is that the study involved only nurses from ICUs, which may limit the applicability of the findings to other healthcare settings. One more limitation to consider is its cross-sectional design, which restricts the ability to draw definitive conclusions about causal relationships. One of the key strengths of this study lies in its recruitment of nurses working exclusively in ICUs. The use of direct interviews in data collection further boosts the credibility of the study's findings.

CONCLUSION

The absence of adequate social support was identified as a significant contributor to the progression of LBP in ICU nurses. Additionally, univariate analysis indicated that the imbalance between effort and reward was a significant modifier. The results indicate that psychosocial risk factors have a significant impact on nurses working in ICUs. To prevent LBP, it is essential to provide adequate social support and ensure a balanced effort/reward structure. Conducting similar studies in the future through follow-ups will help better understand cause-effect relationships of psychosocial factors in MSDs among nurses.

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Conflict of Interest

The authors declare no potential conflicts of interest regarding the research, authorship, and/or publication of this article.

Author Contributions

Plan, design: HB, SV, BU, EY; **Material, methods and data collection:** HB, SV, BU, EY; **Data analysis and comments:** HB, SV; **Writing and corrections:** HB, SV, BU, EY.

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Ethical Approval

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Determination of Post-Earthquake Stress and Anxiety Levels of Individuals in Kahramanmaraş Province, the Center of the Earthquake

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ABSTRACT

Objective: This study aimed to examine the frequency of post-traumatic stress disorder (TSSS), anxiety, and depression disorders in victims of the February 6, 2023, earthquake in Turkey. **Materials and Methods**: This study was carried out in Kahramanmaraş province, which was the most damaged by the earthquake, six months after the earthquake that shook Turkey on February 6, 2023. In the research, a personal information form was used to collect demographic data and a Traumatic Stress Symptom Scale was used to evaluate TSSS symptoms. The Earthquake Anxiety Attitude Scale was used to measure anxiety levels.**Results:** The mean age of the 570 participants was 28.86±10.71 years, and 77.5% were female. 65.1% of the participants were single, 48.4% had less income than expenses, 78.9% had a university degree or higher, and 51.2% were unemployed. The study revealed the presence of significant mental health problems. 58% of participants reported high levels of anxiety, 55% had symptoms of post-traumatic stress disorder (TSSS), and 43% had comorbid depression with TSSS. The study found a strong and positive relationship between earthquake anxiety and the Traumatic Stress Symptom Scale. **Conclusion:** The results of our study showed that a significant portion of earthquake victims in Turkey experienced mental health problems such as TSSS, anxiety, and depression even 5 months later. These findings clearly demonstrate that the traumatic effects of the earthquake can be long-lasting and that immediate and long-term mental health support is needed in affected areas. The importance of long-term mental health interventions to improve mental health after the earthquake is emphasized.

Keywords: Earthquake centred in Kahramanmaraş, mental health, post-traumatic stress disorder

Depremin Merkezi Kahramanmaraş İlinde Bireylerin Deprem Sonrası Stres ve Kaygı Düzeylerinin Belirlenmesi

ÖZ

Amaç: Bu çalışma, 6 Şubat 2023 depreminin Türkiye'deki mağdurlarda travma sonrası stres bozukluğu (TSSB), anksiyete ve depresyon bozukluğu sıklığını incelemeyi amaçlamıştır. **Gereç ve Yöntem:** Bu çalışma, 6 Şubat 2023 tarihinde Türkiye'yi sarsan depremden altı ay sonra, depremden en çok etkilenen Kahramanmaraş ilinde gerçekleştirilmiştir. Araştırmada demografik verilerin toplanmasına yönelik kişisel bilgi formu, TSSB belirtilerini değerlendirmek için Travmatik Stres Belirti Ölçeği. Kaygı düzeylerini ölçmek için Deprem Kaygısına İlişkin Tutum Ölçeği kullanıldı.

Bulgular: Çalışmaya katılan 570 katılımcının yaş ortalaması 28,86±10,71 yıl olup, %77,5'i kadındı. Katılımcıların %65,1'i bekar, %48,4'ünün geliri giderinden azdı, %78,9'unun üniversite veya daha yüksek derecesi vardı ve %51,2'si işsizdi. Çalışmada önemli ruhsal sağlık sorunlarının varlığı ortaya konuldu. Katılımcıların %58'i yüksek düzeyde kaygı yaşadığını, %55'inde travma sonrası stres bozukluğu (TSSB) belirtileri olduğunu ve %43'ünde TSSB ile birlikte eş zamanlı depresyon bulunduğunu bildirdi. Çalışmada deprem kaygısı ile Travma Stres Belirti Ölçeği arasında güçlü ve pozitif bir ilişki bulundu.

Sonuç: Çalışmamızın sonuçları, Türkiye'deki depremzedelerin önemli bir kısmının 5 ay sonra travma sonrası stres bozukluğu (TSSB), anksiyete ve depresyon gibi ruh sağlığı sorunları yaşadığını göstermiştir. Bu bulgular, depremin travmatik etkilerinin uzun süreli olabileceğini ve etkilenen bölgelerde acil ve uzun vadeli ruh sağlığı desteğine ihtiyaç olduğunu açıkça ortaya çıkarıyor. Deprem sonrası ruh sağlığını iyileştirmek için uzun süreli ruh sağlığı müdahalelerinin önemi vurgulanmaktadır.

Anahtar Kelimeler: Kahramanmaraş merkezli deprem, ruh sağlığı, travma sonrası stres bozukluğu.

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INTRODUCTION

On February 6, 2023, two strong earthquakes occurred during the day, with a magnitude of 7.7 at 04:17 local time in Kahramanmaraş-Pazarcık district and 7.6 at 13:26 in Kahramanmaraş-Elbistan district. The earthquakes, which affected a geographically wide area, were felt in many provinces (Kahramanmaraş Diyarbakır, Malatya, Hatay, Gaziantep, Kilis, Adıyaman, Elazığ, Osmaniye, Adana, Şanlıurfa). The earthquakes caused over 50 thousand people to lose their lives and over 100 thousand to be injured (Azap, 2023).

Post-earthquake trauma, housing problems, environmental health problems, psychological distress, changes in diet, lack of physical activity, and loss of health workers (482 people) (Azap, 2023) and inadequate health services due to physical damage caused by the earthquake negatively affected the physical and mental health of individuals and reduced their quality of life. In addition, individuals who survived the earthquake experienced intense stress and anxiety for reasons such as injury, fear of death, separation from family members, loss of first-degree relatives, economic losses, and displacement (Kono & Shinew, 2015). If these symptoms are not controlled and reduced, they become serious mental problems (Valladares-Garrido et al., 2022). For example, a meta-analysis conducted following the Haiti earthquake in 2020 found that the human and material damages caused by the earthquake were traumatic enough to trigger serious symptoms of post-traumatic stress disorder (TSSS), depression, anxiety, and other mental health problems. (Cénat et al., 2020). Again, in the study conducted after the Nepal earthquake, it was stated that the incidence of anxiety and depressive symptoms and post-traumatic stress disorder in people exposed to earthquakes was high even after one year (Thapa et al., 2018). In a study conducted after the Izmir earthquake in Turkey, it was reported that individuals with high anxiety sensitivity may experience higher peritraumatic dissociation, and these individuals may have a higher risk of TSSS (Uğur et al., 2021). In a study conducted on the youth population in Ecuador after the 2016 earthquake, high levels of depression, post-traumatic stress, and anxiety were found in those who had suffered particularly severe economic damage to their families. High rates of unemployment among parents, coupled with a lack of hope and optimism for the future, have been reported to be associated with a condition that can lead to emotional distress and psychological disorders (Gerstner et al.,2020). In a retrospective study conducted after the Pohang 2017 earthquake, it was found that there was a twofold increase in the risk of developing anxiety and stress-related disorders in the days after the earthquake (Han, 2022). In 2008, it was reported that the incidence of TSSS in individuals directly or indirectly affected by the earthquake in Schuan (China) was between 21.5% and 41.0% (Eisma et al., 2019). In studies conducted after major earthquakes, 54% of adults were diagnosed with depressive disorders (Rajabi vd., 2022).

Based on the literature data, it is very important to measure many psychological problems such as stress, depression, and anxiety in individuals who have experienced the earthquake, to intervene early in the problems, and to learn how to approach the psychological traumas that occur in society (Kotozaki & Kawashima, 2012; Zhang vd., 2018).

Nurses, who are important service providers of the health system, are involved in every stage of this psychological process with their professional equipment, knowledge and clinical skills, communication skills, mastery of meeting the need for psychological support, personal competencies such as resilience and creativity in caregiving, ethical responsibilities, and skills in caring for the injured (Kesgin, 2023). This study, which we planned to determine the risk of mental disorders, TSSS, and anxiety states in individuals after the earthquake and to offer solutions, is aimed to contributing to the literature. In line with the objectives, answers to the following questions were sought:

- What is the level of stress in individuals after the earthquake?
- What is the level of anxiety in individuals after the earthquake?
- What is the level of depression in individuals after an earthquake?
- Is there a relationship between stress, depression and anxiety levels in individuals after an earthquake?

MATERIALS AND METHODS

Study type

This study was conducted as a descriptive and correlational study. The research was conducted between July 15 and August 5, 2023 in Kahramanmaraş.

Study group

The study population consists of adults who experienced the earthquake in the province of Kahramanmaraş. According to 2023 data, the population of Kahramanmaraş is 1,183,977. The OpenEpi program was used to determine the sample size of the study (https://www.openepi.com). By calculating the sample size with the OpenEpi program with a 50% observation rate, a 5% margin of error, and a 97% power interval, it was calculated that 471 people should be included in the study. The study was completed with the participation of 570 people. The informed consent section was added for the first individuals in the prepared online data collection, and after the consent of the individuals who were divided into parts, the data collection formula was continued. The dependent variables of the earthquake are stress and anxiety levels. The independent variables are socio-demographic and descriptive characteristics related to the earthquake. The criteria for inclusion in

the study were: being over 18 years of age, living in the province of Kahramanmaraş, and being able to read and write.

Procedures

Using a virtual snowball sampling approach, data were collected online via Google Form from individuals affected by earthquakes in Kahramanmaraş province. The data of the study were collected by using "Personal Introduction Form", "Traumatic Stress Symptom Scale" and "Attitude towards Earthquake Anxiety Scale".

Personal Introduction Form: The researcher prepared the descriptive information form based on the relevant literatüre (Fong vd., 2022; Sharma vd., 2021)This form consists of questions about the participants' age, gender, marital status, employment status, place of residence, loss of first-degree relatives (if any), whether they received psychological support, use of psychiatric medication after the earthquake, and use of substances (cigarettes, alcohol) after the earthquake.

Traumatic Stress Symptom Scale (TSSS): The self-report scale developed by Başoğlu et al. (Başoğlu et al., 2001) to determine possible TSSS and depression accompanying TSSS in the last month in individuals, each item receives a score between 0-3 and consists of a total of 23 items. The first 17 items question TSSS symptoms specified in DSM-IV and the last six items question depression symptoms. A score of 25 and above on these 17 items indicates possible/probable TSSS, while a score of 38 and above on the 23 items indicates depression accompanying possible TSSS. Cronbach's alpha coefficient of the scale was reported as 0.81 and calculated as 0.91 in this study. In the validity and reliability study of the scale, Cronbach's alpha values were 0.94 for the whole scale, 0.93 for the TSSS dimension, and 0.82 for the depression dimension. In this study, Cronbach's alpha value was 0.963 for the whole scale, 0.954 for the TSSS dimension, and 0.88 for the depression dimension.

Attitude towards Earthquake Anxiety Scale (ASES): The scale is made up of 34 items. Each item on the scale is worth a minimum of 1 point and a maximum of 5 points. The scale was developed by Bal and Akgül (Bal & Akgül, 2023). The lowest score obtained from the total items is 34 and the highest score is 170. The total result obtained by summing the scores given to the items in the scale determines the earthquake anxiety level according to the following scoring. 0-34 indicates normal, 35-70 low, 71-120 moderate, 121-170 high anxiety level. The aim of this scale is to assess the level of anxiety experienced by individuals after an earthquake. The scale includes questions such as "I have less desire to talk to others after the earthquake," "I am more easily startled," "I feel tired and fatigued," "My heart rate has increased," and "I have less joy in life." In addition, test-retest and alpha reliabilities were calculated to prove the reliability of the scale and found to be 0.87 (Bal & Akgül, 2023). In this study, the Cronbach's alpha value of the scale was 0.962.

Statistical analysis

IBM SPSS 25.00 package program was used for data analysis. In the statistical analysis, number and percentage distribution, and mean standard deviation were used to evaluate the sociodemographic variables. Skewness and skewness tests were used to evaluate the conformity of the data to normal distribution.

Kurtosis normality distribution test was performed. According to George and Mallery (2010); if the Skewness and Kurtosis values are between +2.0 and -2.0, it means that the scales and dimensions used are normally distributed and parametric tests should be used (George & Mallery, 2010). In this context, since the Skewness and Kurtosis values of the scales used in the study were between +1.5 and -1.5, the ındependent Sample t Test, One-Way Analysis of Variance and Pearson Correlation test were used to determine the relationship between the scale scores. Tukey test and Games-Howell test were used according to the homogeneity of variance to determine from which groups the difference originated as a result of variance analysis. The statistical significance level was accepted as $p<.0.05$.

Ethical considerations

Approval was obtained from Mardin Artuklu University health sciences non-interventional clinical research ethics committee (Date:10.07.2023, Approval no: 2023/7-10). Consent for participation in the study was obtained from all participants.

RESULTS

The mean age of the individuals participating in the study was 28.86±10.71. 77.5% of the individuals were female, 65.1% were single, 48.4% had income less than expenses, 78.9% were university graduates and above, and 51.2% were not employed in any job (Table 1).

While 96.7% of the individuals who participated in the study did not lose a first-degree relative, 8.1% received psychological support after the earthquake. At the same time, 89.3% of the individuals did not use any psychiatric medication after the earthquake, while 6.5% stated that they used antidepressant medication. It was found that 16.1% of the individuals started smoking and 1.4% started drinking alcohol after the earthquake (Table 2).

Table 1. Distribution of individuals according to socio-demographic characteristics (n=570).

Features		**Min-Max**	**Mean±SD**
Age (years)		18-68	28.86±10.71
		n	**%**
Gender	Female	442	77.5
	Male	128	22.5
Marital status	Married	199	34.9
	Single	371	65.1
Income status	Income less than expenditure	276	48.4
	Income equals expenditure	234	41.1
	Income more than expenditure	60	10.5
Education status	Literate	6	1.1
	Primary - Secondary School	21	3.7
	High School	93	16.3
	University and higher education	450	78.9
Employment status	Works in any job	272	47.7
	Does not work in any job	292	51.2
	Pensioner	6	1.1

Mean: Average, SD: Standard deviation.

Table 2. Distribution of descriptive characteristics of individuals related to earthquake (n=570)

Features		**n**	**%**
Place of stay	Own house	428	75.1
	House of relatives or friends	89	15.6
	Container	38	6.7
	Tent	15	2.6
Lost 1st degree relatives	Father or mother	8	1.4
	Sibling	11	1.9
	No casualties	551	96.7
Receiving Psychological Support	Yes	46	8.1
	No.	524	91.9
Use of psychiatric medication after the earthquake	None	509	89.3
	Antidepressant medication	37	6.5
	Anxiety medication	7	1.2
	Sleep medication	17	3.0
New habits after the quake	Cigarette	92	16.1
	Alcohol	8	1.4
	None	470	82.5

Mean: Average, SD: Standard deviation.

It was found that 58.1% of the individuals who participated in the study had high anxiety levels, 55.6% had TSSS and 43.5% had TSSS+depression. The mean earthquake anxiety scale score was 122.96±26.44 and the mean traumatic stress symptoms scale score was 35.29±16.54 (Table 3).

Table 3. Earthquake anxiety and TSSS levels of individuals.

		n	%
Earthquake Anxiety Level	Normal (0-34 points)	2	0.4
	Low (35-70 points)	21	3.7
	Medium (71-120 points)	216	37.9
	High (121-170 points)	331	58.1
TSSS Level	Non-traumatic	253	44.4
	TSSS (≥25 points)	317	55.6
	TSSS+Depression (≥38 points)	248	43.5
Scale Score Averages		**Min-Max**	**Mean± SD**
Earthquake Anxiety Scale		34-170	122.96±26.44
Traumatic Stress Symptoms Scale		0-69	35.29±16.54

Mean: Average, SD: Standard deviation.

It was found that the mean scores of the Earthquake Anxiety Scale and TSSS were higher in women than in men. At the same time, it was found that the mean scores of the Earthquake Anxiety Scale and Traumatic Stress Symptoms Scale of individuals with low income were higher than those with high income and income equal to expenditure, and this difference was statistically significant (Table 4, $p<0.05$).

Table 4. Comparison of mean scores of earthquake anxiety scale and traumatic stress symptoms scale according to socio-demographic characteristics of individuals.

Variables		n	Earthquake Anxiety Scale Mean±SD	Traumatic Stress Symptoms Scale Mean±SD
Gender	Woman	442	126.18±24.59	37.01±16.00
	Male	128	111.83±29.55	29.35±17.05
	Test value, p		t=5.544, **p=0.001**	t=4.702, **p=0.001**
Marital status	Married	199	123.78±24.80	34.28±15.05
	Single	371	122.52±27.31	35.83±17.28
	Test value, p		t=0.546, p=0.586	t=-1.113, p=0.266
Income status	Income less than expenditures[a]	276	126.77±27.25	38.31±16.74
	Income equals expenditures[b]	234	119.98±24.32	33.00±15.09
	Income more than expenditures[c]	60	117.06±28.43	30.33±18.53
	Test value, p		F=5.939, **p=0.003 a-b, a-c**	F=9.850, **p=0.001 a-b, a-c**
Education status	Literate	6	145.50±19.27	49.66±16.81
	Primary - Secondary School	21	131.80±24.50	38.38±17.27
	High School	93	122.68±28.75	34.89±17.22
	University and higher education	450	122.30±25.98	35.04±16.31
	Test value, p		F=2.347, p=0.072	F=1.814, p=0.144
Employment status	Works in any job	272	122.52±25.31	33.88±15.88
	Does not work in any job	292	123.38±27.58	36.67±17.04
	Pensioner	6	122.16±23.65	32.33±17.72
	Test value, p		F=0.077, p=0926	F=2.101, p=0.123

Mean: Average. SD: Standard deviation, a, b, c, d difference between groups, t: Independent groups t test, F: One-way analysis of variance

It was found that the mean scores of the Earthquake Anxiety Scale and Traumatic Stress Symptoms Scale were higher in those who lost a first-degree relative, received psychological support, used psychiatric drugs after the earthquake, and started smoking and alcohol after the earthquake, and this difference was statistically significant (Table 5, p<0.05).

Table 5. Comparison of the mean scores of the earthquake anxiety scale and traumatic stress symptoms scale according to the descriptive characteristics of the individuals related to the earthquake.

Variables		n	Earthquake Anxiety Scale Mean±SD	Traumatic Stress Symptoms Scale Mean±SD
Place of stay	Own house	428	122.06±26.26	34.08±16.31
	House of relatives or friends	89	125.64±26.31	38,97±16.63
	Container	38	127.39±28.98	39.97±17.71
	Tent	15	121.53±26.17	36.13±15.56
	Test value, p		F=0.839, p=0.473	F=3.297, p=0.060
Lost 1st degree relatives	Father or mother[a]	8	140.37±14.84	48.00±14.61
	Brother[b]	11	137.45±6.68	44.90±6.84
	No casualties[c]	551	122.42±26.66	34.92±16.58
	Test value, p		F=3.531, **p=0.030 a-c, b-c**	F=4.411, **p=0.013 b-c**
Psychological support Alma	Yes	46	132.63±23.81	41.69±16.54
	No.	524	122.11±26.52	34.73±16.44
	Test value, p		t=2.598, **p=0.010**	t=2.752, **p=0.006**
After the earthquake Psychiatric drug use status	None[a]	509	121.14±26.44	34.03±16.19
	Antidepressant medication[b]	37	141.54±23.49	47.83±16.91
	Anxiety medication[c]	7	125.00±15.54	37.85±13.83
	Sleep medication[d]	17	136.11±15.97	44.70±13.46
	Test value, p		F=8.635, **p=0.001 a-b**	F=10.460, **p=0.001 a-b, a-d**
After the earthquake Starting a bad habit	Cigarette[a]	92	134.57±23.25	44.40±15.16
	Alcohol[b]	8	133.12±12.01	35.75±17.03
	None[c]	470	120.51±26.59	33.50±16.23
	Test value, p		F=11.907, **p=0.001 a-c, b-c**	F=17.669, **p=0.001 a-c**

*Mean: Average. SD: Standard deviation

*a, b, c, d difference between groups, t: Independent groups t test, F: One-way analysis of variance

A high positive correlation was found between the Earthquake Anxiety Scale and the Traumatic Stress Symptoms Scale (r=0.835, Table 6).

Tablo 6. The relationship between earthquake anxiety scale and traumatic stress symptoms scale (n=570).

Scales	Earthquake Anxiety Scale	Symptoms of Traumatic Stress Scale
Earthquake Anxiety Scale	1	
Symptoms of Traumatic Stress Scale	0.835*	1

*p<0.001.

DISCUSSION

This study investigated the levels of traumatic stress and anxiety experienced by people in the epicenter of the earthquake. The results showed that participants experienced high levels of traumatic stress, depression, and anxiety. Similarly, a study of people who survived the 2010 Haiti earthquake reported that one in four had severe post-traumatic stress disorder (TSSS), one in three had severe depression, and one in five had severe anxiety (Cénat vd., 2020).

Earthquakes affect the mental state of survivors and traumatize them individually for reasons such as injury, disability, fear of death, loss of family, economic destruction, and housing problems. This trauma can cause serious mental health problems by increasing the stress and anxiety levels of individuals (Kono & Shinew, 2015). For this reason, the identification of the problem and suggestions for solutions are very valuable. The findings from the research will be discussed with literature-supported studies and solution suggestions.

Literature review shows that most studies examining the prevalence of TSSS occurred approximately three months after the earthquake (Guo vd., 2014). In the study conducted five months after the earthquake, 58.1% of participants had high earthquake-related anxiety, 55.6% had high TSSS, and 43.5% had high TSSS and depression. This study examines the long-term effects of earthquakes and suggests that the observed differences may be due to various factors such as loss of family or home, unemployment, injury, gender, and coping skills {Citation}We may need to address these factors to reduce TSSS in the long term.

It was found that more than half of the participants in the study had anxiety and TSSS disorders, and almost half of them had both. In the literature, a study conducted 4–12 months after the Marmara earthquake (1999) found that the rate of post-traumatic stress disorder was 25% ((Tural vd., 2004). A retrospective study conducted after the Pohang earthquake reported that the risk of developing anxiety and stress-related disorders doubled one year later (Han, 2022). Again, the incidence of anxiety, depressive symptoms, and TSSS in individuals exposed to the Nepal earthquake was found to be high even one year later (Thapa vd., 2018). A study of TSSS, anxiety, and depression in adolescents six months after the 2008 Wenchuan earthquake in China found a prevalence of TSSS of 15.8%, anxiety of 40.5%, and depression of 24.5% (Fan vd., 2011). A study conducted three months after the Jiuzhaigou earthquake found that the prevalence of TSSS anxiety symptoms and depressive symptoms was 52.7%, 53.8%, and 69.6%, respectively. These results indicate a high prevalence of these symptoms, similar to our study (Xi vd., 2020). Examples in the literature support our research findings. Anxiety, stress, and depression can occur as a result of natural disasters and may increase mental health problems in the future (Lee & Lee, 2019).

The study found that women experienced higher levels of anxiety and stress than men after the earthquake. In terms of gender, women may experience more intense emotions than men because they have less access to positive social support after a natural disaster. They may also experience their emotions more severely because they are biologically more emotional than men (Mukherjee vd., 2014). In addition, women may be more exposed to factors associated with post-disaster depression due to their social status. In developing countries, women may be more affected than men by the destruction of their homes and migration situations (Bradshaw, 2004; Kipay, 2023) Similar studies show that women have high levels of anxiety and stress after an earthquake (Kocoglu vd., 2023; Kuo vd., 2003; Kurt & Gülbahçe, 2019). To be more effective in post-earthquake intervention efforts, it is necessary to focus more on this issue in order to reduce the impact of the earthquake on causing psychopathological effects on women, which is a sensitive aspect of society. Specific studies are needed to strengthen psychological well-being, taking into account women and their physiological characteristics.

The study found that people with lower income levels had higher levels of stress and anxiety after the earthquake. This is one of a number of similar findings in the literature. Loss of work and property after an earthquake increases the risk of psychological problems such as TSSS and depression in individuals (Cerdá vd., 2013; Cofini vd., 2015; Gigantesco vd., 2013). Economic status is important in completing Maslow's hierarchy of needs (Lenthe vd., 2015). In order to prevent the severe material consequences of the earthquake, government-supported employment programs should be focused on as soon as possible after the earthquake, and individuals' economic wounds should be healed. In the study, individuals who lost their first-degree relatives in the earthquake

had higher levels of post- earthquake stress and anxiety. In particular, the loss of a mother and father was found to cause anxiety disorder, and the loss of siblings was found to cause stress disorder. In the study examining the general health status of parents who lost their children in the Bam earthquake 10 years later, it was reported that the category of "anxiety/insomnia" was higher (Rashidinejad et al., 2015). The loss of a child in the 2008 earthquake in China was reported to be a strong cause of TSSS for parents. In addition, it was stated that the loss of parents and siblings would cause TSSS (Chan CL et al., 2011). Also ın another study, parents were buried in the earthquake or lost their children. These parents stated that they felt guilty because their children died in the earthquake and they survived (Canel, Nilgün Azize, Balcı, 2009). Our study supports these results. The loss of a first-degree relative is a cause of trauma that will last for years and be transferred from generation to generation. Because some will never recognize their parents, some will feel and question the absence of their siblings for years. Some will live with a feeling of guilt for not being able to save their loved ones. The difference between anxiety and stress levels and psychological support was found to be statistically significant in the study. As earthquakes cause material and emotional destruction, people need psychological support to help them overcome their psychological damage. It is important to help people regain a sense of life and hope. When symptoms of trauma-related disorders occur in the early post-trauma period, psychological first aid should be provided first. Personalized therapies, structured therapy methods, and the use of drugs should be avoided as much as possible (Yıldız vd., 2023). It is important to organize the social environment, review the individual's relationship with relatives who can provide support, and allow emotional expression (Reyes-Valenzuela vd., 2021).
.The difference between the level of anxiety and stress and the use of antidepressant medication is statistically significant. There may be times when the individual cannot overcome the material and moral problems experienced after the earthquake alone. The damage from the February 6, 20223 Kahramanmaraş-centered earthquakes is unprecedented in our century. Therefore, it may have left more psychological sequelae than expected. For this reason, when the individual cannot regain his or her health on his or her own, he or she may resort to medical treatment. For example, an increase in the use of antidepressants was found after the L'Aquila earthquake (Trifirò vd., 2013). The rates of drug use 6 months after the earthquake in Italy were compared with the s a m e period a year ago, and it was reported that there was a 37% increase in new antidepressant prescriptions and a 129% increase in antipsychotic prescriptions (Rossi vd., 2011). These findings are consistent with previous studies showing increases in anxiety and antidepressant use after disasters (Han vd., 2017; Rossi vd., 2011).In the study, the statistical difference between stress and anxiety levels and smoking initiation (starting a bad habit) was significant. High stress and serious life changes may lead individuals to smoke. For example, after the Great East Japan earthquake, the prevalence of smoking and nicotine dependence levels among earthquake victims were still high even 3 years after the disaster (Osaki vd., 2020). Similarly, 24% of those who quit smoking after the Canterbury earthquakes started smoking again after the earthquake (Erskine vd., 2013). Other studies conducted after the earthquake found that rates of substance use among young people increased (Amiri vd., 2022; Bianchini vd., 2015; Nakano vd., 2018). Since the nervous system of individuals after trauma is agitated, victims may resort to smoking, alcohol, or other pharmacological drugs to suppress the mental distress experienced. To prevent this situation, the necessary psychological support infrastructure should be established (Nakajima, 2013). In the study, it was determined that there was a strong positive relationship between earthquake anxiety and the traumatic stress symptom scale. While the earthquake is a major trauma, the loss of family members as a result of this trauma increases the level of post-traumatic anxiety and stress. In the studies, it was found that those who experienced loss after the earthquake had higher levels of anxiety, depression, and post-traumatic stress disorder (Cerdá vd., 2013; Kurt & Gülbahçe, 2019; Türkkan & Hatipoğlu, 2024) It was reported that anxiety, post-traumatic stress, and depression levels were higher in individuals living outside their own homes after the earthquake. A similar finding was observed in a study conducted by Cofini et al. in 2015 after the Italian earthquake (Cofini vd., 2015). Shelter is a need related to the sense of trust, which is one of the most basic motives of people. Uncertainty about trust creates stress in individuals. Stress increases anxiety and stress production by secreting cortisol, adrenaline, and noradrenaline in the amygdala, hypothalamus, and adrenal glands of the brain (Kaba, 2019). After the earthquake, removing the remains of the earthquake as soon as possible, providing shelter and employment to the individual, and following up on the psychological processes can raise the hope of the individual and reduce the level of anxiety and stress.

CONCLUSION

This study assessed TSSS, depression, and anxiety levels after the earthquake. 570 people took part in the study. It was found that people had high levels of post-traumatic stress, depression, and anxiety after the earthquake. It was found that people who lost loved ones or experienced financial losses had higher levels of stress and anxiety. There was also an increase in smoking and an increase in anxiety and stress. A strong and positive relationship was found between earthquake anxiety and the Traumatic Stress

Symptom Scale. An increase in the use of antidepressants was also observed. Stress and anxiety levels were found to be high in individuals after the earthquake. We should not perceive these results only as individual outputs. With the logic that a healthy individual means a healthy society, it is necessary to carry out therapy programs that will reduce the stress and anxiety levels of individuals, support them, and raise their hopes through teams of experts in mental health at regular intervals in the earthquake region. It can be made compulsory for all health workers, especially doctors and nurses, to receive post-earthquake psychological first aid training. Since we are an earthquake country, a compulsory psychological first aid course can be included in the curriculum of all departments providing health education at the undergraduate and associate-graduate levels in universities. The number of social and spiritual counsellors who will provide services specific to the spirituality of each society can be increased. After the earthquake, the remains of the earthquake (building debris) can be removed as soon as possible, and employment of individuals can be employed.

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Effect of Hemodialysis on Cardiac Structures and Functions in Chronic Renal Disease Patients

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ABSTRACT

Objective: Although dialysis is a revolutionary treatment for chronic kidney disease, cardiac pathologies continue to be a major cause of morbidity and mortality. Early diagnosis of dialysis related cardiac changes prolongs survival. The aim of our study was to assess the cardiac differences between hemodialysis patients and patients not receiving dialysis with estimated glomerular filtration rate (eGFR) <30 ml/dk**. Materials and Methods:** A total of 50 hemodialysis patients and 50 patients not receiving dialysis with eGFR<30 ml/dk were included in this study. Baseline characteristics, echocardiographic findings, hematological and biochemical parameters were compared between groups. **Results:** Age and gender were similar between groups. Dialysis patients were 69.3±10.5 years of age and 50% were male, patients not receiving dialysis with eGFR<30 ml/dk were 72±10 years of age and 40 % were male. (p=0.150, p=0.211, respectively). Also, hypertension [36(72%) vs 33(66%), p=0.333], diabetes mellitus [23(46%) vs 22(44%), p=0.500] and coronary artery disease [26(52%) vs 23(46%), p=0.345] were similar between groups. Left ventricular hypertrophy [43(86%) vs 33(66%), p=0.035] and tricuspid regurgitation [43(86%) vs 32(64%), p=0.010] were more common in dialysis patients. Pulmonary artery systolic pressure (mmHg) was higher in dialysis patients [33(25-40) vs 25(20-35), p=0.018]. Also, hemoglobin (g/dl) [10.8±1.5 vs 11.6±1.7, p=0.020], hematocrit (%) [33.2±4.6 vs 35.6±5.9, p=0.032] levels were lower and anemia [45(90%) vs 37 (74%), p=0.033] was more frequent in hemodialysis patients. **Conclusion:** Left ventricular hypertrophy, tricuspid regurgitation were more common and pulmonary artery systolic pressure levels were higher in dialysis patients compared to the patients not receiving dialysis with eGFR<30 ml/dk. Also, hemoglobin levels were lower in dialysis patients. This study emphasizes the importance of regular echocardiographic assessment for early diagnosis and management cardiac patologies in dialysis patients.

Keywords: Chronic Kidney Disease, Echocardiography, Hemodialysis.

Kronik Böbrek Hastalarında Hemodiyalizin Kalp Fonksiyonları Üzerine Etkisi

ÖZ

Amaç: Diyaliz, kronik böbrek hastalarında çığır açan bir tedavi yöntemidir. Kronik böbrek hastalarında kardiyak patolojilere bağlı morbidite ve mortalite yaygındır. Diyalize bağlı gelişen kardiyak değişikliklerinin erken tanı ve tedavisi sürveyi uzatır. Bu çalışmanın amacı hemodiyaliz hastaları ile glomerüler Filtrasyon Hızı (eGFR) <30 ml/dk olan ve diyaliz almayan hastalar arasındaki kardiyak farklılıkları saptamaktır. **Gereç ve Yöntem:** Bu çalışmaya 50 hemodiyaliz hastası ve 50 eGFR<30 ml/dk olan ve diyaliz almayan hasta dahil edildi. Gruplar arasında demografik özellikler, ekokardiyografik bulgular, hematolojik ve biyokimyasal parametreler karşılaştırıldı. **Bulgular:** Gruplar arasında cinsiyet ve yaş yönünden fark yoktu. Diyaliz hastaları 69,3±10,5 yaşında ve %50'si erkek, eGFR<30 ml/dk olan ve diyaliz almayan hastalar ise 72±10 yaşında ve %40'ı erkekti. (sırasıyla p=0.150, p=0.211). Hipertansiyon [36(%72) karşı 33(%66), p=0.333], diyabet [23(%46) karşı 22(%44), p=0.500] ve koroner arter hastalığı [26(%52) karşı 23(%46), p=0.345] gruplar arasında benzerdi. Sol ventrikül hipertrofisi [43(%86) karşı 33(%66), p=0.035] ve triküspit yetersizliği [43(%86) karşı 32(%64), p=0.010) diyaliz hastalarında daha sıktı. Pulmoner arter sistolik basıncı (mmHg) diyaliz hastalarında daha yüksekti [33(25-40) karşı 25(20-35), p=0.018]. Ayrıca hemoglobin (g/dl) [10.8±1.5 karşı 11.6±1.7, p=0.020], hematokrit (%) [33.2±4.6 karşı 35.6±5.9, p=0.032] düzeyleri daha düşük ve anemi [45(90%) karşı 37(%74), p=0.033] hemodiyaliz hastalarında daha sık saptandı. **Sonuç:** Hemodiyaliz hastalarının, eGFR<30 ml/dk olan ve diyaliz almayan hastalar ile karşılaştırıldığında, sol ventrikül hipertrofisi, triküspit yetersizliği daha sık ve pulmoner arter sistolik basınçları daha yüksekti. Ayrıca diyaliz hastalarında hemoglobin seviyeleri daha düşüktü. Bu çalışma, hemodiyaliz hastalarında kardiyak patolojilerin erken tanısı ve tedavisi için düzenli ekokardiyografik değerlendirmenin önemini vurgulamaktadır.

Anahtar Kelimeler: Kronik Böbrek Hastalığı, Ekokardiyografi, Hemodiyaliz.

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INTRODUCTION

Chronic kidney disease (CKD) is a health problem associated with morbidity and mortality around the world. The estimated prevalence of CKD is 13.4% and patients needing dialysis treatment are between 4.902 and 7.083 million in the world (Levey et al., 2011; Lv & Zhang, 2019). Kidney and cardiovascular diseases share several risk factors, and cardiovascular diseases are frequently encountered in CKD patients. CKD patients having cardiovascular disease (CVD) had 3 to 30 times higher risk of mortality compared to the normal population (Muntner et al., 2013). It is notable that mortality due to CVD are more common than kidney failure among patients with CKD (Go et al., 2004).

Echocardiography is a fast and reliable method for the assessment of cardiac functional and structural abnormalities. Echocardiographic assessment can help to detect the early diagnosis of the CVD in patients of CKD. In a recent study, Tseng et al investigated the echocardiographic abnormalities and their relationship with adverse outcomes in kidney failure patients. They found that echocardiography can help clinicians optimize patient management and identify high risk patients (Tseng et al., 2024). Our study aimed to investigate the effect of the dialysis treatment on cardiac structures and functions in CKD patients.

MATERIALS AND METHODS

50 dialysis patients and 50 patients not receiving dialysis with the estimated glomerular filtration rate (eGFR) <30 ml/dk, who applied to the cardiology outpatient clinic for any reason were included in the study. Inclusion criteria were age >18 years of age and patients receiving hemodialysis for more than 1 year. Exclusion criteria was advanced disease patients requiring intensive care unit.

Body mass index (BMI) was calculated by dividing weight (kilograms) to height (meters) squared (Go et al., 2015). Anemia criteria was <12g/dL in women and <13g/dL in men according to the World Health Organization (WHO) (Cappellini & Motta, 2015). The eGFR was calculated by Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) (Pugliese et al., 2011).

Previously diagnosed with hypertension, using antihypertensive drug or patients having blood pressure ≥140/90 were defined as hypertensive. Left ventricular hypertrophy (LVH) was defined as intrerventricular or LV posterior wall thickness ≥12 mm (Jameel et al., 2020; Devereux et al., 1986).

Transthoracic echocardiography was performed using a Philips Affiniti 50 Ultrasound System. Each patient underwent two-dimensional transthoracic echocardiography according to the European Association of Echocardiography recommendations (Evangelista et al., 2008). Ejection fraction (EF) (%), left ventricular end diastolic diameter (LVEDD) (mm), left ventricular end systolic diameter (LVESD) (mm), pulmonary artery systolic pressure (PASP) (mmHg), right ventricular diameter (mm), ascending aorta diameter (mm), left atrium diameter (mm), left ventricular hypertrophy, valvular regurgitation and stenosis, diastolic functions calculated by early (E) and late (A) transmitral diastolic flow velocity, early diastolic annular velocity (E') and E/E' ratio were evaluated.

The ratio of peak E wave to A wave were measured using pulsed wave doppler echocardiography. Early (E') diastolic annular velocity was measured at the septal mitral annulus (Nagueh et al., 2009). Left ventricular diastolic patterns were classified into 4 groups. 1) Normal pattern: E/A>0.8 and with septal E'≥7cm/s; 2) Impaired relaxation pattern: E/A≤0.8 and abnormal E' wave; 3) Pseudonormal pattern: E/A=0.8-2.0 and abnormal E' wave; 4) Restrictive pattern: E/A>2.0 and abnormal E' wave (Matsuo et al., 2018).

Statistical analysis

SPSS 13.0 (SPSS Inc., IBM, Chicago, IL, USA) was used for statistical analyses. Kolmogorov-Smirnov test was used to analyze the distribution of the parameters. Normally distributed variables as mean±SD and abnormally distributed parameters are expressed as median and percentiles (25–75). Categorical variables were showed as percentages and frequencies. Categorical variables were tested with the Fisher's exact test or Chi-square. Normally distributed continuous parameters were evaluated with 2 tailed Student's T-test and abnormally distributed parameters with Mann-Whitney U test.

Ethical considerations

The study was conducted in accordance with the declaration of Helsinki and approved by The University's Ethics Committee (Date: 2018, Approval no: KÜ GOKAEK 2018/130).

RESULTS

A total of 50 hemodialysis patients and 50 patients not receiving dialysis with eGFR<30 ml/dk were included in this study. There was not any difference in gender and age between the groups. Dialysis patients were 69.3±10.5 years of age and 50% were male, patients not receiving dialysis with eGFR<30 ml/dk were 72±10 years of age and 40 % were male. (p=0.150, p=0.211, respectively). BMI (kg/m^2) were similar between groups (26.8±5.4 vs 28.6±5; p=0.178). Hypertension [36 (72%) vs 33 (66%), p=0.333], diabetes mellitus [23(46%) vs 22 (44%), p=0.500] and coronary artery disease [26(52%) vs 23(46%), p=0.345] were similar between groups. Also, anemia was more common in dialysis patients [45(90%) vs 37 (74%), p=0.033] (Table 1).

Table 1. Baseline characteristics of the groups.

	Hemodialysis patients (n=50)	Patients not receiving dialysis with eGFR<30 ml/dk (n=50)	p
Age (years)	69.3±10.5	72±10	0.150
Male/female	25/25 (50%-50%)	20/30 (40%-60%)	0.211
Body mass index (kg/m^2)	26.8±5.4	28.6±5	0.178
Hypertension	36 (72%)	33 (66%)	0.333
Diabetes mellitus	23 (46%)	22 (44%)	0.500
Coronary artery disease	26 (52%)	23(46%)	0.345
Anemia	45 (90%)	37 (74%)	0.033

In echocardiographic parameters; there was no significant difference in EF (%) [55(41-60) vs 55(50-60), p=0.333], LVEDD (mm) [48.8±6.2 vs 48.4±4.6, p=0.766], LVESD (mm) [34±7.7 vs 33.5±5.9, p=0.775], left atrium diameter (mm) [39±7.3 vs 37.5±5.1, p=0.312], ascending aorta (mm) [33 (31-36) vs 35 (32-37), p=0.458] and right ventricular diameter (mm) [25(22-27) vs 23(21-25), p=0.117] were similar between groups. PASP (mmHg) was higher in dialysis patients [33(25-40) vs 25(20-35), p=0.018]. LVH [43(86%) vs 33(66%), p=0.035] and tricuspid regurgitation [43(86%) vs 32(64%), p=0.010] were determined more common in dialysis patients compared to the patients not receiving dialysis with eGFR<30 ml/dk. Mitral regurgitation (p=0.165), aortic regurgitation (p=0.916), aortic stenosis (p=0.469) and pulmonary regurgitation (p=0.339) were similar between groups. E wave [70(60-105) vs 70(60-106), p=0.650], A wave [88±25 vs 93±26, p=0.564], E' wave [6(5-7.5) vs 6.5(5-7), p=0.770] and E wave/E' wave [10.8(10-16) vs 12(10-16), p=0.649] were not statistically different between groups (Table 2 and Table 3).

Table 2. Echocardiographic parameters of the groups.

	ESRD patients with undergoing dialysis (n=50)	Patients not receiving dialysis with eGFR<30 ml/dk (n=50)	p
Ejection fraction (%)	55 (41-60)	55 (50-60)	0.333
E wave	70 (60-105)	70 (60-106)	0.650
A wave	88±25	93±26	0.564
E' wave	6 (5-7.5)	6.5 (5-7)	0.770
E wave / E' wave	10.8 (10-16)	12 (10-16)	0.649
LVEDD (mm)	48.8±6.2	48.4±4.6	0.766
LVESD (mm)	34±7.7	33.5±5.9	0.775
Left atrium diameter (mm)	39±7.3	37.5±5.1	0.312
PASP (mmHg)	33 (25-40)	25 (20-35)	0.018
Right ventricular diameter (mm)	25 (22-27)	23 (21-25)	0.117
Ascending aorta diameter (mm)	33 (31-36)	35 (32-37)	0.458
Left ventricular hypertrophy	43 (86%)	33 (66%)	0.035
Diastolic dysfunction	40 (%80)	38 (%76)	0.405

LVEDD: Left ventricular end diastolic diameter (mm), LVESD: Left ventricular end systolic diameter (mm), PASP: Pulmonary artery systolic pressure (mmHg)

In hematological and biochemical parameters; hemoglobin (g/dl) [10.8±1.5 vs 11.6±1.7, p=0.020], hematocrit (%)[33.2±4.6 vs 35.6±5.9, p=0.032], eGFR (ml/min) [9.9±4 vs 22.3±5, p<0.001] levels were lower and creatinine (mg/dl) [5.5±1.7 vs 2.43±0.6, p<0.001], urea (mg/dl) [111±40 vs 93±33, p=0.020] levels were higher in dialysis patients compared to the patients not receiving dialysis with eGFR<30 ml/dk. Other Hematological and biochemical parameters were similar between groups (Table 4).

Table 3. Valve stenosis and regurgitations of the groups.

	ESRD patients with undergoing dialysis (n=50)	Patients not receiving dialysis with eGFR<30 ml/dk (n=50)	p
Mitral regurgitation			
Grade-1	20 (40%)	16 (32%)	0.165
Grade-2	11 (22%)	10 (20%)	
Grade-3	3 (6%)	0 (0%)	
Aortic Regurgitation			
Grade-1	12 (24%)	12 (24%)	0.916
Grade-2	10 (20%)	9 (18%)	
Grade-3	0 (0%)	0 (0%)	
Aortic stenosis			
Grade-1	6 (12%)	3 (6%)	0.469
Grade-2	2 (4%)	1 (2%)	
Grade-3	0 (0%)	0 (%)	
Tricuspid regurgitation			
Grade-1	24 (48%)	18 (36%)	0.010
Grade-2	12 (24%)	9 (18%)	
Grade-3	7 (14%)	5 (10%)	
Pulmonary regurgitation			
Grade-1	4 (8%)	2 (4%)	0.339
Grade-2	0 (0%)	0 (0%)	
Grade-3	0 (0%)	0 (0%)	

Table 4. Hematological and biochemical parameters of the groups.

	ESRD patients with undergoing dialysis (n=50)	Patients not receiving dialysis with eGFR<30 ml/dk (n=50)	P
Glucose (mg/dl)	134 (97-192)	117 (96-163)	0.250
HbA1c	6.1 (5.4-8.1)	6.3 (5.8-7.5)	0.510
Hemoglobin (g/dl)	10.8±1.5	11.6±1.7	0.020
Hematocrit (%)	33.2±4.6	35.6±5.9	0.032
Platelet (x1000/uL)	235±71	210±70	0.093
WBC (x1000/mm^3)	7.7 (6.2-9.5)	7 (5.7-8.7)	0.079
eGFR (ml/min)	9.9±4	22.3±5	<0.001
Creatinine (mg/dl)	5.5±1.7	2.43±0.6	<0.001
Urea (mg/dl)	111±40	93±33	0.020
AST (U/L)	16 (13-21)	18 (16-21)	0.075
ALT (U/L)	13 (10-15)	14 (11-17)	0.095
Total Cholesterol (mg/dL)	213±58	190±47	0.084
Triglyceride (mg/dL)	169 (110-224)	123 (86-228)	0.122
LDL (mg/dL)	120±44	113±36	0.474
HDL (mg/dL)	45±14	44±13	0.927
TSH (mIU/L)	1.2 (0.6-2.7)	1.5 (1.2-2.6)	0.150

WBC: White blood cell count, eGFR: Estimated glomerular filtration rate, AST: Aspartate transaminase, ALT: Alanine transaminase, LDL: Low-density lipoprotein, HDL: High-density lipoprotein, TSH: Thyroid Stimulating Hormone.

DISCUSSION

Dialysis treatment has revolutionized kidney failure patients and extended their lives. However, the most common cause of death is still cardiac causes in CKD patients. Early diagnosis and treatment of cardiac diseases can make a positive contribution to mortality and morbidity in dialysis patients. In this study, we have aimed to the functional and structural changes on echocardiography and blood parameters differences in dialysis patients compared to the patients not receiving dialysis with eGFR<30 ml/dk. Left ventricular hypertrophy, tricuspid regurgitation were more common and pulmonary artery systolic pressure levels were higher in dialysis patients.

LVH is a frequent structural cardiac abnormality in CKD patients. Also, LVH is a predictor for mortality, especially in dialysis patients (Parfrey et al., 1996). Ahmed HA et al. detected LVH in 80% of dialysis patients (Al Qersh et al., 2016). In a Zoccali et al.'s study, LVH was found in 77% of dialysis patients

(Zoccali et al., 2004). LVH is reported in 16–50% of stages 1–3 CKD patients, 50–70% of stages 4 and 5 CKD patients, and in 70–90% of dialysis patients (Liu et al., 2015). In our study, LVH was more common in dialysis patients. 86% of dialysis patients had LVH and 66% of patients not receiving dialysis with eGFR<30 ml/dk had LVH. Chronic hypervolemia triggers the LVH and arterial stiffness in dialysis patients (Abdelazim et al., 2022). The volume accumulated in the body between dialysis sessions increases preload and causes the LVH. Also, electrolyte imbalance, uremic toxins, metabolic and hematological changes especially anemia are other risk factors for LVH in dialysis patients.

Bhandari R. et al. (Bhandari et al., 2023) found that the most common echocardiographic finding was valvular heart disease which was detected in 78.5% of dialysis patients. Saxena et al.'s study, the major echocardiographic abnormality was tricuspid regurgitation in 66% of dialysis patients (Saxena et al., 2017). In our study, tricuspid regurgitation was more common in dialysis patients (86%). Grade 1 tricuspid regurgitation was 48%, Grade 2 tricuspid regurgitation was 24% and Grade 3 tricuspid regurgitation was 14% of the patients. Fluid balance is a critical component of the dialysis patients. The occurrence of chronic hypervolemia in these patients can lead to right ventricular overload resulting in tricuspit regurgidation and pulmonary hypertension. Also, due to the intermittant nature of dialysis therapy, in interdialytic periods, increases and decreases in volume may explain the frequent tricuspit regurgitation in dialysis patients.

Pulmonary hypertension has been frequently described in dialysis patients (Havlucu et al., 2007). Pulmonary hypertension is a progressive disorder with increased mortality and morbidity. Yigle et al. showed significantly lower survival rate in dialysis patients with pulmonary hypertension (Yigla et al., 2009). In our study, PASP was significantly elevated in dialysis patients compared to the patients not receiving dialysis with eGFR<30 ml/dk. Chronic volume overload, calcium and phosphate metabolism irregularities causing pulmonary artery calcification and increased blood flow from arteriovenous fistula may induce the higher pulmonary artery pressures (Mukhtar et al., 2014). Diastolic dysfunction is the extensive functional cardiac abnormality in echocardiography examination of dialysis patients. and Dialysis patients have a high incidence of diastolic dysfunction. LV diastolic dysfunction was 72.30% of the dialysis patients in Bhandari R et al.'s study (Bhandari et al., 2023). Farshid et al. demonstrated that the diastolic dysfunction was 86% of dialysis patients and diastolic dysfunction was a strong predictor for mortality (Farshid et al.,2013). In our study, LV diastolic dysfunction was 88% of the dialysis patients. However, there was no statistically significant difference between the groups.

Patients with chronic kidney disease had lower EF values compared to the normal individuals (Arshi et al., 2016). As expected, EF were lower in our study population. But we did not find significant differences between groups. Although it is not the subject of this study, the effect of dialysis on systolic functions is more evident in speckle tracking studies [. Yip et al., 2018; Terhuerne et al., 2021) and may be useful in evaluating the effect of dialysis on systolic functions compared to the ejection fraction.

In blood parameters; anemia is significantly related with mortality in dialysis patients (Shivendra et al., 2014). Adera et al. demontrates that the prevalence of anemia rised with worsening renal function: Stage 1-2, stage 3A, stage 3B, stage 4 and stage 5 CKD were 20%, 44.8%, 46.4%, 81.1%, and 93.8%, respectively (Adera et al., 2019). Several studies show the prevalence of anemia in CKD patients not receiving dialysis up to 60%. Also, at least 90% of dialysis patients will develop anemia (Shaikh et al., 2024). In our study, anemia was more frequent in dialysis patients. Anemia was 80% of dialysis patients and %62 of patients not receiving dialysis with eGFR<30 ml/dk.Cardiac abnormalities are common in dialysis patients like in our study. Regular echocardographic assessment can help the early diagnosis of cardiac abnormalities and reduce cardiac morbidity and mortality.

Limitations and Strengths

There were some limitations in our study. First, the presented study was conducted on a small number of patients. Second, echocardiographic evaluations have been done as a routine with no relation to timing after hemodialysis session. Repeating echocardiography before and after dialysis may be useful in detecting acute dialysis related changes. Third, different types of echocardiographic methods such as speckle tracking imaging may be beneficial for detecting dialysis related changes (Adera et al., 2024).

CONCLUSION

Echocardiography is the simplest and reliable method for evaluating cardiac structures and functions in CKD patients. Left ventricular hypertrophy, tricuspit regurgidation and higher pulmonary artery systolic pressure leves were more common in dialysis patients compared to the patients not receiving dialysis with eGFR<30 ml/dk. These findings not only take attention to the cardiac impacts of dialysis but also highlight the importance of regular cardiac assessment of these patients for early diagnosis and management.

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Conflict of Interest
No conflict of interest has been declared by the author(s).

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Developmental Status of Thoracic Limb Bones of 40-Day-Old Watchdog Hybrid Fetus

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ABSTRACT
Objective: In this study, the developmental status of the thoracic Limb bones of a 40-day-old watchdog hybrid fetus was studied. **Materials and Methods:** Bones of 40-day-old animals were dyed with Inouye technique. Dissections of the bones stored in appropriate solutions were performed. Photographs were taken with a stereomicroscope and a digital camera. Measurements were taken from the dissected legs with a 150 mm Mitutoyo brand caliper. **Results:** It was observed that some of the thoracic limb bones of a 40-day-old watchdog hybrid had a primary ossification center (POC), while some bones did not have a primary and secondary ossification center (SOC). Primary ossification centers were observed in the bodies of the bones of the scapula, humerus, radius, ulna, and ossa metacarpus of the fore limb, but no ossification centers were observed in the proximal and distal ends. Furthermore, ossification centers were not observed in the carpal bones and ossa digitorum manus. **Conclusion:** The formation status and dimensions of POC seen in the bones of the forelimbs of a 40-day-old guard dog hybrid fetus were determined. The ossification centers in guard dog hybrid fetuses were consistent with studies conducted in a large number of domestic animals. As a result, it should mark the ossification in various features such as hormones, environmental factors, and individual variations.
Keywords: Bone, Fetus, Fore Limb, Forty Days Old, Watchdog Hybrid.

40 Günlük Bekçi Köpeği Melezi Ön Ekstremite Gelişme Durumu

ÖZ
Amaç: Bu araştırmada 40 günlük bekçi köpeği melezinin ön extremite gelişim durumu üzerinde çalışılmıştır**. Gereç ve Yöntem:** Inouye tekniğine göre alizarin red ve alcian blue ile 40 günlük hayvanlara ait kemikler boyandı. Uygun solüsyonlarda saklanan kemiklerin diseksiyonları yapıldı. Stereomikroskop ve dijital kamera ile fotoğrafları çekildi. Diseke edilen bacaklardan 150 mm'lik mitutoyo marka kumpas ile ölçümler alındı. **Bulgular:** 40 günlük bekçi köpeği melezinin ön extremite kemiklerinin bazılarında primer ossifikasyon merkezine sahipken bazı kemikler primer ve sekonder ossifikasyon merkezine sahip olmadıkları gözlendi. Ön extremite kemiklerinden scapula, humerus, radius, ulna ve ossa metacarpus'a ait kemiklerin corpus'larında primer ossifikasyon merkezi gözlenirken proximal ve distal uçlarında ossifikasyon merkezi gözlemlenmedi. Ayrıca karpal kemikler ve ossa digitorum manus'ta ossifikasyon merkezlerini gözlemlenmedi. **Sonuç:** Yapılan çalışmada, 40 günlük bir bekçi köpeği melez fetüsünün ön ayaklarının kemik gelişiminde görülen POC (primary ossification center)'un oluşum durumu ve boyutları belirlendi. Bekçi köpeği melez fetüslerindeki kemikleşme merkezleri çoğunlukla evcil hayvanlarda yapılan çalışmalarla uyuşuyordu. Sonuç olarak, beslenme alışkanlıkları, hormonlar, çevresel faktörler ve kişisel farklılıklar gibi çeşitli faktörlerin kemikleşmeyi etkilediğini belirtmek gerekir.
Anahtar Kelimeler: Bekçi Köpeği Melezi, Fetüs, Kemik, Kırk Günlük, Ön Ekstremite.

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INTRODUCTION

Intramembranous ossification happens in extremity bones, while intracartilaginous ossification occurs in cranium bones especially (Govindarajan & Overbeek, 2006; Zhang et al., 2011). Ossification starts in the embryonic period and proceeds throughout postnatal life. POC (Primary ossification center) which form the body of the bone, first appear during gestation, while one or more SOC (Secondary ossification center) appear in the epiphysis of long bones after birth. This cartilage part, which is obligatory for longitudinal bone development, ossified over time and completes the closure of the cartilage in long bones (Getty, 1975). Understanding the normal growth and ossification processes of bones is critical in the diagnosis and therapy of intrauterine anomalies, developmental disorders and genetic bone diseases (Atalgın & Çakır, 2006; Barone, 1986; Dyce et al., 1987; Williams & Dyson, 1989). Various techniques such as single and double staining techniques (DST), radiography, ultrasonography, MRI and different histological dyeing methods are used to evaluate the stages of ossification. DST in particular have been successfully applied in experimental research on bone development in poultry, rabbits, and mammals (Atalgın & Çakır, 2006; Atalgın & Kürtül, 2009; Atalgın et al., 2007; Sevinç et al., 2017). In the study, the DST of alizarin red (AR) and alcian blue (AB), which offers significant advantages in showing the details of ossification centers, was applied. This study was conducted to visualize the ossification centers in the forelimbs of a approximately 40-day-old watchdog hybrid fetuses and to determine the ossification stages.

MATERIALS AND METHODS

In this study, the right forelimbs of four 40-day-watchdog hybrid were examined. Gender is ignored. Their ages were decided using the crown rump length (CRL) measurements recommended in the studies of Evans, Sack and Henry (1973). It was determined that they were about 40 days old and 55-74 mm long. The obtained samples were kept in 15% formaldehyde mixture and washed with water. They were then preserved in containers containing 90% ethanol. The limbs were stained in a final solution containing AB (300 mg AB and 100 ml 70% ethanol) and AR (100 mg AR and 100 ml 95% ethanol) to notice the ossification stages. It was prepared by adding 100 ml of glacial acetic acid and 1700 ml of 70% ethanol to this solution. Limbs were incubated in the mixed dyeing liquid in an oven at 35 °C for four days and then washed under running water for 2 h. After washing, they were stored in a container containing 2% KOH. In addition, the limbs were cleaned with 20% glycerin and 1% KOH and saved in 55% and 85% glycerin solutions for 7 days. Finally, they were stored in a 100% glycerin solution (Atalgın & Çakır, 2006). Findings and images were taken using a stereo microscope (Nikon SMZ 745T). Digital caliper was used to measure the cartilage primitives and ossified parts of the bones. Since dead material was used, no ethics committee approval was obtained.

Ethical considerations

Since the study was conducted on dead material, ethics committee approval is not required.

RESULTS

Scapula

The collum scapula was ossified, indicating the presence of a POC. (Figure 1/2) No SOC was observed at this period (Figure 1).

The cartilage border of the scapula was openly noticed. The body of the scapula appeared its typical similarity as it can be seen in the mature period. Cartilago scapula was present (Figure1/1). It was determined that the ossified part of the scapula was not seen homogeneously, the fossa supraspinata was less mineralized than the total area, and the fossa infraspinata showed more ossification. More ossification was observed especially in the sections where the middle parts of the spina scapula meet the body (Figure 1).

Humerus

The primary ossification center (POC) of the humerus was present, constituting the foundational structure of the bone. The POC appeared as a cylindrical tube with two open ends; however, no secondary ossification center (SOC) was observed at either end (Figure 1).

Regarding the antebrachial skeleton, the POC was noted in the bodies of both the radius (Figure 2/2) and ulna (Figure 2/1). It was determined that the density and elongation of ossification were significantly greater in the radius compared to the ulna. No fusion was detected between the two bone models. Additionally, no SOCs were identified at the proximal or distal ends of either the radius or ulna. Upon examination, it was found that the ossification center of the radius appeared lower when viewed laterally, while the relatively longer ulna had its ossification center positioned higher (Figure 2).

Ossa carpi

Cartilage outline was formed in all carpal bones. However, no POC or SOC was observed in any carpal bone (Figure 2).

Ossa metacarpi

A POC (Figure 2/3) was observed in each of metacarpale II, III, IV. It was determined that those in metacarpale III and IV were larger. It was determined that there was no fusion between the bones (Figure 2).

Phalanx

A cartilaginous outline was formed in each of the phalanxes. However, no POC or SOC was observed in any of them (Figure 2).

Total and ossification centre right lengths of bones are shown in table 1.

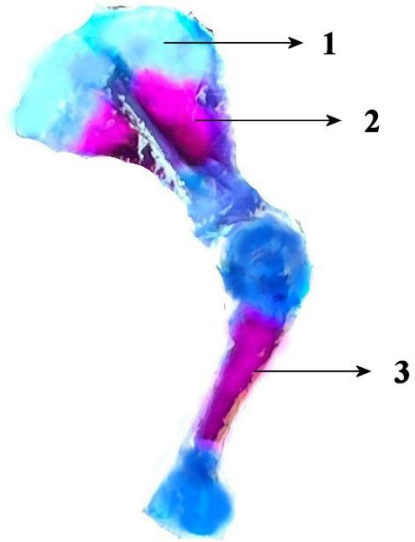

Figure 1. Scapula and Humerus of a 40-day-old watchdog hybrid fetus, 1. Cartilago scapula, 2. POC of scapula, 3. POC of humerus.

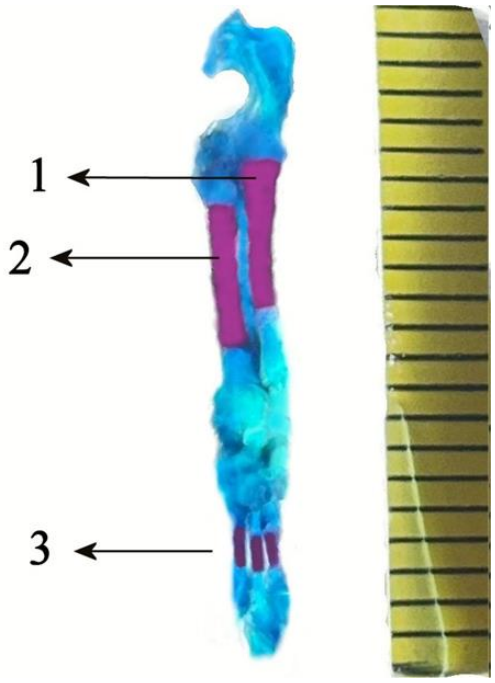

Figure 2. Skeleton antebrachii and ossa metacarpea of a 40-day-old watchdog hybrid fetus, 1. POC of ulna, 2. POC of radius, 3. POC of ossa metacarpea.

Table 1. Total and ossification center right lengths of bones.

Bone (mm)	n	Total Length (average)	POC Length (average)
Scapula	4	9	4.8
Humerus	4	13	4.9
Radius	4	9.5	5
Ulna	4	12	4.5
Metacarpus (average)	4	1.3	0.9

DISCUSSION

It is stated that ossification of the scapula in mammals is provided by one POC and two SOC, while in humans, the scapula ossifies from 8 secondary ossification centers (Barone, 1986). According to Getty (1975), the scapula ossifies from four centers in equidae and three centers in ruminantia. Patton and Kaufman (1995) reported that the scapula ossifies from one primary center and one secondary center in mice. Hare (1961) and Chapman (1965) reported that the scapula in dogs has a total of two ossification centers located in the collum scapula and tuber scapula. In our study, a single center was observed in the corpus in 40-day-old fetuses, and these data are generally consistent with our study. It has been reported that the SOC of the radius in dogs begins to ossify on postnatal days 10-25 (Champman, 1965; Hare, 1961). No SOC was observed in 40-day-old fetuses, and our data are suitable for this study.

It has been stated that the ulna has three ossification centers in mammals, one of which is in the corpus, the other two are in the olecranon and the proc. styloideus (Doğuer & Erençin, 1962). The existence of one POC and two SOC has been reported in the literature (Barone, 1986; Chapman, 1965; Getty, 1975; Hare, 1961; Olgun, 1978). It is said that these two secondary ossification centers begin to ossify on the 40th-45th day in dogs (Chapman, 1965; Hare, 1961) and on the 48th-54th day in the Angora cat (Olgun, 1978). It was determined that the SOC of the ulnas of the 5-6 month-old materials fused with the corpus at both ends. In the 7-month-old material, it was determined that the epiphyseal plates were closed. These bones are found as two separate bones in adult dogs (Chapman, 1965; Hare, 1961). In our study, the fact that the ossification centers of the two bones were not at the same level can be considered as a precaution taken to ensure the strength of the antebrachium. No secondary ossification centers were seen in the 40-day-old fetuses in our study and no evaluation could be made for these dates. Lopez et al (1993) stated that the ossa carpi in Siamese cats was not ossified in newborns. It was reported that the ossa carpi began to ossify between postnatal days 18-45 in dogs (Champman, 1965; Hare, 1961).

No secondary ossification centers were seen in the 40-day-old fetuses in our study.

It was observed that primary centers were formed in the scapula and humerus, but secondary centers were not formed. It was observed that the primary ossification center was formed in the radius and ulna, and this primary center was longer in the radius. However, it was determined that the secondary ossification center had not yet formed in both bones.

In each of the ossa metacarpale II, III, IV bones, a primary ossification center was observed, while those in ossa metacarpale III and IV were larger. It was observed that the cartilaginous bone primitive was formed in all carpal bones, but the primary or secondary center had not yet formed. It was observed that the cartilaginous bone primitive was formed in the phalanxes, but the primary or secondary center had not yet formed.

CONCLUSION

In this study, the formation status and sizes of the POC seen in the bone development of the forelimb of a 40-day-old watchdog hybrid fetus were determined. The ossification centers in the watchdog hybrid fetuses mostly matched the studies conducted on domestic animals. In conclusion, it should be noted that there are various factors that affect ossification, such as nutritional habits, hormones, environmental factors, and individual differences.

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Conflict of Interest

The author declares no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Author Contributions

Plan, design: ŞHA, MK, SY; **Material, methods and data collection:** ŞHA, MK, SY; **Data analysis and comments:** ŞHA, MK; **Writing and corrections:** ŞHA, MK, SY.

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Ethical Approval

Since the study was conducted on dead material, ethics committee approval is not required

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Attitudes and Care Experiences of Nurses and Midwives Towards Obese Pregnant Women: A Qualitative Study

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ABSTRACT

Objective: The aim of this study is to examine and explain the attitudes and care experiences of nurses/midwives towards obese pregnant women in detail. **Materials and Methods:** This is a qualitative study that uses a phenomenological approach. The study included 30 nurses and midwives who were involved in the care of obese pregnant women. The research data were collected with the descriptive data form and semi-structured questionnaire by the researchers through face-to-face interviews. The data were analyzed using the theoretical thematic analysis technique. **Results:** Four main themes emerged from the data as experience, reaction, prejudice, and stigmatization. According to the results of the study, most of the midwives/nurses stated that they had negative care experiences with obese pregnant women. Many nurses and midwives stated that obese pregnant women have a high risk of complications, have difficulty in their care, and increase the workload. In addition, participants described obese pregnant women with expressions such as sick individual, immobile, gets tired quickly, and cannot breastfeed. **Conclusion:** In general, according to these results, it was determined that nurses/midwives mostly had negative care experiences towards obese pregnant women, were prejudiced against obese pregnant women and stigmatized them.

Keywords: Obesity, Pregnancy, Attitudes, Caring.

Hemşire ve Ebelerin Obez Gebelere Yönelik Tutumları ve Bakım Deneyimleri: Nitel Bir Çalışma

ÖZ

Amaç: Bu çalışmanın amacı, hemşire/ebelerin obez gebelere yönelik tutumlarını ve bakım deneyimlerini ayrıntılı olarak incelemek ve açıklamaktır. **Gereç ve Yöntem:** Bu çalışma fenomenolojik yaklaşımın kullanıldığı nitel bir çalışmadır. Çalışmaya obez gebelerin bakımında yer alan 30 hemşire ve ebe dahil edilmiştir. Araştırma verileri, tanımlayıcı veri formu ve yarı yapılandırılmış soru formu ile araştırmacılar tarafından yüz yüze görüşme yoluyla toplanmıştır. Veriler teorik tematik analiz tekniği kullanılarak analiz edilmiştir. **Bulgular:** Verilerden deneyim, tepki, önyargı ve damgalama olmak üzere dört ana tema belirlenmiştir. Araştırma sonuçlarına göre, hemşire/ebelerin çoğu obez gebelerle yönelik olumsuz bakım deneyimleri olduğunu belirtmiştir. Birçok hemşire ve ebe, obez gebelerin komplikasyon riskinin yüksek olduğunu, bakımlarında zorluk yaşadıklarını ve iş yükünü artırdıklarını belirtmiştir. Ayrıca katılımcılar obez gebeleri; hasta birey, hareketsiz, çabuk yorulan, emziremeyen gibi ifadelerle tanımlamışlardır**. Sonuç:** Genel olarak bu sonuçlara göre hemşire/ebelerin obez gebelere yönelik çoğunlukla olumsuz bakım deneyimlerinin olduğu, obez gebelere karşı önyargılı oldukları ve onları damgaladıkları belirlenmiştir.

Anahtar Kelimeler: Obezite, Gebe, Tutumlar, Bakım.

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INTRODUCTION

Obesity, which has an increasing prevalence and incidence worldwide, is a serious health problem due to the diseases and death it causes. Similarly, the prevalence of obesity in Turkey has exceeded the "critical high rate" of 30% in the adult population. This increase is worrying, since obese women experience complications and difficulties during pregnancy and childbirth that lead to poor outcomes (Kerrigan et al., 2015).

Maternal obesity is associated with obstetric risks and neonatal outcomes such as pre-eclampsia/eclampsia, thrombosis, abortion, stillbirth, cesarean section risk and meconium staining. The rate of fetal malformations increases as the rate of obesity in pregnancy increases. In addition, obese women have a higher risk of gestational diabetes and a macrosomic baby (Paredes et al., 2021). In addition, obese pregnant women have more difficulties with breastfeeding in the postpartum period. The reasons for this include delayed onset of lactogenesis II, which is associated with inadequate milk production, a metabolic profile that predisposes to the risk of insulin resistance, and psychosocial factors. Obese women state that they feel uncomfortable during breastfeeding in public and express body image concerns as a barrier for breastfeeding (Du et al., 2019).

Obese pregnant women experience difficulties and risks in antenatal, intrapartum and postnatal care and during interactions with health care professionals. The knowledge of nurses and midwives about obesity-related medical complications raises concerns about possible risks. Obesity causes difficulties in the care of obese pregnant women in the field of health due to the high risk of complications, difficulties experienced during positioning or mobilization of the pregnant woman, difficulty in performing Leopold maneuvers, difficult monitoring of the fetus, and insufficient materials to be used in treatment and care (Paredes et al., 2021; Ellis et al., 2019). Obese pregnant women may be exposed to negative attitudes and behaviors of midwives/nurses, although this is not an acceptable behavior in the health system. Negative prejudice and stigmatization experienced by obese pregnant women is one of the most important problems in professional health care settings (Okuyucu et al., 2019).

The nature and quality of communication between nurses and midwives and obese pregnant women is an issue that needs to be investigated considering the increasing prevalence of obesity in pregnancy, the impact on maternal and infant mortality and morbidity rates, and the frequency of interaction of pregnant women with the health care system.

As a result, while the clinical risks associated with maternal obesity are well documented, there is limited research focusing on the attitudes and experiences of the nurses and midwives who provide direct care to these women.

Nurses and midwives are key figures in maternal care, and their perceptions and experiences can significantly influence the quality of care provided. However, caring for obese pregnant women presents unique challenges in antenatal, intrapartum, and postnatal settings, from difficulties with physical care, such as positioning or fetal monitoring, to navigating the stigma that obese women often face in healthcare environments. Given the complex nature of these interactions, negative attitudes or biases from healthcare professionals can further exacerbate the challenges faced by obese pregnant women, potentially impacting their overall health outcomes.

This study aims to explore the attitudes and care experiences of nurses and midwives toward obese pregnant women, with a focus on understanding how these healthcare professionals navigate the clinical and emotional challenges involved. By examining their perspectives, this study seeks to identify areas where support and training may be needed to improve the quality of care for obese pregnant women. The findings could provide valuable insights for healthcare policymakers and educators, helping to foster a more compassionate, informed, and effective approach to maternal care for this vulnerable population.

MATERIALS AND METHODS

Study type

This study was conducted between 01.03.2022 and 18.09.2022 as qualitative research using a phenomenological approach to examine the attitudes and care experiences of nurses/ midwives in antenatal/innatal and postnatal care of obese pregnant women in detail.

Study group

The universe of the study consisted of nurses and midwives working in the care of pregnant women followed up in university and training research hospitals located at 3 different major cities of Turkey. The study sample consisted of 30 nurses and midwives (nurses: 13, midwives: 17) who met the research criteria and volunteered to participate in the study. Nurses and midwives were included among the health professionals in this study because they provide direct care before, during and after childbirth, have long-term contact with pregnant women, play an important role in education and counseling, and play an important role in risk management. Purposive sampling method was used as the sampling method. Inclusion criteria were determined as follows; being able to communicate in Turkish, working in antenatal outpatient clinic, delivery room, perinatology service and postpartum service, having obese pregnancy caring experience and volunteering to participate in the study.

Procedures

The research data were collected with the Descriptive Data Form and Semi-structured Questionnaire

developed by the researchers in line with the literature. Data were collected through face-to-face interviews in a quiet and suitable room for approximately 30 - 45 minutes. Voice records were made during the interviews. The obtained recordings were transcribed (Microsoft Office Word) without changing the statements of the participants. Data collection was terminated when the data obtained from the sample reached saturation and started to repeat itself.

Descriptive Information Form: It is a form designed to determine the sociodemographic and anthropometric characteristics of the participants. It consists of a total of 6 questions that question the sociodemographic information of nurses and midwives such as their profession, age, gender, and their own body perception.

Semi-structured Questionnaire: It was prepared to evaluate the attitudes, thoughts and opinions of nurses and midwives towards obese pregnancy care. The questions in this section were prepared in line with the literature (Phelan et al., 2015; Wennberg et al., 2014; Yilmaz & Ayhan, 2019). The research questions are as follows; "Can you tell me the words that come to your mind when you hear the term "obese pregnant woman", How would you evaluate your attitudes and behaviors towards obese pregnant women, can you explain your experiences in caring for obese pregnant women?". Expert opinion was obtained for the research questions.

Statistical analysis

The numerical data obtained from the descriptive information form were analyzed in EXCEL. The data were analyzed using the theoretical thematic analysis technique commonly used in qualitative research. The data obtained were handled in 6 stages (Braun & Clarke, 2006):

1.Familiarity with the data was established.

2.Data items in all documents were coded. For example, women's statements such as "...fat.", "...sick individual." were coded as negative expressions; statements such as "...the shift will not end tonight", "...we will try, she cannot breastfeed." were coded as negative experiences and negative thoughts.

3.Related codes were brought together, and potential themes were created. For example, codes such as negative statements, negative thoughts and negative experiences were thematized as prejudice.

4.Themes covering similar situations were combined.

5.The comprehensibility of the generated themes was evaluated. Statistics of document-based sub-codes, statistics of code-based sub-codes and code mapping were performed in MAXQDA software.

6.In the final stage, the researchers interpreted the perceptions of the participants about the subject through the generated themes. The findings were reported by evaluating whether the selected vivid and striking quotes met the relevant situation.

Data trustworthiness: To ensure data trustworthiness, the authors underwent training in qualitative data analysis, enhancing their skills and understanding of the methodologies involved. In this study, researcher triangulation was implemented by involving three researchers in the data collection, analysis, and interpretation stages. This approach helped to minimize bias and ensure a more comprehensive understanding of the data. Additionally, expert opinions were sought throughout the research process to provide external validation and further strengthen the credibility of the findings.

Ethical considerations

Ethical approval was obtained from the Nigde Omer Halisdemir University Ethical Review Board (No:2022/02-10) on 23 February 2022. The study was conducted in accordance with the Principles of the Declaration of Helsinki and an Informed Consent Form was completed for each nurse and midwife involved in the study.

RESULTS

A total of 30 people participated in the study, 13 of whom were nurses and 17 midwives. The mean age of the participants was 33.70 ± 6.51 (minimum: 23 - maximum: 45) and the mean body mass index was 23.10 ± 2.22 (minimum: 20.24 - maximum: 27.34). All nurses and midwives who participated in the study had at least a bachelor's degree and only 3 nurses had a master's degree. Only 1 of the participants was a male nurse. The average length of employment was reported as 12.20 ± 8.40 years (minimum: 1 - maximum: 25).

After thematic analysis, the statements were combined under 4 main themes: experience, reaction, prejudice, and stigmatization (Figure 1). The main theme of experience consists of the difficulties, complications, and care-related experiences of nurses/ midwives in the care of obese women. Reactions reflect the attitudes of nurses and midwives in caring for obese women. While the thoughts of nurses/ midwives about the appearance and temperament of obese women constitute the theme of prejudice; the behaviors they reflect as the output of these thoughts constitute the theme of stigmatization. Themes and sub-themes are presented in Table 1.

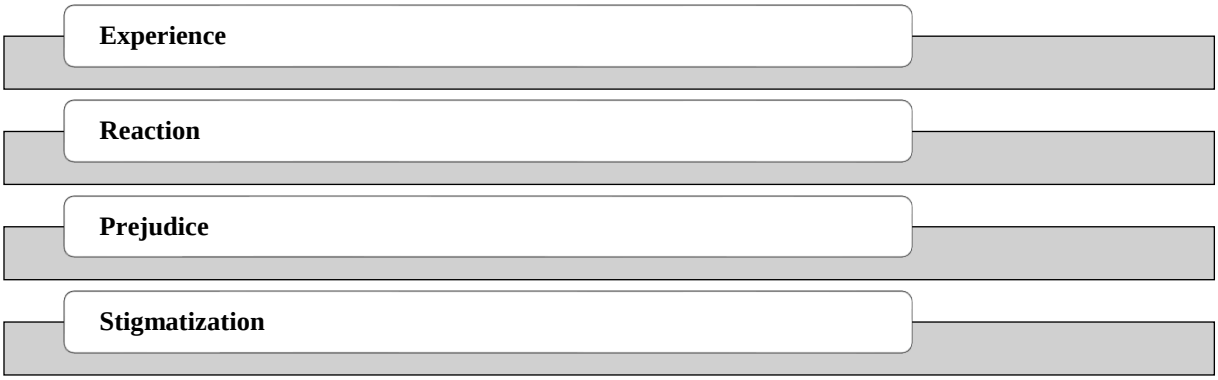

Figure 1. Findings on themes.

Table 1. Findings on themes, sub-themes and code frequencies.

Main theme	Sub-theme	Code frequency (CF)
Experience	Risk of complications	84
	Difficulty in care and treatment	48
	Increased workload	32
	Difficulty in examination and diagnosis	16
	Intervention during delivery	16
	Cost increase	4
	Inadequate involvement of women in care	4
	Difficulty in baby care	2
Reaction	Difficulty in care	41
	Prefer not to care	9
	Feeling upset	8
	Being afraid	8
	Being worried	4
Prejudice	Sick individual	40
	Have an unhealthy diet	23
	Compatible	6
	Cute	2
	Big breasts	2
	Like a ball	2
	Feisty	1
	Ugly	1
	Seal fish	1
	Red face	1
	Inverted nipple	1
Stigmatization	Inactive	24
	Gets tired easily	22
	Cannot breastfeed	18
	Smells like sweat	8
	Does not follow instructions	3
	Inadequate self-care	6
	Ignorant	3
	Insensitive	3
	Negligent	2
	Big, large, huge	2

Theme 1: Experience

The risk of developing complications under the main theme of experience was identified as the most frequently mentioned sub-theme in code frequency (84). Nurses and midwives stated that maternal-fetal risks such as prolapse, infection, deep vein thrombosis, respiratory distress, cardiovascular problems, dehiscence, atony, decreased urine output, delayed healing at the wound site, macrosomia, especially risky pregnancy are more common in obese pregnant women. In addition, nurses and midwives stated that obese women are more likely to develop birth complications such as head-pelvis mismatch during childbirth.

“Wound site infection is frequent, the belly covers the wound, the area sweats and the wound does not breathe... then the woman needs to be hospitalized …” (Midwife, A.T.)

“The baby was stuck, because the head was big...right at the exit...the baby had a problem with the arm but the birth still occurred” (Midwife, D...)

“I have 22 years of experience now. When I see an obese pregnant woman, I know that she will have a more difficult delivery, that the progress of delivery will be more difficult” (Midwife, T.…)

In addition, almost all nurses and midwives stated that obese pregnancy alone increased the likelihood of cesarean delivery.

"Obese pregnant women have an increased risk of cesarean section. Unfortunately, there are also anesthetic risks associated with cesarean delivery in these women." (Nurse, C.…). "Delivery usually does not progress in obese pregnant women and cesarean section is required" (Nurse, D...).

The code frequency of difficulty in care and treatment under the main theme of experience was determined as 48. Nurses and midwives stated that they had difficulties in issues such as mobilization, invasive interventions, Foley catheter insertion, uterine massage and breastfeeding. Midwife O. described the difficulty she experienced as follows. “They are not as short as us (obese pregnant women)! For example, she fills the bed... so again, it requires strength, it requires power, I often put a step under me to reach her…”

It was determined that the difficulties experienced by nurses and midwives in care and treatment were frequently used together with the sub-theme of examination and evaluation. Nurses and midwives expressed that they had difficulties during NST, vaginal probing, blood pressure measurement and hearing the child's heartbeat.

“I worry about how to find the NST and the intravenous line... sometimes the foley catheter comes out by itself” (Midwife, A.T.).

“It is very difficult to hear the fetal heartbeat if the gestation is less than 34 weeks … the layer of fat on top is very thick... When I listen with the fetoscope, I lift the belly up because there is sagging, it becomes more difficult when there is edema”. (Midwife, D.)

“We'll turn her over (obese pregnant woman), change the diaper. We turn her, we place her on the bed... We can't turn her, and we can't lift her. We are having difficulty”. (Midwife, D.R.)

“We already apply a force even in normal pregnant women while touching, but it is extra difficult to reach the cervix in them (obese women) ... We even take them to the table, and we have to touch them on the table.” (Midwife, H.T.).

Nurses and midwives stated that obese women also experience difficulties in caring for their babies in the postpartum period due to complications. “She can't look at her baby because the aches and pains are too much...-she says take him/her away-.... So, she doesn't want to see her baby” (Midwife, T.) In addition, it was also stated that obese women participate inadequately in their self-care due to mobility limitations. "A woman needs to be active during delivery. ... but she can't; she has limited exercise, walking - even walking is a problem - she doesn't do anything". (Midwife, N.).

“Difficult and prolonged delivery is observed as the pregnant woman may have difficulty in pushing.” (Nurse, S.)

Nurses and midwives had to perform extra interventions such as Kristellers maneuver, episiotomy, use of retractors for obese pregnant women during delivery on the delivery table instead of the bed, which decreased the comfort of the woman.

“For example, we normally deliver the baby in the patient's own bed, but I take these women to the delivery table. They can't spread their legs, it's difficult. So, I feel the need to take them to the delivery table” (Midwife, T.)

“They push insufficiently, and we have to push even if we don't want to (Kristeller manoeuvre)” (Midwife, D.)

It was concluded from the statements of nurses and midwives that obesity increases the cost of care and especially the workload. Nurses and midwives stated that more medicines and consumables are used despite the risk of complications and that extra staff are needed to care for obese pregnant women. In addition, nurses and midwives stated that they worked with inappropriate consumables and medical equipment in the treatment and care of obese pregnant women, such as using two NST cables, inadequate blood pressure cuffs, and the woman not fitting on the stretcher/table.

“You can't lift the pregnant woman, and they take more strength from us (physical support) ... they force us ... we call other friends...”. (Midwife, A.T.)

“Instead of 4 ampules of oxytocin, we're administering 6 ampules, so she doesn't bleed. We're putting in supplemental fluid. We're administering Cyctotec. (Midwife, D.)

Theme 2: Reaction

Variables such as the avoidance of nurses and midwives from caring of obese pregnant women, having more difficulty in caring for obese pregnant women compared to women with normal weight, feeling sorry for obese pregnant women, being afraid and worried about the risks and complications that may occur were categorized under the main theme of reactions. Since the sub-themes under the theme of reactions consisted of intertwined codes, the statements of nurses and midwives were presented without separation.

"So I'm thinking, whether this woman was obese all the time or this happened during pregnancy. Pity... she was accepting this situation... If she had given birth normally, what would I have faced then?" (Midwife, T).

"I think this woman (obese pregnant) will be a challenge for me" (Midwife, A.T.)

"I say no! I think about how she will give birth, how she will have a hard time giving birth. Of course, I wish we hadn't come across each other....." (Midwife, D.R.)

"Obesity in pregnant women worries me. I find it dangerous for the continuation of the pregnancy and the life of the pregnant woman or the baby." (Nurse, D.K.)

"They have no difficulties for me. I feel sorry for them because they are young." (Midwife, H.T.)

"Limitation of movement in obese women is another problem that we encounter. For example, problems such as the woman having difficulty getting on the delivery table, not being able to take the appropriate position when she has contractions... It is also very difficult to monitor or connect the pregnant woman to the NST during this period". (Nurse, D.K.)

Theme 3: Prejudice

The prejudices of nurses and midwives towards obese pregnant women were divided into sub-themes such as cute, ugly, red face, compliant, touchy, sick individual, having an unhealthy diet, large breasts, and inverted nipple. Since the sub-themes under this theme consisted of intertwined codes, the statements of nurses and midwives were presented without separation.

"People with high blood pressure. People who like to eat... really like to eat, they eat without realizing it" (Nurse, D).

"They are like a ball or a seal" (Midwife, D.R.)

"She had very big breasts. Maybe the biggest tits I've ever seen. Her breasts were the size of a baby." (Midwife, H.L.)

Theme 4: Stigmatization

There were statements indicating that nurses and midwives intensely stigmatized obese pregnant women. The statements of nurses and midwives related to the sub-themes under the stigmatization theme were presented together.

"However, it is important not only to stand but also to do sports... they do not know this... they are ignorant." (Midwife, D.R.)

"Although they take care about their body hygiene, they often smell of sweat (Nurse, M)

"They get tired quickly and have limited involvement in care, even if they are willing (Nurse, C.)

It has been determined that the negative experiences and difficulties experienced by nurses and midwives support stigmatization. The statements of Nurse O. are as follows; "She's already physically bigger, larger, huge than me... and when these difficulties are added to that... It makes me even more tired…"

It was determined that nurses and midwives have a serious stigmatization about obese women not being able to breastfeed their babies. The reasons for not being able to breastfeed were reported as obese women's large breasts, inverted nipples, fatigue, inactivity and more pain due to complications.

"They are already incapable of breastfeeding. They usually have inverted nipples…" (Midwife, G.)

"They get tired quickly and are therefore reluctant to breastfeed" (Midwife, D.)

The code map in Figure 2 shows the themes that were frequently used together. In the code map, the lines between the themes and sub-themes that were frequently used together are thick, and the lines between the themes and sub-themes that were relatively infrequently used together are thin.

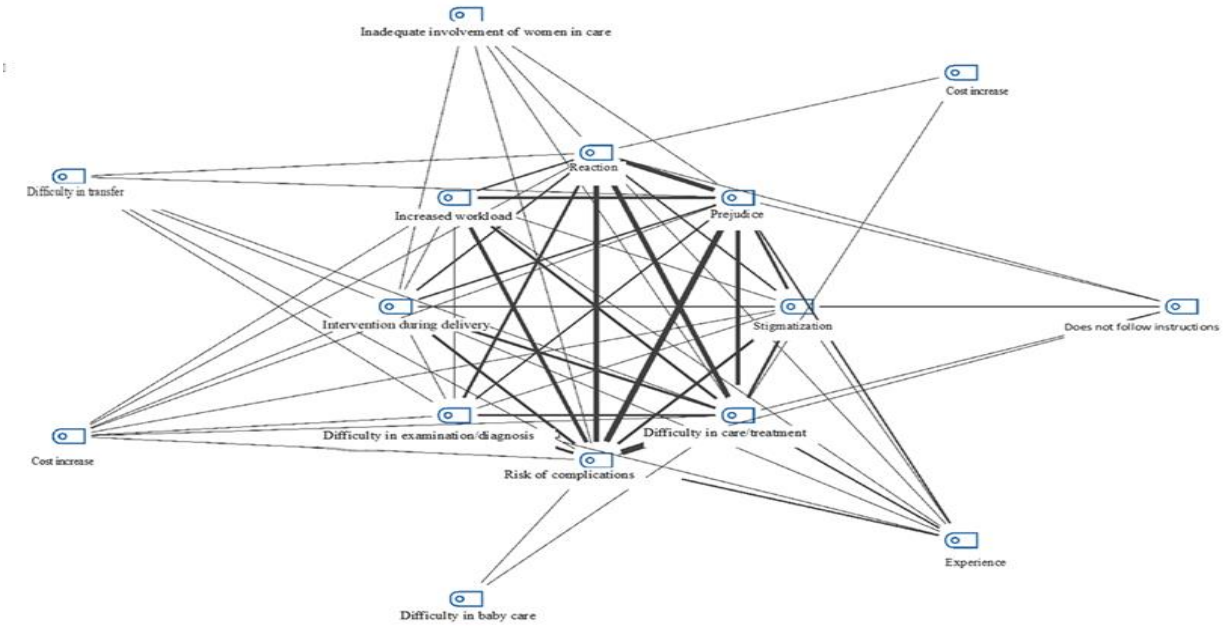

Figure 2. Themes that were commonly used together: code map

DISCUSSION

The study investigated the attitudes and care experiences of nurses/ midwives during interaction with obese pregnant women. Four main themes have emerged from the data analyses: "experience", "reaction", "prejudice" and "stigmatization". There are more studies in the literature that have investigated obesity in the non-pregnant population. Obese individuals are subjected to prejudice and discrimination in all segments of society, including family, work, education, and health in every period of their life. The concept of obese women is a complex concept influenced by biological, sociocultural, and social dynamics (Wennberg et al., 2014; Yilmaz & Yabancı, 2019; Braun & Clarke, 2006; Knight-Agarwal et al., 2016). Management of obese women's pregnancy, delivery and postpartum care can be challenging for both the health care resources of hospitals and the health care team. Obesity during pregnancy increases the risk of mortality and morbidity for both mother and fetus. Moreover, additional equipment and health personnel may be needed to provide appropriate perinatal care to obese women. In this study, nurses and midwives frequently stated that the risk of maternal and fetal complications was high in obese pregnant women (code frequency: 84) (Figure 2). In addition, they stated that obese pregnant women increase their workload, care and treatment are more difficult and the equipment is not suitable for them compared to normal pregnant women. Nurses and midwives also mentioned some examination and diagnosis difficulties for obese pregnant women. These challenges include vaginal touch, monitoring, Foley catheter insertion, uterine massage, NST, blood pressure measurement, and hearing fetal heart sounds. According to the code map of the study, it was determined that nurses and midwives frequently used the themes such as the risk of developing complications, difficulty in care and treatment, and increase in workload together. It was also found that the themes of reaction (difficulty in care, fear, anxiety, etc.), stigmatization (inactive, gets tired easily, etc.) and prejudice (sick individual, having an unhealthy diet, etc.) were frequently used together with the theme of negative experiences. The results of the study are in parallel with the studies in the literature (Bjørsmo et al., 2022; Charnley et al., 2017). In addition, nurses and midwives stated in this study that they often had difficulty in the caregiver role (code frequency: 41) (Figure 2). When the code map of the study was examined, it was determined that the expression "I have difficulty in providing care" was frequently used together with negative experiences such as "difficulty in examination and evaluation", "high risk of complications", and "intervention during delivery". This result supports the results of recent studies conducted in Turkey and the UK (Okuyucu et al., 2019; Aksoy et al., 2022).

It is known that obese pregnant women have a higher incidence of many intrapartum risks such as instrumental vaginal delivery, cesarean delivery and fetal birth trauma11,12. The literature highlights the medical and professional challenges of labor management in the presence of obesity (Kerrigan et al., 2015; Okuyucu et al., 2019; Yilmaz & Yabancı, 2019; Aksoy et al., 2022). In the study, almost all of the nurses and midwives frequently emphasized that obese pregnancy increases the likelihood of cesarean

delivery alone and that the risk of interventional delivery is high in obese pregnant women (code frequency: 16) (Figure 2). The results of the study support the literature.

Obese pregnant women experience additional challenges and risks during the pregnancy follow-up and interactions with health care professionals. In the field of health, obese pregnant women experience problems and may be exposed to negative attitudes and behaviors of health professionals due to reasons such as difficult care of obese pregnant women in the field of health, high risk of complications, more difficult positioning and movement, and insufficient equipment to be used in the treatment and care of obese women (Bjørsmo et al., 2022; Charnley et al., 2017; Christenson et al., 2020; Dieterich & Demirci, 2020). The negative attitude of health personnel documents that prejudice against obesity also exists in the field (Charnley et al., 2017; Dieterich & Demirci, 2020; Tomiyama et al., 2018). In the literature, the most commonly reported care difficulties for obese pregnant women include mobility limitation of the pregnant woman. In this study, participants stated that obese women were most sedentary during the labor. In addition, it was determined that obese pregnant women were most frequently defined as " patients" (code frequency: 40) (Figure 2) by nurses and midwives due to possible health risks. In the study, it was observed from the statements of nurses and midwives that they had negative prejudices and stigmatization towards obese pregnant women arising from their previous experiences. Statements such as "They are already incompetent in breastfeeding"; "They usually have inverted nipples..." clearly indicate the experience and prejudice of nurses and midwives. It was determined that nurses and midwives have a serious stigmatization about obese women not being able to breastfeed their babies. The results of the study support the literature (Garner et al., 2014; Yan et al., 2014; Grube et al., 2016).

CONCLUSION

The increasing prevalence of obesity worldwide also affects the pregnancy period. Obesity during pregnancy brings many maternal and fetal risks. This study is important in terms of revealing the attitude, behavior, difficulties, reaction, prejudice and stigmatization of nurses and midwives, who are at a key point in terms of maternal and newborn health, while interacting with obese pregnant women.

Nurses and midwives participating in the study frequently stated that care and examination of obese pregnant women is difficult. They also stated that these pregnant women have a high risk of developing complications during delivery and are generally prone to intervened delivery, especially cesarean section. As a result, they also stated that employee workload and care costs have increased. They also frequently emphasized the lack of resources and equipment while providing care for obese pregnant women. Based on their previous experiences, the participants interpreted obese pregnant women as individuals who were often sick, sedentary, had difficulty in breastfeeding, had difficulty participating in the care of their newborn baby, had unhealthy diet, and got tired easily or smelled sweaty. As a result of the study, it can be said that nurses and midwives generally exhibit negative attitudes during interaction with obese pregnant women, and that there is prejudice and stigmatization about obesity in the participants. Our findings provide a sufficient basis for further research by revealing the factors contributing to stigmatizing attitudes and behaviors of nurses and midwives working with obese pregnant women.

The findings of this study have significant implications for the healthcare field, particularly in the management and care of obese pregnant women. By highlighting the negative attitudes, prejudices, and stigmatization displayed by nurses and midwives, the results underscore the need for targeted interventions and training programs aimed at improving healthcare providers' perceptions and behaviors towards obese patients. Addressing these biases is crucial not only for enhancing the quality of care provided to obese pregnant women but also for ensuring more equitable and compassionate healthcare practices. Additionally, the study points to the need for better resources and equipment tailored to the care of obese patients, which could help reduce the workload on healthcare professionals and improve overall patient outcomes. These insights provide a strong foundation for further research to explore effective strategies for reducing stigma and improving the healthcare experience for obese pregnant women, ultimately contributing to better maternal and fetal health outcomes.

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Conflict of Interest

The author declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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Assessment of Occupational Hazards Faded by Healthcare Workers Using Multi-Criteria Decision-Making Methods

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ABSTRACT
Objective: This study aims to assess the impact of risk factors that healthcare workers are exposed to in their workplaces on occupational health and safety. **Materials and Methods:** Considering the importance of healthcare workers for society and humanity, the risks they face at work have been evaluated using Multi-Criteria Decision-Making (MCDM) methods, specifically the Entropy and AHP methods. The Entropy method is an objective evaluation method used to determine the importance levels of each criterion in MCDM methods. The AHP method involves both objective and subjective decisions to select the best option among multiple alternatives. The criteria and sub-criteria used in the study were prepared based on the opinions and suggestions of field experts and a literature review. Microsoft Excel was used for the analysis. **Results:** According to the analysis results of the AHP method, the criterion with the highest weight was psychological risks (C-5) with a value of 0.351542. The criterion with the lowest weight was physical risks (C-3) with a value of 0.1121. In contrast, the analysis results of the Entropy method indicated that the criterion with the highest wj value was physical risks (C-3) with a value of 0.273, while the criterion with the lowest weight was biological risks (C-1) with a value of 0.152. **Conclusion:** The most significant risk factors for healthcare workers in workplaces, as identified by the AHP method, were psychological risks, while the Entropy method identified physical risks as the most significant.
Keywords: AHP Method, Entropy Method, Health Sector, Occupational Health and Safety.

Sağlık Çalışanlarının İş Yerlerinde Maruz Kaldıkları Risklerin Çok Kriterli Karar Verme Yöntemleri ile Değerlendirilmesi

ÖZ
Amaç: Bu çalışma, sağlık çalışanlarının iş yerlerinde maruz kaldıkları risk unsurlarının iş sağlığına ve güvenliğine olan etkisini değerlendirmek amacıyla yapılmıştır. **Gereç ve Yöntem**: Sağlık çalışanlarının toplum ve insanlık için öneminden yola çıkılarak işyerinde maruz kaldıkları riskler Çok Kriterli Karar Verme (ÇKKV) yöntemlerinden Entropi ve AHP yöntemleri ile değerlendirilmiştir. Entropi yöntemi, ÇKKV yöntemlerinde her bir kriterin önem düzeylerinin belirlendiği objektif bir değerlendirme yöntemidir. AHP yöntemi, birden çok alternatif arasından en iyisini seçmek için kullanılan nesnel ve öznel kararları içeren bir yöntemdir. Çalışmada kullanılan ölçüt ve alt ölçütler, alanında uzman kişilerin görüş ve önerileri ile literatür taraması dikkate alınarak hazırlanmıştır. Analizlerin çözümünde Microsoft Excel kullanılmıştır. **Bulgular:** AHP yönteminin analiz sonucuna göre en yüksek ağırlığa sahip kriter, 0,351542 değeri ile C-5 psikolojik riskler olmuştur. En düşük ağırlığa sahip kriter 0,1121 değeri ile C-3 fiziksel risk kriteri olmuştur. Entropi yönteminin analiz sonucuna göre wj değeri en yüksek olan kriter 0,273 değeri ile C-3 fiziksel riskler olmuştur. En düşük ağırlığa sahip kriter ise 0,152 değeri C-1 ile biyolojik riskler olmuştur. **Sonuç:** İş yerlerinde sağlık çalışanları için en önemli risk unsurları (AHP yöntemi) psikolojik riskler ve (Entropy yöntemi) fiziksel riskler olmuştur.
Anahtar Kelimeler: AHP Metodu, Entropi Metodu, Sağlık Sektörü, İş Sağlığı ve Güvenliği.

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INTRODUCTION

The main purpose of those working in the health sector is to provide quality health services to the society. However, most of the time, health workers, as in other sectors, may be exposed to various occupational risks and work accidents while performing this service (Meydanlioglu, 2013). Covering protection, rehabilitation and treatment services, this service class addresses a wide range of work areas. The health sector has been evaluated within the scope of dangerous and very dangerous class according to the Workplace Hazard Classes Communiqué on Occupational Health and Safety. Providing a safe, high quality and effective health service can only be achieved by giving sufficient importance to and improving the working conditions, working environments and work safety of health workers. Some regulations have been made in this field at the national and international level. For example, the details regarding occupational health and safety, which were previously included in the Labor Law No. 4856, have been included in the Occupational Health and Safety Law No. 6331 and its scope has been expanded. Accordingly, all provisions employed in public or private workplaces based on their status, including 657 civil servants, are included for the first time, all public institutions and organizations/workplaces, unlike the previous laws. This regulation also imposes some duties and responsibilities on the employer and employee (Gurer & Gemlik, 2020; Law on Occupational Health and Safety, 2012; Workplace Hazard Class Notification on Occupational Health and Safety, 2012). Joint Commission International (JCI) has not only addressed patient safety but also highlighted issues related to employee safety, ensuring the occupational safety of healthcare workers through various initiatives (Workplace Hazard Class Notification on Occupational Health and Safety, 2011). In the health sector, there are various risks such as physical, ergonomic, biological, chemical, and psychosocial. The negative effects of these risks include diseases such as hepatitis C, tuberculosis, hepatitis B and AIDS. Radiation, penetrating-cutting materials, anesthetic gases, carcinogenic agents, etc. factors can cause serious inconveniences to employees. Musculoskeletal disorders may occur due to non-ergonomic working conditions. Finally, shift work system, intense work tempo and exposure to violence can cause serious psychosocial problems for health workers (Caruso, 2014; Saygun, 2017). The most important occupational disease and cause of death of healthcare workers is infection. This situation arises as a result of both the working environment and the contact with the infected materials of the patients. Although its negative effects can be prevented by vaccination, it is of great importance to make the necessary risk assessment in this context (Meydanlioglu, 2013). NIOSH stated that there are 25 types of chemical, 29 types of physical, 6 types of ergonomic, 24 types of biological, and 10 types of psychosocial hazards and risks in hospitals. The provision of safe, efficient and qualified health services depends on the performance and capacity of health workers. This is an important issue that needs to be emphasized as it will only be provided by a healthy and safe working environment for healthcare professionals (Ozkan & Emiroglu, 2006). This situation has gained even more importance with the declaration of the World Health Organization (WHO) as a Covid-19 pandemic on 12 March 2020, which emerged at the end of 2019 (https://www.who.int/). Mass closures and curfews have been declared around the world, and healthcare workers have been at the forefront of the fight against the pandemic. This study addresses the employees working in the health sector and the risks caused by sector-specific hazards. There are many studies in the literature on the health sector. However, no study was found in which AHP and ENTROPY methods were used together. The AHP method is one of the MCDM methods used to select the best one among multiple alternatives. The ease of making group decisions and the ability to handle inconsistency makes the AHP method more advantageous than many other MCDM methods (VIKOR, PROMETREE, TOPSIS, etc.). ENTROPY is a method in which criterion weights are determined in an objective manner (Kucukonder & Demirarslan, 2017; Kocoglu, 2019). The criteria and sub-criteria used in the study were developed as a result of the opinions and suggestions of experts in the field and literature research. In this study, methods that include the objective-subjective decisions of the participants, such as AHP-ENTROPI, were used, unlike the classical risk assessment or checklist applications. In this way, it is expected that the study will contribute significantly to the literature. In the literature research, Liu (2010) used the AHP method to measure digital capital for the hospital service website (Liu, 2010). Karagiannidis et al. (2010) they evaluated the alternatives for the heat treatment process of infectious wastes in hospitals with AHP methods (Karagiannidis et al., 2010). Tsai et al. (2010) used the AHP method to propose a model for evaluating hospital organizational performance (Tsai et al., 2010). Tuzuner & Ozaslan (2011) conducted a study on the evaluation of occupational health and safety in hospitals. With the study, they tried to determine the safety climate perceptions of hospital employees (Tuzuner & Ozaslan, 2010). Agac & Baki (2016) investigated the use of multi-criteria decision-making methods in the field of health. As a result of the study, they determined that the AHP method is the most used method, and the ANP method is the most preferred integrated method (Agac & Baki, 2016). Solmaz and Solmaz (2017) researched the issue of occupational health and safety in hospitals (Solmaz & Solmaz, 2017). Gurer (2018) conducted a study on employee safety in healthcare services. The research emphasized the importance of ensuring the safety of healthcare professionals and discussed the risks they may encounter as well as the preventive measures that can be taken to mitigate these risks (Gurer, 2018).

MATERIAL AND METHODS

The term entropy was first proposed by Rudolf Clausius in 1865. It is known as a criterion of dispersion and disorder in thermodynamics. It has become information entropy by finding a different usage area by Sahnnon. Accordingly, entropy is stated as a measure of uncertainty about random variables (Zhang et al., 2011). The entropy method is the calculation of uncertainty. (Altan et al., 2021). This term was developed by Lee and Wang for the purpose of measuring weight. If the data of the decision matrices are known, the weights can be calculated objectively (Konuşkan & Uygun, 2014). Entropy method is one of the most preferred methods in the literature in terms of including objective decisions (Kucukonder & Demirarslan, 2017). For this reason, the entropy method was preferred. AHP is a mathematical theory used for decision making and measurement developed by Thomas L. Saaty in the 1970s (Saaty & Niemira, 2006). The AHP method is a frequently preferred method in the literature and has been used in almost many studies on multi-criteria decision making in recent years (Ho, 2008). The most important reason for this is thought to be easier to understand by decision makers (Supciller & Capraz, 2011). The fact that AHP includes objective and subjective decisions to choose the best one among multiple alternatives in decision making problems makes this method more advantageous than other decision making methods. The AHP method was preferred due to the ease and clarity of its analysis. The criteria and sub-criteria used in the study were determined based on verbal opinions and suggestions gathered from experts working in three different institutions. Additionally, a literature review was conducted to further support the study (Bulut et al., 2020; Workplace Hazard Class Notification on Occupational Health and Safety, 2011; Meydanlıoglu, 2013; Solmaz & Solmaz, 2017; Aydın Yuksekdag, 2019; Tuzuner & Özaslan, 2010). Consent was obtained from each participation in the study. In this context, the main criteria for the risks that health workers are exposed to were determined as follows: biological risks (such as viral and bacterial infections), chemical risks (including disinfectants, nanomaterials, and anesthetic agents), physical risks (such as thermal discomfort and ionizing radiation), ergonomic risks (such as patient lifting and maintaining fixed positions), and psychological risks (such as exposure to violence, shift work, and stress).The healthcare industry is one of the most dangerous business lines. It is an extremely important business line for the society to maintain a healthy life. Especially in the Covid-19 process, this situation has been felt much more deeply and many academic studies have been carried out for the health sector and its employees. In this study, it is aimed to prioritize the risks faced by healthcare professionals apart from classical studies. Two different analysis methods were used in the study, emergency service personnel (4 people), emergency medical technicians (2 people), other health personnel (3 people), radiology (1 person), paramedics (1 person), nurses (2 people) and workplace physicians (2 people). The selection of participants for the study was carefully made to include individuals who had received occupational health and safety training from universities, public institutions, and private organizations. The results of the analysis were compared within the framework of the literature and recommendations were made for a more sustainable occupational safety of the health sector and its employees.

Entropy method

The following steps are followed in solving the entropy method (Karaatlı, 2016).

Step 1: The pij in equation 1 is calculated by normalizing to eliminate the outliers in different measurement units.

$$p_{ij} = \frac{a_{ij}}{\sum_{i=1}^{m} a_{ij}}; \forall j \quad (1)$$

Step 2: The entropy of Ej seen in Equation 2 is calculated.

$$E_j = \frac{-1}{\ln(m)} \sum_{i=1}^{m} [Pij ln Pij]; \forall j \quad (2)$$

Step 3: The dj uncertainty in equation 3 is calculated as the degree of diversity.

$$dj = 1 - Ej\ ; \forall j \quad (3)$$

Step 4: The wj weights are calculated as the degree of importance of the j criterion in Equation 4.

$$Wj = \frac{d_j}{\sum_{j=1}^{n} d_j}; \forall j \quad (4)$$

Here aij j. For index i. the value of the alternative; Pij i. j for alternative. is the value scale of the index.

Analytic hierarchy process methods

The following steps are followed in the solution of the AHP method. After determining the problem, a hierarchical structure is created. A pairwise comparison matrix is created between the criteria. The purpose of the pairwise comparison is to determine the importance levels of the criteria. After this process, the comparison matrix is normalized and all priorities vector are calculated. The consistency index is calculated. At this point, the consistency index is divided by the random index. Thus, the consistency ratio is calculated. Finally, it is checked whether the consistency ratio is less than 0.1>. If the result is below this value, it is accepted that the importance levels of the criteria are consistent (Supçiller & Çapraz, 2011; Sacak et al., 2019).

Ethical consideration

Ethics Committee Approval Gumushane University Rectorate Scientific Research and Publication Ethics Board was obtained for this study on 29/08/2023 (Approval no: 2023/4).

Equation 1 is used to normalize the pairwise comparison matrix.

$$a'_{ij} = \frac{a_{ij}}{\sum_{i=1}^{n} a_{ij}} \quad (1)$$

Equation 2 is used in all priorities vector calculation.

$$w_i = \left(\frac{1}{n}\right)\sum_{j=1}^{n} a'_{ij} \quad (2)$$

i,j= 1,2,3,….n

λ_{max} Equation (3) is used to calculate the value (Ozbek, 2017).

$$\lambda_{max} = \left(\frac{1}{n}\right)\sum_{i=1}^{n}\left(\frac{\sum_{j=1}^{n} a_{ij}.w_j}{w_i}\right) \quad (3)$$

Table 1 is taken into account in determining the random index.

Table 1. Random index (Guner, 2005).

n	**1**	**2**	**3**	**4**	**5**	**6**	**7**
R1	0	0	0.58	0.90	1.12	1.24	1.32

Finally, equation 4 is used to calculate the consistency index (Ozbek, 2017).

$$CI = \frac{(\lambda_{max} - n)}{(n-1)} \quad (4)$$

RESULTS

The steps followed in the study and the results obtained from the analysis are given below. The risks that healthcare workers are exposed to at work were evaluated by Entropy and AHP methods. In the analysis, a total of five main criteria and thirteen sub-criteria were formed; C-1-Biological Risks (pin sting, viral infection, Bacterial infection), C-2 Chemical Risks (Disinfectants, Nanomaterials, anesthetic agents), C-3 Physical Risks (thermal comfort, ionizing radiation), C-4 Ergonomic Risks (Patient lifting, fixed position) and C-5 Psychological Risks (exposure to violence, shift work, stress). In the first stage of the study, the Entropy method was used. Entropy method analysis results are as follows. In the solution of the analysis, the results were obtained by following the order specified in the method section. In Table 2, each criterion decision matrix was created. In Table 3, the normalized matrix was calculated. Entropy values for the criteria are calculated in Table 4. In Table 5, wj weights were calculated and each criterion was ranked according to the level of importance.

Table 2. Decision matrix.

	C-1	**C-2**	**C-3**	**C-4**	**C-5**
C-1	1	2.71	4.72	0.64	4.78
C-2	0.37	1	4.79	5.43	0.94
C-3	0.21	0.21	1	3.68	0.33
C-4	1.56	0.18	0.27	1	0.18
C-5	0.21	1.06	3.03	5.55	1
Total	3.35	5.16	13.81	16.3	7.23

Table 3. Normalized matrix.

	C-1	**C-2**	**C-3**	**C-4**	**C-5**
C-1	0.2985	0.5251	0.3417	0.0392	0.6611
C-2	0.0649	0.1314	0.2091	0.1699	0.0971
C-3	0.0394	0.0317	0.0552	0.1387	0.0377
C-4	0.3046	0.0281	0.0157	0.0437	0.0214
C-5	0.0589	0.1704	0.1799	0.2540	0.1215
Total	1	1	1	1	1

Table 4. Entropy values for the criteria.

	C-1	**C-2**	**C-3**	**C-4**	**C-5**
C-1	-0.3608	-0.3382	-0.3272	-0.1271	-0.2735
C-2	-0.1775	-0.2666	-0.1599	-0.3011	-0.2264
C-3	-0.1274	-0.1095	-0.0654	-0.274	-0.1237
C-4	-0.3621	-0.1004	-0.3086	-0.1369	-0.0822
C-5	-0.1669	-0.3015	0	-0.3480	-0.2561
Total	-1.1948	-1.1164	-0.8612	-1.1873	-0.9621

Table 5. Calculation of wj weights.

k=1ln(m)	0.62					
k=0.621						
ej=	0.74	0.69	0.53	0.73	0.59	
ed=	0.258	0.30	0.46	0.26	0.41	
	5(C1)	4(C2)	1(C3)	3(C4)	2(C5)	**Total**
wj=	0.152	0.18	0.27	0.15	0.24	1

In the second stage of the study, the AHP method was used. The analysis results of the AHP method are as follows. In solving the analysis, the steps specified in the methodology section were followed, and the results were obtained. In Table 6, the decision matrix for each criterion was created. Subsequently, the normalized matrix and priority vector calculations were performed. In Table 7, the λmax value and consistency index were calculated.

Table 6. Decision matrix.

	C-1	**C-2**	**C-3**	**C-4**	**C-5**
C-1	1	1.414	2.451	1.732	0.948
C-2	0.707	1	2.451	1	0.332
C-3	0.408	0.408	1	1.414	0.332
C-4	0.577	1	0.707	1	0.316
C-5	1.055	3.012	3.012	3.165	1
Total	3.747	6.834	9.621	8.311	2.928

Table 7. Consistency index calculation.

Total	**W**	**T/W**	**Average**	**Lamda Max.**
1.246	0.252	4.94	5.0966	**Consistency İndeks**
0.847	0.165	5.133		0.0242
0.565	0.111	5.09		**Rassal İndeks**
0.617	0.12	5.14		0.0242/RI
1.826	0.352	5.18		**0.1>0.0216**

DISCUSSION

The analysis results of Entropy and AHP methods used in the study are given in Table 8. Considering the results obtained from each analysis, the following conclusions were reached. As a result of the comparison made between the main criteria used in the entropy method, the criterion with the highest weight (wj) was C-3 (physical risk factors) with a value of 0.273. This was followed by C-5 (psychological), 0.154 C-4 (ergonomic factors), 0.180 C-2 (chemical risks), 0.152 C-5 (biological factors) with a value of 0.241, respectively. As a result of the entropy method, the risk with the highest level of importance that health workers are exposed to in the workplace was physical risks (thermal comfort and ionizing radiation). The following results were obtained from the analysis of the AHP method. According to the results of the comparison between the main criteria, the criterion with the highest weight was the C-5 criterion, namely psychological risks, with a value of 0.351542. This was followed by C-1 biological risks, C-2 chemical risks, 0.12041 C-4 ergonomic risks, and 0.111121 C-4 physical risks with a value of 0.252142, respectively. As a result of the comparison between the sub-criteria, the following results were obtained. As a result of the comparison made between the sub-criteria related to the C-1 main criterion, the sub-criterion with the highest weight was viral infection with 0.44093. This result was followed by 0.31826 needle sticks and 0.24081 bacterial infections, respectively. As a result of the comparison made between the sub-criteria related to the main criterion of C-2 chemical risks, the sub-criterion with the highest weight was 0.56555 aesthetic substances. This was followed by 0.24684 nanomaterials and 0.18763 disinfectants, respectively. As a result of the comparison made between the sub-criteria related to the C-3 main criterion, the following results were obtained. The highest sub-criteria was 0.55761 ionizing radiation. This result was followed by thermal comfort at 0.44240. In the comparison among the sub-criteria related to the main criterion C-4, the sub-criterion with the highest value was patient lifting at 0.22656, while the lowest sub-criterion was fixed positions at 0.16698. In the comparison of sub-criteria under the main criterion C-5, the highest weighted sub-criterion was stress at 0.51313. This was followed by shift work at 0.28712 and exposure to violence at 0.19974, respectively. As a result of the analysis using the entropy method, the criterion with the highest weight was C-3 physical criteria at 0.273, whereas the highest weighted criterion in the AHP method analysis was C-5 psychological factors at 0.351542. Considering the method and subject content, it is possible to find similar studies in the literature. For example, Yüksekdağ (2019) examined the situation of exposure to occupational risks in healthcare institutions using the AHP method. According to the analysis results among the criteria, the highest-weight criterion was physical risks at 0.231, followed by psychosocial risks at 0.216, chemical risks at 0.193, biological risks at 0.189, and ergonomic risks at 0.172 (Yüksekdağ, 2019). Gül et al. (2017), using fuzzy AHP and Fuzzy VIKOR methods, ranked the most significant hazards in hospitals as electricity, infection, fire, and other risks arising from emergencies (Gül et al., 2017).

The Importance of Psychological and Physical Risks: The high weight of psychological risks in the AHP analysis indicates the critical importance of healthcare workers' mental health. Stress management programs, counseling services, and psychosocial support systems can be recommended to support employees' psychological well-being.

Management of Physical Risks: The significance of physical risks identified through the entropy method (such as thermal comfort and ionizing radiation) is of vital importance. At this point, stricter safety standards and training programs can be implemented in the healthcare sector to reduce physical risks.

Table 8. Entropy and AHP method analysis data.

AHP Method				**Entropi Method**					
Criteria	**W**	**Sub-Criteria (S.C.)**	**S.C. W.**		**C-1**	**C-2**	**C-3**	**C-4**	**C-5**
		Needle stick	0.31826	Ranking of Importance	5	4	1	3	2
		Viral infection	**0.44093**	k=1ln(m)					
Biological Risks (C-1)	0.252142	Bacterial infection	0.24081	**k=0.621**					
		Disinfectants	0.18763	ej	0.742	0.693	0.535	0.737	0.59
		Nano materials	0.24684	ed	0.258	0.307	0.465	0.263	0.41
Chemical Risk (C-2)	0.164695	Anesthetic substances	**0.56555**	wj	0.152	0.180	0.273	0.154	0.241
		Thermal comfort	0.44240						
Physical Risks (C.-3)	0.11121	Ionizing radiation	**0.55761**						
		Patient lift	**0.22656**						
Ergonomic Risks (C-4)	0.12041	Fixed position	0.16698						
		Exposure to violence	0.19974						
		Shift work	0.28712						
Psychological Risks (C-5)	0.351542	Stress	**0.51313**						

CONCLUSION

Identifying existing and new risks in the health sector is of great importance for the sustainability of a healthy society. For this reason, the risks that health workers are exposed to in the workplace were evaluated with Entropy and AHP methods, taking into account both expert opinions and literature research. The study was carried out using methods that are thought to respond to people's needs other than traditional risk assessment-detection. For this reason, analysis methods that include objective and subjective decisions were preferred in the study. According to the results of the analysis using the AHP method, the criterion with the highest level of importance was psychological risks, while the criterion with the lowest level of importance was physical risks. As a result of the analysis using the entropy method, the wj value with the highest weight was the physical risk factors. When the results of the two analyzes were compared, it was seen that the significance levels were different. The main reason for this difference is thought to be due to the fact that the participants in the research consist of people with different job descriptions and their interest in different needs. Health sector is in the very dangerous class according to the Occupational Health and Safety Workplace Hazard Class Notification. In this respect, it is important for the sustainability of occupational health and safety of health workers. In particular, issues such as irregular working conditions of healthcare workers, mobbing, fear of being beaten, poor concentration, insomnia should be addressed comprehensively. Because the health sector and its employees to keep the possible risks at a minimum level is an important element for the development of societies and countries. For this reason, authorities should develop permanent solutions for these problems that the health sector and health workers are exposed to. Future researchers are encouraged to prioritize the study of risk factors affecting the psychological well-being of healthcare workers. This focus can help identify the most significant stressors in the healthcare environment and inform targeted interventions to improve mental health support for healthcare professionals. You can speed up data collection and analysis processes by utilizing digital platforms and technological tools, leading to the development of innovative solutions for the health of healthcare workers.

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Attitudes of Parents with Vaccine Hesitancy and Refusal After COVID-19

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ABSTRACT

Objective: Vaccine hesitancy is a delay in vaccine acceptance despite the presence of vaccine service or rejection of specific vaccines. This study was conducted to determine the attitudes of parents with vaccine hesitancy and vaccine rejection toward vaccine after COVID-19 and the affecting factors. **Materials and Methods:** The present cross sectional study was conducted with 147 parents, who were contacted through vaccine-related health records, had not gotten their children vaccinated or refused to complete the vaccination of their children during the COVID-19 pandemic in 2019 and 2020. Data were collected using the Descriptive Characteristics Questionnaire and the Vaccine Hesitancy Scale. **Results:** Of the parents, 71.4% stated that they had made the decision of not getting their children vaccinated after one vaccine or a few vaccines. In the study, attitudes toward vaccine had changed positively in 23.8% of the parents after COVID-19. It was determined that the parents' being mother or father, educational status and number of children significantly affected the Vaccine Hesitancy Scale score ($p<0.05$). **Conclusion:** Vaccine hesitancy was higher among: parents with higher level of education, parents with fewer children and parents had experienced hesitancy for their children after a few vaccines.

Keywords: Child, COVID-19, Parent, Immunization, Vaccine Hesitancy.

COVID-19 Sonrası Aşı Tereddütü ve Reddi Olan Ebeveynlerin Tutumları

ÖZ

Amaç: Aşı tereddütü, aşı hizmetinin varlığına veya belirli aşıların reddedilmesine rağmen aşının kabulünde gecikmedir. Bu araştırma, aşı tereddütü olan ve aşıyı reddeden ebeveynlerin COVID-19 sonrası aşıya yönelik tutumlarını ve etkileyen faktörleri belirlemek amacıyla yapıldı. **Gereç ve Yöntem:** Bu kesitsel araştırma, 2019 ve 2020 yıllarında yaşanan COVID-19 salgını sırasında aşıyla ilgili sağlık kayıtları aracılığıyla iletişime geçilen, çocuklarına aşı yaptırmayan veya çocuklarının aşılarını tamamlamayı reddeden 147 ebeveyn ile yürütülmüştür. Veriler Tanımlayıcı Özellikler Anket Formu ve Aşı Tereddütü Ölçeği kullanılarak toplanmıştır. **Bulgular:** Ebeveynlerin %71.4'ü bir ya da birkaç aşıdan sonra çocuklarına aşı yaptırmama kararı aldıklarını ifade ettiler. Araştırmada, ebeveynlerin %23.8'inin COVID-19 sonrasında aşıya yönelik tutumları olumlu yönde değişti. Ebeveynlerin anne veya baba olmasının, eğitim durumunun ve çocuk sayısının Aşı Tereddüt Ölçeği puanını anlamlı düzeyde etkilediği belirlenmiştir ($p<0.05$). **Sonuç:** Aşı tereddütü şu kişilerde daha yüksekti: eğitim düzeyi daha yüksek olan ebeveynler, daha az çocuğu olan ebeveynlerde ve birkaç aşıdan sonra çocuklarına karşı tereddüt yaşayan ebeveynlerde.

Anahtar Kelimeler: Çocuk, COVID-19, Ebeveyn, Bağışıklama, Aşı Reddi.

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INTRODUCTION

Proven by several scientific research, immunization is an effective tool for protecting public health and preventing diseases and one of the most important inventions of the 20th century (Spencer, Pawlowski, & Thomas, 2017). Vaccines reduce the prevalence of diseases. However, every unvaccinated individual poses a risk for most newborns, infants and young children who are not vaccinated, have not reached the vaccination age or who have not completed the vaccine calendar to contact active ingredients during the early period (Dubé, Vivion, & MacDonald, 2015). It has been reported by the World Health Organization (WHO) that an estimated 25 million children under the age of one are not basic vaccinated, and the number of children whose vaccinations are not completed in 2021 has increased by five million compared to 2019. WHO defines vaccine hesitancy as "delay in accepting or rejecting vaccines despite the availability of vaccine services"(WHO, 2014). Vaccine hesitancy has been highlighted as a broader concept including vaccine rejection (Larson et al., 2015). Additionally, in 2019 WHO pointed at vaccine rejection as one of the ten threats against global health (WHO, 2019). Due to the diffusion of antivaccine movements worldwide, WHO established the Vaccine Hesitancy Working Group in 2012.

The effort of keeping children healthy is a great source of concern for parents. This concern causes their decisions about their children's healthcare to be affected by several factors (Allan & Harden, 2014). Although parents support vaccines in general, concerns about vaccine safety and serious side effects are among the main reasons why childhood vaccines are delayed or rejected even in western societies (Dubé et al., 2015; Smith et al., 2011; Williams, 2014; Yaqub, Castle-Clarke, Sevdalis, & Chataway, 2014). Lack of knowledge of parents about situations that do not prevent vaccination is an important factor. In a study, parents reported that they should not have any signs of illness (fever, diarrhea, flu, womiting, problems in teething, etc.) in order to vaccinate their children (Burghouts et al., 2017). Most studies suggest that there is a lack of information among parents about vaccine risks (Gardner, Davies, McAteer, & Michie, 2010; Raithatha, Holland, Gerrard, & Harvey, 2003). This lack of information affects 'nonspecific' fears related to the side effects (Smailbegovic, Laing, & Bedford, 2003) and there is a lack of awareness regarding the risks of not being vaccinated (Gardner et al., 2010). Among the other commonly reported reasons of vaccine rejection are the number of vaccines and the perception that they may overdo the immune system(Hilton, Petticrew, & Hunt, 2006). Some parents believe that alternative medicine will be adequate instead of vaccines (Zuzak, Zuzak-Siegrist, Rist, Staubli, & Simoes-Wüst, 2008). Owing to the success of vaccines, most parents do not make contact with children suffering from diseases preventable by vaccines any longer. Therefore, some parents have a hesitancy about the necessity for their children to be vaccinated against rare diseases (Janko, 2012).

The coronavirus disease 2019 (COVID-19) pandemic has caused a rising number of cases and mortality rates and a strain on healthcare systems around the world. The ongoing public health crisis from COVID-19 has had devastating effects in every country. It has caused significant morbidity and mortality rates, adverse psychological consequences and increased socioeconomic losses in human lives, in addition to disrupting the hard-won progress achieved over the past decade to improve vaccination rates. These consequences of the COVID-19 pandemic have made it even more important to understand the factors that contribute to antivaccine attitudes or parental refusal of vaccination (Olusanya, Bednarczyk, Davis, & Shaban-Nejad, 2021). Growing rate of parents who choose to delay or reject vaccines recommended for their children is an increasing problem which causes the reemergence of diseases preventable by vaccines. The literature has a great number of studies aiming to determine vaccine hesitancy in parents however, there are few studies on the effects of the pandemic. In order to identify effective interventions to reduce vaccine hesitancy, it is noteworthy to know the characteristics of this group, what factors drive them to develop antivaccine attitudes and how the COVID-19 pandemic has affected the current situation. The present study was conducted to determine the attitudes of parents with vaccine hesitancy and vaccine rejection toward vaccine after COVID-19 and the affecting factors.

MATERIALS AND METHODS

Design and population of the study

The present descriptive cross sectional study was conducted in a province with the highest child population in southeastern Turkey between September 2021 and February 2022 during the COVID-19 pandemic to determine the characteristics of parents with vaccine hesitancy and what drives them to develop antivaccine attitudes. The sample size for the study was found to be 142 individuals at 0.09 effect size, 0.01 significance level and 99% power using the GPOWER 3.1.0 statistics program. The parents with vaccine hesitancy were determined from the medical institution where vaccine-related records were kept in 2019 and 2020. Considering the number of districts of the parents who did not complete their children's vaccines (vaccine hesitancy) and who did not get their children vaccinated (vaccine rejection), the number of individuals from each district to be included in the study was determined. The number of individuals to be chosen from the districts was determined via the stratified sampling method and whom to include via the simple random sampling method. In the study, 322 parents were interviewed and 172 parents could not be reached due to false phone numbers. Three

parents did not agree to take part in the study and as a result, the analyses were performed with 147 parents.

Data collection tools

The study data were acquired using the Descriptive Characteristics Questionnaire and the Vaccine Hesitancy Scale-short form. The Descriptive Characteristics Questionnaire has 24 questions and two sections. The first section includes questions about children and their parents (such as age, gender, parents' educational status, number of children) and the second section includes questions about vaccine hesitancy. In the study, the data were collected via phone calls since the study coincided with the pandemic. In the study, the sample was determined and then the parents with vaccine hesitancy were interviewed through their phone numbers in their health records in the medical institution. All interviews were conducted by the same researcher. The researcher explained the significance and purpose of the study and addressed the questions in the survey after obtaining necessary permissions. The data collection process took 10 to 15 minutes.

The Vaccine Hesitancy Scale-Short Form: Kılıcarslan et al. developed the scale in 2020. The scale has three subscales and 12 items as vaccine benefit and protective value (subscale A, four items), antivaccine (subscale B, 5 items) and solutions to not being vaccinated (subscale C, three items). Since section A includes items in favor of vaccine, which are "Strongly disagree"-one point and "Strongly agree"- five points, it is graded reversely. The lowest and highest possible scores obtainable from the scale are 12 and 60, respectively. As the score increases, antivaccine increases. The Cronbach's alpha reliability coefficient of the scale was 0.855. The scale language is Turkish (Goktug Kılıncarslan, Sarıgül, Toraman, Melih Sahin, & Göktuğ Kılınçarslan, 2020).

Statistical analysis

The data were analyzed via the IBM SPSS V25. Normal distribution was examined via kurtosis and skewness values. Descriptive data were evaluated via number, percentage, mean and standard deviation. In analysis of the data, the independent sample t test, Mann-Whitney U test and Kruskal-Wallis analysis were used. For post-hoc analysis, the Bonferroni correction Mann-Whitney U test was used. The significance level was set at $p<0.050$.

Ethical approval

Prior to the study, the researcher obtained written permission from the Harran University Ethics Committee (Date: 24.05.2021, Approval no: 10), and the Provincial Department of Health. Prior to the study, the researcher informed the parents and received their oral consent.

RESULTS

Introductory characteristics of the parents

Of the participants, 51% (n=75) were father, 56.5% (n=83) were aged 30 to 39 years and 96.6% (n=142) were married. 60.5% of the parents indicated their income to be middle. 42.9% of the parents had four and more children. Of the mothers, 29.3% (n=43) were primary school graduate and of the fathers, 29.3% (n=43) were university graduate. Examining the employment status, 90.5% of the mothers were not employed and 51% (n=75) of the fathers were freelancer. Of the children who were not vaccinated, 57.8% (n=85) were male, 41.5% (n=61) were aged one year to three years, 55.1% (n=81) were aged three to six years and 3.4% (n=5) were aged six to twelve years. When the parents were asked whether they had any health condition preventing them from getting their children vaccinated or not, 2.7% (n=4) stated that they had allergy, 4.8% (n=7) had undergone a surgery, 5.4% (n=8) were diagnosed with cancer, 0.7% had had eclampsia and 1.4% had had a seizure.

The mean total vaccine hesitancy scale and subscale scores

The mean total Vaccine Hesitancy Scale score was 44.11±11.03 (20-60), the mean subscale A score was 13.51±4.93 (4-20), the mean subscale B was 20.39±5.12 (7-25) and the mean subscale C score was 10.20±2.27 (4-15).

Of the parents, 96.6% had vaccine hesitancy and 3.4% had never gotten their children vaccinated/had vaccine rejection. Of the parents who did not complete their children's vaccination, 71.4% (n=105) had made the decision of not getting their children vaccinated after one vaccine or a few vaccines. The decision of not getting their children vaccinated was made by both parents at the level of 39.5%. Examining the reasons for parents not to get their children vaccinated, the highest rate was not trusting the vaccine content at the level of 12.9% (n=19), which was followed by negligence at the level of 17% (n=25). Of the parents, 23.8% stated that their attitudes toward vaccine had changed after the COVID-19 pandemic and 23.1% stated that they understood the importance of vaccines in preventing illnesses.

Factors affecting the attitude toward vaccine

Table 2 demonstrates a comparison of the mean total Vaccine Hesitancy Scale and subscale scores according to specific characteristics of the parents and children (Table 2). There was a significant difference between the mean total Vaccine Hesitancy Scale and all subscale scores of the parents ($p<0.05$). As a result of the analysis, it was determined that the scores of the mothers (47.69±9.51) were higher than the scores of the fathers (40.68±11.35) at a statistically significant level ($t=4.066$, $p<0.01$). According to the number of children, it was determined that there was a difference only between the vaccine benefit and protective value subscale A ($X^2_{KW}=8.850$, $p<0.05$). In an advanced analysis conducted, it was determined that the difference was caused by parents who had four and more children and those who had two children and between the parents who had four children and those who had one child (Table 2).

According to maternal education, it was determined that there was a significant difference between the mean total antivaccine scale score (X^2_{KW} =14.761, p<0.05) and the mean A and B subscale scores ($X^2_{KW=}$18.334, p<0.003; X^2_{KW}=12.250, p<0.32). There was no significant difference between the total Vaccine Hesitancy Scale and subscale scores of the parents according to their age ($X^2_{KW=}$5.321, p=0.150), marital status (U=406.500, p=0.872) and income status ($X^2_{KW=}$ 1.462 p=0.227).

Table 1. Characteristics of the parents related to vaccine hesitancy (n=147) *.

Variable	n	%
Time of the decision of not getting the child vaccinated		
Prepregnancy	24	16.3
During pregnancy	14	9.5
After the child is born	4	2.7
After one vaccine or a few vaccines	105	71.4
Vaccine status		
I got him/her have the first dose of Hepatitis B vaccination	41	27.9
I got him/her vaccinated at one month	12	8.2
I got him/her vaccinated at six months	18	12.2
I got him/her vaccinated at twelve months	14	9.5
I got him/her vaccinated at 18 months	33	10.2
I have never gotten him/her vaccinated	5	3.4
I haven't gotten him/her have live vaccines	7	4.8
Who made the decision of not getting the child vaccinated?		
Mother	37	25.2
Father	31	21.1
Family elders	1	0.7
Mother and father	58	39.5
What causes you to have vaccine hesitancy?		
I believe that vaccines are dangerous	8	5.4
I don't believe that vaccines will be useful	12	8.2
I don't trust vaccine content	19	12.9
The problems experienced by the people around have prevented me from having vaccines	4	2.7
Because my partner and other family elders do not want it	2	1.4
I wasn't vaccinated as a child	2	1.4
I was affected by negative news related to vaccines on media	1	0.7
Negligence	25	17.0
It wasn't recommended due to my child's disease	21	14.3
I believe that vaccines are dangerous and I don't believe that they are useful. I don't trust vaccine content. People around me experience problems after vaccines	18	19.1
Others	25	17.0
Have you or a relative of yours had suffered from a contagious disease? (Yes)	58	39.5
Have you lost a relative to a contagious disease? (Yes)	9	6.1
Has your child been diagnosed with a disease preventable by vaccines? (Yes)	5	3.4
Has your attitude toward vaccines changed after the COVID-19 pandemic? (Yes)	35	23.8
Was the mother vaccinated during pregnancy? (Yes)	100	68.0
How has your attitude toward vaccines changed during the COVID-19 pandemic?		
I have decided to get my child fully vaccinated	1	0.7
I have understood the importance of vaccines in preventing diseases	34	23.1

* The parents gave more than one answers to specific questions. In specific questions, some parents did not answer.

Table 2. A comparison of the mean total vaccine hesitancy scale score and subscale scores according to the characteristics of the parents and children (n=147) *.

Variable	Total	Benefit and protective value	Antivaccination	Solutions to not being vaccinated
Parent	**M±SD**	**M±SD**	**M±SD**	**M±SD**
Mother (n=72)	47.69±9.51	15.01±4.65	21.79±4.18	10.88±1.87
Father (n=75)	40.68±11.35	12.08±4.80	19.05±5.59	9.54±2.44
t p	4.066 <0.01	3.758 <0.01	3.370 <0.01	3.750 <0.01
Parent's age				
Under 20 years (n=2)	41.01±21.21	13.02±8.48	17.01±8.48	11.01±4.24
21-29 years (n=42)	43.09±11.74	13.47±4.90	19.71±5.60	9.90±2.31
30-39 years (n=83)	45.68±10.54	14.08±501	21.02±4.82	10.57±2.08
Over 40 years (n=20)	40.05±10.13	11.30±4.11	19.55±4.97	9.20±2.56
X^2_{KW} p	5.321 0.150	5.160 0.160	2.833 0.418	6.543 0.088
Marital status				
Married (n=142)	44.16±11.01	13.49±4.90	20.46±5.14	10.20±2.25
Single (n=5)	43.00±12.58	14.00±6.22	18.83±4.79	10.16±3.06
U p	406.500 0.872	384.500 0.704	300.500 0.220	410.500 0.900
Income status				
Bad (n=37)	40.67±11.15	12.02±5.16	19.13±5.16	9.51±2.50
Middle (n=89)	44.84±11.14	13.84±4.91	20.64±5.21	10.35±2.23
Good (n=21)	47.09±9.24	14.76±4.18	21.57±4.38	10.76±1.78
X^2_{KW} p	1.462 0.227	0.457 0.499	1.267 0.260	2.474 0.116
Number of children				
1 child (n=20)[a]	45.25±10.42	13.70±5.01[a]	20.85±4.46	10.70±2.07
2 children (n=41)[b]	47.82±9.52	15.48±4.11[b]	21.65±4.52	10.68±1.86
3 children (n=23)[c]	39.34±12.41	12.04±5.28[c]	18.17±5.94	9.13±2.56
4 children and more (n=63)[d]	43.07±11.00	12.71±4.98[d]	20.23±5.19	10.12±2.37
X^2_{KW} p	7.466 0.058	8.850 0.031 b>d>c=a	0.4533 0.209	6.433 0.092
Gender of the child				
Female	45.32±10.30	13.67±4.60	21.30±4.82	10.33±2.23
Male	43.23±11.51	13.40±5.19	19.72±5.25	10.10±2.30
t p	1.154 0.251	0.335 0.738	1.858 0.065	0.611 0.542
1-3 years (n=61)	42.78±11.36	13.21±4.89	19.60±5.33	9.96±2.30
3-6 years (n=81)	45.16±10.79	13.77±5.02	20.98±4.93	10.39±2.28
6-12 years (n=5)	43.40±11.14	13.00±4.63	20.40±5.17	10.00±1.87
X^2_{KW} p	1.297 0.255	0.439 0.507	2.899 0.089	1.003 0.317

Table 2 (Continued). A comparison of the mean total vaccine hesitancy scale score and subscale scores according to the characteristics of the parents and children (n=147) *.

Variable	Total	Benefit and protective value	Antivaccination	Solutions to not being vaccinated
Educational background of the mother				
Literate (n=9)[b]	43.00±12.75	13.22±5.35	20.11±4.80	9.66±3.67
Primary school (n=43)[c]	41.23±11.12	12.30±4.92	19.11±5.33	9.81±2.29
Secondary school (n=20)[d]	44.30±10.49	13.75±4.82	20.40±4.93	10.15±2.18
High school (n=17)[e]	48.35±10.49	15.76±5.12	21.70±4.45	10.88±1.65
University (n=27)[f]	50.51±5.28	16.18±3.19	23.18±2.70	11.14±0.76
X^2_{KW} p	14.761 0.011 f>a	18.334 0.003 f>a, f>c,e>a	12.250 0.032 f>c	9.620 0.087
Educational background of the father				
Nonliterate (n=31)[a]	30.80±7.19	8.40±2.88	15.00±5.95	7.40±1.81
Literate (n=9)[b]	38.88±12.53	11.55±4.58	17.88±6.79	9.44±1.74
Primary school (n=43)[c]	41.15±11.76	12.00±5.27	19.27±5.48	9.87±2.53
Secondary school (n=20)[d]	42.26±11.81	12.66±4.85	19.93±5.55	9.66±2.66
High school (n=17)[e]	47.03±9.97	14.70±4.81	21.48±4.37	10.85±2.28
University (n=27)[f]	48.48±7.98	15.53±4.11	22.04±3.67	10.90±1.39
X^2_{KW} p	17.082 0.004 f>a	18.387 0.002 f>c	10.038 0.074	15.096 0.010 f>a

M=Mean, SD= Standart Deviation, X^2_{KW}= Kruskal Wallis Test, U= Mann-Whitney U test, t= Independent t-test

DISCUSSION

In this study conducted to determine the attitude of parents with vaccine refusal and hesitation towards vaccination after COVID-19, it was determined that 23.8% of the parents had a positive attitude towards vaccination. Of the parents, 96.6% had vaccine hesitancy and 3.4% had never gotten their children vaccinated/had vaccine rejection. Of the parents who did not complete their children's vaccination, 71.4% had made the decision of not getting their children vaccinated after one vaccine or a few vaccines. The World Health Assembly has developed the Immunisation Agenda 2030 (IA2030) global strategy programme to ensure that individuals of all ages can benefit from the right to vaccination. In this programme, it was reported that the COVID-19 pandemic showed people the power of vaccines to fight diseases, save lives and build healthy futures (WHO, 2021).

In the present study, the parents' antivaccine scale score was higher. A study conducted by Aygün and Tartop (2020) to examine the vaccine hesitancy levels and reasons for antivaccine among parents found the vaccine hesitancy levels to be higher (Aygün & Tortop, 2020).

In the present study, the decision of parents not to get their children vaccinated was most made after one vaccine or a few vaccines. This decision was made by both parents. A study conducted by Henrikson et al. (2017) reported the highest vaccine hesitancy scores by mothers during the first months of the infant. As the child's age grew, vaccine hesitancy of the mothers decreased (Henrikson et al., 2017). The decision of one parent or a few parents not to get their children vaccinated after vaccination makes us consider the possibility of side effects after vaccination, pain experienced during vaccination and having inadequate information about vaccine benefits (Gardner et al., 2010; Raithatha et al., 2003; Smailbegovic et al., 2003). Studies conducted similarly demonstrated that the anxiety of parents for a serious side effect to be observed in the child after vaccination was among the common reasons why they did not get their children vaccinated (Dubé et al., 2019; Napolitano, D'Alessandro, & Angelillo, 2018). Therefore, in order to decrease the side effects during vaccination, it may be effective to carry out specific evidence based applications (such as using a longer needle to decrease injection area reactions (Beirne et al., 2015; Spencer et al., 2017). In the literature,

although parents have reported a variety of concerns about vaccines, one of the most common concerns is the belief that vaccines are painful for their children (Kennedy, Basket, & Sheedy, 2011). Making vaccination less painful by using nonpharmacological methods may decrease the stress level, negative approach to vaccines and thus hesitancy level in parents (Shah, Taddio, & Rieder, 2009). In addition, since the parents had made the decision of not getting their children vaccinated after one vaccine or a few vaccines at the highest rate, pregnancy and the period right after birth are to be evaluated as the best time to provide reassuring information and support to mothers regarding early childhood vaccines when medical staff and parents are already in touch.

Other factors causing the parents to have vaccine hesitancy were the belief that vaccines were not useful and might be harmful for their child, a lack of trust in vaccine content and the presence of people around who had experienced problems after vaccines. Most studies have stressed concern about vaccine safety (Dubé et al., 2019; Napolitano et al., 2018; Spencer et al., 2017). Additionally, studies have stated that vaccines are religiously wrong, there is no adequate information about vaccines and social media is ineffective in making decisions about vaccines (Aygün & Tortop, 2020). Examining the reasons for not vaccinating in detail, the actual reason in the present study and in most studies is a lack of knowledge about vaccines among parents (Dubé et al., 2019; Gardner et al., 2010; Napolitano et al., 2018). Besides a lack of information about vaccines, parents experience a problem with reaching safe information (Gardner et al., 2010). Doctors and other healthcare professionals are to inform parents who consider rejecting or delaying vaccines about vaccines and direct them to reliable information resources (CDC, 2021; Immunization Action Coalition, 2022). In addition, if a family rejects vaccination, they should be recorded and next visits should continue to discuss the benefits of vaccines. However, in this way parents may reconsider the decision of not getting vaccinated or decrease the number of vaccines delayed or not performed. Studies demonstrate that messages focusing on the dangers of not being vaccinated when giving information to parents about vaccines may be more convincing than those focusing on providing protection (Abhyankar, O'connor, & Lawton, 2008). In order to avoid looking prejudicial or causing unnecessary concerns, it is necessary to effectively and sensitively convey the risks related to both vaccination and nonvaccination (Gardner et al., 2010). Procurement of up-to-date information which have a higher level of evidence and are adapted according to individual needs to parents by healthcare professionals may prevent wrong information and beliefs related to vaccines.

Owing to the success of vaccines, most parents do not make contact with children suffering from diseases preventable by vaccines any longer (Janko, 2012). In the present study, 23.8% of the parents stated that their attitudes toward vaccine had changed positively due to COVID-19 and 23.1% stated that they understood the importance of vaccines in preventing illnesses after COVID-19 much better (Table 1). Considering the COVID-19 pandemic, most factors such as the decrease of death and illness rates after vaccination, return to normal life and decrease of lockdown measures have occurred owing to vaccines. In the present study, the status of parental characteristics to affect vaccine hesitancy was examined. Also, maternal and paternal education affected vaccine hesitancy at a statistically significant level, whereas age, marital status and income status did not. A study conducted by Aygün and Tortop (2020) did not obtain any significant difference according to the educational status of the participants and age of the parent. A study conducted by Özceylan et al. (2020) found that three out of every ten women with a higher level of education did not believe that vaccination was useful and this rate was ten times greater than the group with a lower level of education. In the past years, lower educational and socioeconomic level has decreased the possibility of accessing vaccines, which has decreased the ratio of vaccination. Vaccine hesitancy which has recently emerged has become more common among educated individuals who have no problem with vaccine access. More educated individuals with a higher level of income may have a higher rate of anxiety and thus of antivaccination due to imperfect or wrong information. At this point, the importance of raising awareness on reliable information resources related to vaccines, giving correct information and giving information at the right time comes into prominence.

In the current study, the scores of the mothers were found to be higher than the scores of the fathers at a statistically significant level. Mothers particularly support vaccine hesitancy (Napolitano et al., 2018; Smith, 2017). Today, there are various factors pushing mothers toward this condition. Mothers' lack of information about child care, as well as groups and sharings on social media are among the top reasons (Aygün & Tortop, 2020; Wheeler & Buttenheim, 2013). Doing profound research prior to deciding on a vaccine is strongly related with the intention of getting a child vaccinated (Wheeler & Buttenheim, 2013). Considering that individuals usually shape their quest according to preexisting concerns and the personalized web site algorithms selectively predict what information a user desires to see based on their past clicking behavior and search history, the internet makes a broad contribution to vaccine hesitancy.

The study determined that the parents' number of children significantly affected the Vaccine Hesitancy Scale vaccine benefit and protective value subscales. Studies have reported that parents' number of children does not affect vaccine hesitancy (Aygün & Tortop, 2020). Although the literature has different reesra.ozkan@giresun.edu.trsults between the

number of children and vaccine hesitancy rates, there is a need for individual interventions for parents with vaccine anxiety (Salmon, Dudley, Glanz, & Omer, 2015).

In the present study, it was planned to collect the data via the face-to-face method. However, the data were obtained via phone calls due to the national lockdown during the pandemic, which posed a limitation to the study. The generalizability of the present study is limited, because the data were acquired during the COVID-19 pandemic and there were many factors affecting the course of COVID-19.

CONCLUSION

In the present study, most of the parents who did not get their children vaccinated had vaccine hesitancy, made the decision of not getting their children vaccinated after one vaccine or a few vaccines, had higher antivaccine scores and some of them had positive attitudes toward vaccine after the COVID-19 pandemic. The vaccine hesitancy was higher among the parents who had a higher level of education, the mothers and the parents with fewer children and the parents had experienced hesitancy for their children after a few vaccines.

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Conflict of Interest

The authors declare no conflicts of interest.

Author Contributions

Plan, design: HK, AS, MB, FS, FB; **Material, methods and data collection:** HK, FB; **Data analysis and comments:** HK, MB, FS; **Writing and corrections:** HK, AS, MB, FS, FB.

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Ethical Approval

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Ethical Behaviour in Search and Rescue: A Scale Development Research

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ABSTRACT
Objective: The aim of this study was to develop a measurement tool with proven validity and reliability to measure ethical behavior in search and rescue. **Materials and Methods:** The exploratory sequential mixed method was preferred in the study. The first stage started with a qualitative study to create the item pool. Interviews with 16 search and rescue personnel were conducted through semi-structured forms. 38 Items were created. The content validity of the item pool was evaluated through expert opinion. The Lawshe technique was used to evaluate expert responses. Afterwards, the item pool, which was subjected to language and spelling checks, was piloted with 10 participants. After necessary adjustments were made, the draft scale was administered to 330 personnel. **Results:** As a result of the analysis, the scale showed a unidimensional structure consisting of 10 items. The obtained scale was confirmed by confirmatory factor analysis. The reliability of the scale of ethical behavior in search and rescue was evaluated by Cronbach's Alpha and it was determined that the scale had high reliability and internal consistency with 0.95. **Conclusion:** The developed "Ethical Behavior in Search and Rescue Scale" can be applied to all individuals operating in the field of search and rescue.
Keywords: Search and Rescue, Ethics, Scale, Scale Development.

Arama Kurtarmada Etik Davranış: Bir Ölçek Geliştirme Çalışması

ÖZ
Amaç: Bu çalışmanın amacı arama kurtarmada etik davranışı ölçebilecek geçerliliği ve güvenirliliği ispatlanmış bir ölçme aracı geliştirmektir. **Gereç ve Yöntem:** Araştırmada keşfedici ardışık karma yöntem tercih edilmiştir. İlk aşama madde havuzunun oluşturulması için nitel çalışma ile başlatılmıştır. 16 arama kurtarma personeli ile yarı yapılandırılmış formlar aracılığı ile mülakatlar gerçekleştirilmiştir. 38 madde oluşturulmuştur. Madde havuzunun kapsam geçerliliği uzman görüşü ile değerlendirilmiştir. Uzman yanıtlarını değerlendirmede Lawshe tekniği kullanılmıştır. Daha sonra dil ve yazım kontrolüne tabi tutulan madde havuzu 10 katılımcıya pilot olarak uygulanmıştır. Gerekli düzenlemeler yapılan taslak ölçek 330 personele uygulanmıştır. **Bulgular:** Yapılan analizler neticesinde ölçek 10 maddeden oluşan tek boyutlu bir yapı göstermiştir. Elde edilen ölçek doğrulayıcı faktör analizi ile doğrulanmıştır. Arama kurtarmada etik davranış ölçeğinin güvenirliliğini Cronbach's Alpha değerlendirilmiş ve 0.95 ile ölçeğin yüksek güvenirliğe ve iç tutarlılığa sahip olduğunu belirlenmiştir. **Sonuç:** Geliştirilen "Arama Kurtarmada Etik Davranış Ölçeği" arama kurtarma alanında faaliyet gösteren bütün bireylere uygulanabilir.
Anahtar Kelimeler: Arama Kurtarma, Etik, Ölçek, Ölçek Geliştirme.

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INTRODUCTION

Disasters are events that occur suddenly and cause great damage and loss of life (Moore and Lakha, 2006). To cope with disasters, which are unpredictable and complex in nature, it is necessary to manage disasters successfully (GFDRR, 2016). Disaster management literature is replete with frameworks, models and procedures for coping with disasters (Nojavan et al. 2018). Perhaps the most common framework dominating the literature is the disaster management cycle, which includes the mitigation/prevention, preparedness, response and recovery phases (Coppola, 2011; Alexander, 2019). The cornerstone of the disaster management cycle is preparedness (Castillo, 2005). However, after disasters occur, events accelerate rapidly (Moore and Lakha, 2006; Moore, 2008; Coppola, 2011) and then multiple procedures can become constraining and challenging rather than enabling (Son et al., 2008). Intervention activities conducted at this stage play an important role in the management of the disaster management process (Fischbacher-Smith, 2014).

Response activities in disasters include search and rescue, health, food, religious, security, property and environmental protection, social and psychological support services (Holgersson et al. 2016; Jenkins, 2006). However, intervention phases within the traditional disaster management cycle also face various fundamental problems. During a disaster, people react differently according to their cultural characteristics, habits, preparations, beliefs, and often overreactions lead to failure (Pauchant and Mitroff, 1988). Weisaeth (1989). It is argued that during the response phase, search and rescue teams are often faced with extreme stress, an extremely challenging and chaotic environment and often hostile attitudes. Search and rescue teams mean a team consisting of professional personnel who can intervene in disasters and emergencies (Özkar, 2019; AFAD, 2023). Search and rescue teams, which interact directly or indirectly with disasters, play an active role in rescuing people safely and normalizing the flow of life that is delayed in case of a disaster. However, since search and rescue teams are the first to detect changes in the disaster victim's condition, they often face complex problems and challenges that occur in the unexpected situation (Battistuzzi et. al., 2021). Many of these problems and challenges are related to the lack of time, material and capacity in the dangerous, chaotic and pressure-filled conditions in which search and rescue teams must operate. For example, choices about where to concentrate rescue efforts, what risks to take, who to search for first, who should be rescued first, who should be left on hold, and how best to use limited resources are ethically challenging (Gustavsson et. al., 2020). Therefore, there are situations that require ethical decision-making processes in approaching disaster victims (Eryiğit et al., 2012; Gökkaya and Dinç, 2020).

Many researchers in the field of disaster ethics share the view that those most at risk should be prioritized (Merin et. al., 2010; O'Mathuna et. al., 2013). It is observed that behaviours such as approaching individuals waiting for rescue equally and fairly, respecting culture and values and human dignity, compulsory evacuation of the population, giving priority to disadvantaged groups, improving the environment, protecting social ties are among the ethical behaviours in disasters (Zack, 2009; Prieur, 2011; Bilgin, 2013). When a disaster or emergency occurs, the first ethical behaviour expected from search and rescue teams is to reach the scene quickly and start humanitarian aid activities by adhering to common ethical principles (Zack, 2009; Bilgin, 2013). However, researches show that the first condition for displaying correct ethical behaviours in search and rescue operations is to determine what needs to be done before the incident requiring search and rescue and to put them into practice through drills (Özbek, 2011). In addition, during search and rescue operations in any disaster or emergency, it is reported that publishing traumatic images of people directly on social media without filtering them, even with a well-intentioned approach, and reporting locations that will mislead search and rescue teams with malicious intentions are among the unethical approaches (Usta and Yükseler, 2021).

Although ethics has a great importance in terms of search and rescue activities, it is insufficient to address these two issues together in the literature. This may be due to the fact that this field is a specific field, difficulties in reaching the sample group and the difficulty arising from the handling of two different components together. Although there are some studies on ethical approaches to search and rescue activities, which are discussed in an extremely limited area in the literature, there is no measurement tool for ethical behaviours in search and rescue activities.

The aim of this study is to develop a scale of ethical behaviour in search and rescue. It is expected that the scale developed as a result of the study will be useful for public institutions and NGOs operating in the relevant field to select or evaluate search and rescue personnel.

MATERIALS AND METHODS

In this part of the study, the research model, stages of the study, scale item development process, research population, sample, expert opinions, pilot application and data analysis were explained in detail.

Study design

In this study, the exploratory sequential mixed method, which is one of the mixed method research projects, was used. This method involves collecting data through the qualitative method in the first stage to identify the current problem. The data obtained are mostly used to create an item pool for the development of a measurement tool (Creswell, 2021).

Table 1. Research process stages.

Sequence	Stages	Operation
1.	**Creating a substance**	Literature review to create a qualitative interview form
2.		Evaluation of the interview form with expert opinion
3.		Pilot application
4.		Semi-structured interviews
5.		Analysing the interviews
6.		Creation of the scale item pool
7.	**Theoretical analysis**	Obtaining expert opinion
8.		Language control
9.		Pilot testing
10.	**Psychometric analysis**	Sampling application
11.		Validity analyses
12.		Reliability analyses
13.		Scale naming and creating the final scale

In this study, first qualitative and then quantitative studies were conducted in accordance with the method. Scale development studies are basically completed in three different stages. These stages include item generation, theoretical analysis and psychometric analyses (Morgado et al., 2017). The activities conducted within the scope of the research are given in Table 1. In this scale development research, the principles determined by DeVellis (2017) for scale development were followed.

Qualitative phase

Qualitative research was first conducted to determine the items to be included in the scale of ethical behaviour in search and rescue to be developed within the scope of the study. The qualitative study was conducted in a phenomenological design since it was desired to determine the ethical problems experienced by search and rescue personnel and the sources that cause these problems (Patton, 2015). Interviews were used as a data collection method and the semi-structured form was used as a data collection form. The data obtained were managed without prejudice and interpretation.

Data collection instrument

Semi-structured interviews were conducted to determine the feelings, thoughts and ideas of search and rescue personnel regarding the ethical behaviour in search and rescue. In the interviews, ethical issues, problems and dilemmas encountered by search and rescue personnel during search and rescue in the field were analysed. The form used to collect data in the interviews was developed as a result of the literature review and consists of three parts. The first part consisted of 3 items containing information about the interview, the second part consisted of 6 items questioning the demographic information of the participants, and the third part consisted of 5 open-ended, semi-structured questions questioning the ethical problems encountered in search and rescue. As a result of the feedback and comments received from the specialists, necessary arrangements were made in the form and the form was finalised.

Sample and data collection process of the study

To select the people who can give the most accurate and best answer to the questions determined in the study, the sample was determined by purposeful sampling. In addition, to collect the most diverse answers to the research question, maximum diversity sampling within purposive sampling was preferred. In this context, data were collected through semi-structured interviews from 16 search and rescue personnel who met the sampling criteria and volunteered to participate in the research. Participants were informed about the study before the interviews and the process about the confidentiality of the data was explained. All interviews were audio recorded with the consent of the participants. Interviews continued until data saturation was achieved. It was determined that the data were repeated in the 14th participant. After interviewing 2 more participants to check data sufficiency, the interviews were completed. Nine of the interviews were conducted face-to-face and seven of them were conducted via online programs. The shortest interview lasted 21.18 minutes and the longest interview lasted 34.30 minutes ($\bar{x}$=25.40). In the interviews, the participant was expected to end the interview. However, it was ensured that the conversation did not get too distracted with interventions in conversations that could shift to off-topic or different areas.

Data analysis and findings

Qualitative data analysis was conducted through the data collection process (Maxwell, 2018). In data analysis, firstly, familiarity with the data was ensured by listening to the data obtained repeatedly. In this study, instead of transcribing the entire data, transcription was made on the voice recording. The voice recordings were listened to repeatedly and important points were noted, and the item formation process was conducted. While creating the draft item, the data obtained from the participants were used as much as possible without any interpretation. The statements of the participants were tried to be written directly as items. In addition, similar expressions stated by more than one participant were combined into a single item. From the data obtained from the

interviews, 38 draft items that can be used in the measurement tool were formed.

Quantitative phase

At this stage, the validity and reliability analyses of the scale item pool formed from the data obtained in the qualitative phase were carried out. Detailed information about each process is listed below.

Expert opinion for the item pool

The high content validity of the scales increases the success of that scale in measuring the construct to be measured at the same rate. The most practical way to achieve this is to apply for expert opinion. Expert opinion provides important information in terms of items that need to be corrected or deleted in the determined structure (Doğan & Doğan, 2019). In this context, the item pool created after the qualitative phase was first submitted to specialist opinion. During the specialist opinion process, 6 field specialists were consulted. All the specialists were PhD graduates, had previously conducted scale development studies and had research and publications on disaster and disaster management. During the process of obtaining specialist opinions, e-mails were sent to the field specialists explaining the purpose and method of the study and asking them to evaluate the scale items. The specialists were asked to evaluate the sent items in a triadic structure in accordance with the Lawshe technique as appropriate, should be corrected and not appropriate. In addition, they were asked to make explanations next to the items for the items that they stated to be corrected. The results obtained were evaluated in two stages in accordance with the Lawshe technique. In the first stage, for an item to remain in the scale pool, more than 50% of the specialists should mark the appropriate option for that item. When calculating this ratio, called the Coverage Validity Ratio (CVR), the formula $CVR = \frac{Nu}{N/2} = -1$ is used. In the next stage, the Content Validity Index (CVI) of the remaining items in the item Table 2**.** demographic characteristics of the participants

pool is calculated. CVI is calculated by dividing the average CVI of the remaining items in the pool by the number of items. CVI is determined as CVİ=$\frac{\sum CVR}{MS}$ (Lawshe, 1975). In this study, after the specialist evaluations, 17 items with CVR ≤0 were eliminated and the CVI of 21 items was evaluated. The CVI for 6 specialists is 0.99 (Alpar, 2020). Since the CVI values of the remaining 21 items were in the appropriate range, it was accepted that the content validity of the 21 items in the item pool was ensured.

Language check and pilot testing

Before the items were put into practice, an academic specialized in the field of grammar and literature was consulted to purify the items in terms of comprehensibility, punctuation, etc. Detected errors and marking mistakes were corrected. Before applying the scale to the determined sample, a pilot test was conducted in the form of an online form to 5 female and 5 male search and rescue personnel who met the sampling criteria. In this way, the access error that may occur in the online form or the incomprehensible, incomplete, erroneous points in the scale were checked for the last time. After the corrections made, the scale was ready to be applied to the sample.

Table 2. Data collection tools and data collection process.

Variable	Group	n	%
Gender	Woman	137	41.5
	Men	193	58.5
Age	18-22	113	34.2
	23-30	94	28.5
	30-40	105	31.8
	40+	18	5.5
Education Status	High school	39	11.8
	Associate degree	191	57.9
	Faculty	79	23.9
	Postgraduate	21	6.4
Type of Institution	Public	203	61.5
	Ngo	127	38.5
Marital Status	Married	145	43.9
	Single	185	56.1
Income	Low	97	29.4
	Middle	179	54.2
	High	54	16.4
Total		330	100.0

Sampling and data collection process

In this study, the purposive sampling method, which is one of the non-random sampling methods, was used. Data were collected from search and rescue personnel working in Türkiye for this purpose. The criteria for inclusion in the sample were determined as: volunteering to participate in the study and working

as search and rescue personnel. Deciding on the sample size has an important place in developing measurement tools. While some researchers state that 300 participants will be sufficient for scale development studies in general (DeVellis, 2017), some researchers state that 5 times the number of scale items (Hatcher, 1998) and some researchers state that 10 times the number of scale items should be reached (Akgül, 1997). In this study, data were collected from 330 search and rescue personnel to meet many different criteria in the literature (330/21=15.7). Table 2 presents the demographic information of the sample from which data were collected.

The data collection tool used in the quantitative data collection process consisted of three parts. The first part consisted of a demographic information form consisting of six questions questioning the demographic information of the sample, the second part consisted of the scale item pool containing 22 items created within the scope of the study, and the last part consisted of the scale of predisposition to ethical values used to determine the criterion validity of the scale. The scale of ethical behaviour in search and rescue created within the scope of the study was designed in as a 5-point Likert (1: Strongly Disagree, 2: Disagree, 3: Undecided, 4: Agree, 5: Strongly Agree). In the data collection process of the study, the online forms were sent to the people eligible for sampling via e-mail and social media tools. To reach a sufficient amount in this process, help was received from the managers of the organisations and team leaders working in disaster response. Within the scope of the research, the data collection process was conducted twice. Firstly, EFA analysis of the study was conducted with the data obtained at the end of the data collection process in which 330 participants participated. For the CFA of the scale created after the first stage, data were collected from 161 search and rescue personnel who met the inclusion criteria. The data were collected between 13.01.2024-13.02.2024. Since answering all questions and items in the data collection tool was compulsory, there was no missing data.

Data analysis

The data analysis of the study was conducted in three different stages: demographic data analysis, validity analyses and reliability analyses. Demographic data of the participants are presented in Table 2. Validity analyses consisted of content validity, normality test, EFA and CFA. Finally, Item Analysis, Alpha Coefficient (Cronbach's Alpha) tests were used in reliability analyses. SPSS 21 programme was used for Exploratory Factor Analysis (EFA), reliability analysis, etc. and AMOS 24 programmes were used for CFA.

Ethical considerations

The ethical permission required to conduct the study was obtained from the Kayseri University Scientific Research and Publication Ethics Board (dated: 09.10.2023, numbered: 74167). However, informed consent was obtained from all participants before the qualitative and quantitative study was initiated. The participants were informed that they may want to withdraw from the study and that their data would not be included in the study in line with their requests.

RESULTS

To determine the item distributions and dimensions created within the scope of the study, EFA should be performed. In this context, the data were analysed in terms of normality, missing data and sample size. Firstly, the normal distribution of the data obtained in the study was analysed. In this context, since the skewness and kurtosis values of the data were ±1.5, it was accepted that the data were normally distributed (Tabachnick & Fidell, 2013). When the data set was analysed, it was determined that there was no missing data. The suitability of the sample size for factor analysis was checked by Kaiser Meyer Olkin (KMO) test. For the sample to be adequate, the KMO value must be above 0.80. Bartlett Sphericity Test is used to determine whether the data collected within the scope of the study show diversity. The p value of the Bartlett's test should be less than 0.05 (Alpar, 2020). The KMO test of the data set obtained in this study was determined as .936 and the Bartlett Sphericity Test result was determined as $p<.000$. These values revealed that the data set was suitable for factor analysis.

In the factor analysis, "Principal Component Analysis" was preferred as the factor derivation method and "Direct Oblimin" as the rotation method. Rotation methods are basically divided into orthogonal and oblique rotations. Orthogonal rotations should be preferred in cases where no relationship between factors is expected, while oblique rotations should be preferred in cases where there is a relationship between factors. Oblique rotation is divided into Promax and Direct Oblimin. The Promax rotation method is preferred for analyzing large data. For these reasons, the direct oblimin method, which is the most appropriate rotation method, was preferred in this study (Tabachnick & Fidell, 2001). In factor analysis, item overlapping items and factor loadings were examined. Items with factor loadings below 0.33, overlapping items and items with a difference of less than .1 should be eliminated (Can, 2022). After EFA, since there were no overlapping items and items with factor loadings below 0.33, no item removal was performed. As a result of the EFA analysis, a structure consisting of 3 dimensions and explaining 71.30% of the total variance was formed. The factor structure obtained after EFA is presented in Table 3.

Table 3. Factor structure after EFA.

Item No	Items	Dimensions		
		1	2	3
2.	I give priority to babies and children in search and rescue even if it is more difficult and takes longer to rescu them. (reverse)			0.872
3.	In search and rescue, I give priority to the elderly, even if it is more difficult and takes longer to rescue ther (reverse)			0.906
4	I give priority to disabled people in search and rescue even if it is more difficult and takes longer to rescu them. (reverse)			0.917
6.	In search and rescue, I give priority to people with whom I have the same views (religious, political, etc even if it is more difficult and takes longer to rescue them. (reverse)		0.652	
12.	I do not share private images of disaster victims on social media.	0.847		
13.	I do not share special situations that I witnessed in search and rescue that would harm the personal privacy	0.861		
14.	I do not take unauthorised footage in search and rescue.	0.766		
15.	I am not engaging in search and rescue because of the smell of the bodies. (reverse)		0.901	
16.	I do not intervene in some disaster victims due to the risk of infectious diseases. (reverse)		0.860	
17.	In search and rescue, I act with my knowledge and experience, not with my emotions.	0.754		
19.	I consider intervention to disaster victims more important than my own health. (reverse)		0.523	
21.	I do not give information about search and rescue to the press without authorisation.	0.865		
22.	The beliefs of the people I search and rescue do not affect me.	0.874		
23.	The race of the people I search and rescue does not affect me.	0.857		
24.	The fact that the area where I do search, and rescue is in a foreign country does not affect my efforts.	0.823		
25.	I consider the cultural characteristics of disaster victims in search and rescue.		-0.75	
26.	I respect people's beliefs in search and rescue.	0.855		
27.	I act in accordance with the laws and rules of the region where I perform search and rescue.	0.774		
28.	In search and rescue, I avoid any practice that may harm disaster victims.	0.830		
31.	I deliver the valuables I find in search and rescue to the necessary units.	0.862		
32.	I respect the privacy of people in search and rescue.	0.874		

The item total correlation was analysed to determine the internal consistency of the scale structure. Item total correlation is important in terms of reliability. These data show the relationship between each item in the scale and the whole scale. In order not to damage the summability of the scales, it is necessary to pay attention that the item-total correlation cannot be negative or below .20 (Karagöz & Bardakçı, 2020). As a result of the analysis, 11 items with an item-total correlation below .20 were deleted. As a result of the item deletion process, a 10-item structure was reached. In this process, the item deletion process was conducted by deleting the item with the lowest value, then repeating the analysis and deleting the item with the lowest value again. The analysis process was finalised when there were no items with an item-total correlation below .20. The item-total correlation table of the formed scale is given in Table 4. The items in the new structure have a positive correlation between r=0.71 and r=0.84.

Table 4. Draft scale item-total correlation.

Item	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total score correlation	If item deleted Cronbach's alpha
Item13	37.61	65.437	0.827	0.946
Item14	37.76	66.632	0.726	0.950
Item17	37.82	66.974	0.721	0.951
Item22	37.68	64.867	0.839	0.946
Item23	37.71	64.710	0.834	0.946
Item24	37.75	65.522	0.780	0.948
Item27	37.79	66.245	0.752	0.949
Item28	37.68	65.840	0.815	0.947
Item31	37.56	66.345	0.813	0.947
Item32	37.68	64.181	0.848	0.945

Table 5. Finalised factor structure of the scale.

Item	Factor load
Item13	0.862
Item14	0.777
Item17	0.772
Item22	0.875
Item23	0.870
Item24	0.825
Item27	0.800
Item28	0.854
Item31	0.853
Item32	0.883

Since the deletion of the items in the factor structure obtained previously as a result of the item-total correlation analysis may change the factor structure, EFA was repeated. In EFA, the Principal Component Analysis was used as the analysis method and the Direct Oblimin method was used as the rotation method. Since there were no overlapping items and items with factor loadings below .33, no item removal was performed at this stage. The scale factor structure obtained after the last EFA is presented in Table 5. The new structure obtained was a single-factor structure explaining 70.22% of the total variance. In scale development studies, the total variance is required to be above 40% (Bursal, 2019). The variance value reached in this study was found to be sufficient, well above this value. The total variance explained of the developed scale is given in Table 6.

Table 6. Total variance explained.

Item	Initial eigenvalues			Total extraction of squared loads		
	Tot	% of varianc	Cumulative %	Total	% of variance	Cumulative %
1	7.022	70.224	70.224	7.022	70.224	70.224
2	0.593	5.935	76.159			
3	0.508	5.084	81.243			
4	0.479	4.786	86.029			
5	0.366	3.655	89.684			
6	0.291	2.911	92.595			
7	0.238	2.375	94.970			
8	0.181	1.810	96.779			
9	0.164	1.641	98.421			
10	0.158	1.579	100.00			

The scale structure formed as a result of the analyses was evaluated with CFA. To verify the obtained model, data were collected again from different participants suitable for the sample. Like the previous data collection process, data collection was conducted by sending the online form to the appropriate people via e-mail and social media applications. At this stage, a total of 161 participants were reached (161/10=16.1). In the CFA research, 57.8% of the participants were male, 33.6% were between the ages of 23-30, and 58.1% were search and rescue personnel working in the public sector. The Maximum likelihood calculation method was used due to the normal distribution of the data obtained. The model of the analysis is given in Figure 1.

In the CFA analysis of this study, r (X^2/df (chi-square/degree of freedom)=<5, Comparative Fit Index (CFI)=≥0.90, Goodness of Fitness (GFI)=≥0.85, Incremental Fit Index (IFI)=≥ 0.90, Turker-Lewis Index (TLI)=≥ 0.90, Root Mean Square Error of Approximation (RMSEA)=<0.10) values (Browne & Cudeck, 1989; Erkorkmaz et al, 2013; Kline, 2011). After the CFA process, it was determined that the data did not meet the goodness of fit values accepted in the literature. After this situation, item factor loadings were analysed first. However, since the item factor loadings were higher than <0.50 for all items, item removal was not performed. In the next process, modification indices of the model were analysed. Covariance was made between the items with the highest values. After the covariance, the analysis process was repeated, and the goodness of fit values were checked. This process was completed after the fourth covariance, and it was determined that the scale model reached the goodness of fit values. Specialist opinions were taken for the covariances

made and information was obtained about the accuracy of the process. After the procedures, the goodness of fit values of the scale model were determined as $X^2/df=3.343$, CFI = 0.975, GFI = 0.942, IFI = 0.975, TLI = 0.964 and RMSEA =<0.84.

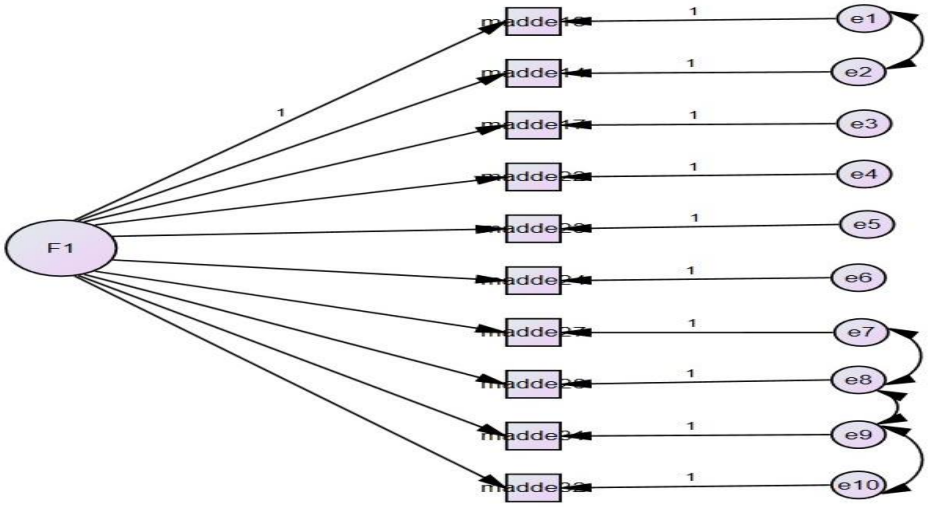

Figure 1. CFA diagram of ethics in search and rescue scale.

The Internal consistency (Cronbach's Alpha) test was performed to evaluate the reliability of the scale of ethical behaviour in search and rescue. A Cronbach's alpha value above 0.70 in scales shows high reliability (Can, 2022).

The Cronbach's alpha value of 0.95 indicates that the scale has high reliability and internal consistency (Table 7).

Table 7. Cronbach Alpha coefficient of the ethical behaviour scale in search and rescue.

Cronbach's alpha	Item number
0.952	10

The final version of the Ethical Behaviour in Search and Rescue Scale (EBSARS), for which validity and reliability studies were conducted, is presented in Table 8. The developed scale consists of one dimension and 10 items. The scale was designed in a 5-point Likert. The scale is designed in 5-point Likert type. It is scored in the range of Strongly Disagree (1), Strongly Agree (5). There are no reversely coded items in the scale. The highest score that can be obtained from the scale is 50 and the lowest score is 10. The scale can be applied to all individuals who perform search and rescue activities in any way, regardless of public, private or NGO.

Table 8. Finalized version of the EBSARS.

Sequence	Item Content	Strongly Disagree(1)	Disagree (2)	Undecided (3)	Agree (4)	Strongly Agree (5)
1.	I do not share special situations that I witnessed in search and rescue that would damage personal privacy.					
2.	I do not take unauthorised footage in search and rescue.					
3.	In search and rescue, I act with my knowledge and experience, not with my emotions.					
4.	The beliefs of the people I search, and rescue do not affect me.					
5.	The race of the people I search, and rescue does not affect me.					
6.	The fact that the area where I do search, and rescue is in a foreign country does not affect my efforts.					
7.	I act in accordance with the laws and rules of the region where I do search and rescue.					
8.	In search and rescue, I avoid any practice that may harm disaster victims.					
9.	I deliver the valuables I find in search and rescue to the necessary units.					
10.	I respect the privacy of people in search and rescue.					

DISCUSSION

The destruction caused by disasters, which can destroy the life streams of societies and cause high loss of life and property, causes many problems (AFAD, 2014; UNISDR, 2009). Search and rescue operations conducted from the first moment of disasters involve extremely difficult and severe conditions. This period brings extremely difficult psychological and physical conditions such as intense workload, witnessing many deaths and traumatic cases. These conditions have the possibility to affect the decisions of many employees working in the field. Failure of the personnel to act in accordance with ethical rules in search and rescue activities may lead to injury, death or a psychological problem that will cause great traumas for the disaster victim. Due to these situations, ethical behaviour of search and rescue personnel is important both for themselves and the disaster victim.

It is observed that studies in the field have focused on the use of robots or technology in search and rescue, factors affecting the success of search and rescue teams, or the psychological state of search and rescue teams (Drew, 2021; Öztürk & Kuday, 2024; Statheropoulos et al., 2015). However, there are no scale development studies in the field. The aim of this study is to develop a valid and reliable scale that can measure ethical behaviour in search and rescue. The exploratory sequential mixed method was preferred as a method to develop the intended scale. In this context, a qualitative study constituted the first phase of the research. In the qualitative study, semi-structured interviews were conducted with 16 search and rescue personnel. The qualitative interviews obtained were analysed and the

expressions that could be used as items in the scale were determined. In this process, care was taken to use the participant expressions without changing them as much as possible. As a result of the analysis, 38 draft items were formed.

The created scale item pool was submitted to expert opinion. The responses from the experts were evaluated with the Lawshe technique. At this stage, 17 items were deleted from the item pool. The remaining 21 items were first subjected to pilot application. Afterwards, it was checked for language and spelling. The item pool, which was found suitable for data collection, was applied to 330 participants consisting of search and rescue personnel, who met the sampling criteria. During the data collection process, 15.7 participants were reached for each item. In the analysis of the data, firstly, KMO and Bartlett tests were performed to determine the suitability of the scale for factor analysis. The tests showed that the data set was suitable for factor analysis. The item pool was subjected to EFA to determine the factor structure of the draft scale. The 21-item draft scale showed a structure consisting of 3 factors. To determine the internal consistency of this scale structure, the scale item-total correlation was analysed. In these analyses, 11 more items with negative or below .20 item-total correlations were removed from the scale and 10 items remained. The EFA repeated after the deletion of the items showed a unidimensional structure explaining 70.22% of the total variance.

CFA was conducted to verify the factor structure of the scale whose factor structure was determined by EFA. In this process, a new data collection process was conducted. For CFA, data were collected again for the 10-item scale from 161 participants who met the sample criteria consisting of search and rescue personnel. At this process, the number of participants per item was again above 15. In the CFA process, the necessary modification procedures were performed to fit the goodness of fit values of the model and the scale achieved goodness of fit values (x2/df=3.343, CFI = 0.975, GFI=0.942, IFI=0.975, TLI=0.964 and RMSEA=<0.84). As a result of the analyses, a single dimension "Ethical Behaviour in Search and Rescue" scale consisting of 10 items was obtained. The reliability of the scale was evaluated with Cronbach's Alpha. The Cronbach's Alpha value of the scale showed that it has a high reliability level with 0.95.

Limitations and Strengths

This study has some limitations. In qualitative research, the purposefulness of the sample from which data are collected and the size of the group from which data are collected are limitations. In addition to these, the data obtained in qualitative interviews are limited to what the individuals stated to the researcher and the knowledge and experience of the researchers were effective in evaluating the data. These situations show that the data obtained cannot be generalised. Another limitation is the application of the study in a specific culture. Using and analysing the scale in different cultures can improve the scale.

CONCLUSION

As a result of the analyses and evaluations made, the Ethical Behaviour in Search and Rescue Scale can provide a measurement and evaluation of possible ethical dilemmas that search, and rescue personnel may encounter during search and rescue activities.

As a result, the Ethical Behaviour in Search and Rescue Scale has a structure consisting of 10 items and one dimension. It is a valid and reliable tool that can measure ethical behaviour in search and rescue in Turkish culture. The scale is designed in a 5-point Likert. It is scored in the range of Strongly Disagree (1), Strongly Agree (5). There are no reversely coded items in the scale. The highest score that can be obtained from the scale is 50 and the lowest score is 10. The scale can be applied to all individuals who perform search and rescue activities in any way, regardless of public, private or NGO. A high score on the scale indicates that the person complies with ethical principles more, while a low score indicates that the person has adopted ethical principles sufficiently.

Conflict of Interest

On behalf of all authors, the corresponding author declares no conflict of interest.

Author Contributions

Plan, design: ÖD, EG; **Material, methods and data collection:** ÖD, EG; **Data analysis and comments:** ÖD, EG; **Writing and corrections:** ÖD, EG.

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Ethical Approval

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Posttraumatic Growth and Psychological Resilience in Young Adults Exposed to an Earthquake

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ABSTRACT

Objective: The present study aims to examine the factors affecting posttraumatic growth and psychological resilience in young adults who have experienced an earthquake. **Materials and Methods:** In the study, a total of 573 individuals who were affected by the earthquake between May and July 2023 participated in the study, sociodemographic characteristics form, Posttraumatic Growth Inventory (PTGI) and Brief Psychological Resilience Scale (BRS) were used in the study. **Results:** In the study, it was determined that the majority of the participants were women and more than half of them did not lose a first-degree relative in the earthquake. The average PTGI total score of the participants was 52.13±23.89, and the average BRS total score was 18.04±4.46. Between the PTGI and BRS scores was found positive correlation of the participants ($r=0.302$, $p<0.01$). As to the results of the regression analysis, gender, earthquake-related training and earthquake exposure were discovered to be important predictors of PTGI. Additionally, age, gender, marital status and earthquake-related training had a significant effect on BRS ($p<0.01$). **Conclusion:** The present study identified a bidirectional interactional process between PTGI and BRS, as well as a strong association between sociodemographic factors and PTGI.

Keywords: Earthquake, Posttraumatic Growth, Psychological Resilience, Young Adults.

Depreme Yakalanmış Genç Yetişkin Bireylerde Travma Sonrası Büyüme ve Psikolojik Sağlamlık

ÖZ

Amaç: Bu çalışma, depremi deneyimlemiş genç yetişkinlerde travma sonrası büyüme ve psikolojik dayanıklılığı etkileyen faktörleri incelemeyi amaçlamaktadır. **Gereç ve Yöntem:** Araştırmaya, Mayıs ve Temmuz 2023 tarihleri arasında depremden etkilenmiş toplam 573 birey katılmıştır. Araştırmada sosyodemografik özellikler formu, Travma Sonrası Büyüme Envanteri (PTGI) ve Kısa Psikolojik Dayanıklılık Ölçeği (BRS) kullanılmıştır. **Bulgular:** Çalışmada, katılımcıların çoğunluğunun kadın olduğu ve yarısından fazlasının depremde birinci derece yakın kaybı yaşamadığı belirlendi. Katılımcıların ortalama PTGI toplam puanı 52.13±23.89, ortalama BRS toplam puanı ise 18.04±4.46'dir. Katılımcıların PTGI ve BRS puanları arasında pozitif bir korelasyon saptandı ($r=0.302$, $p<0.01$). Regresyon analizi sonuçlarına göre, cinsiyet, depremle ilgili eğitim ve depreme maruz kalma PTGI için önemli belirleyiciler olarak tespit edildi. Ayrıca, yaş, cinsiyet, medeni durum ve depremle ilgili eğitimin BRS üzerinde anlamlı bir etkisi olduğu görüldü ($p<0.01$). **Sonuç:** Bu çalışma, PTGI ve BRS arasında çift yönlü bir etkileşim süreci olduğunu ve sosyodemografik faktörlerin PTGI ile güçlü bir ilişkiye sahip olduğunu ortaya koymuştur.

Anahtar Kelimeler: Deprem, Travma Sonrası Büyüme, Psikolojik Dayanıklılık, Genç Yetişkinler

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INTRODUCTION

Earthquakes are one of the most frequent natural phenomena in the world. In terms of their consequences, they cause the loss of many lives. In the 21st century, the number of earthquakes of magnitude 5 and above was recorded as 36.891 and approximately 732 thousand people lost their lives in these earthquakes (WHO, 2023). According to these data, an average of 1.603 earthquakes occur annually worldwide. Although not all earthquakes cause human casualties, earthquakes of higher magnitude are more destructive and may cause human casualties (PAHO, 2017).

In 2023, one of the most destructive earthquakes in the world was the earthquake with a magnitude of 7.7 on the Richter scale that occurred on February 6, 2023 at 04:17 in the morning in Kahramanmaraş, Turkey. The series of earthquakes shook Kahramanmaraş and 11 other neighboring cities, killing more than 50.000 people, and the region experienced three consecutive major earthquakes (Ünlügenç et al., 2023). It resulted in the destruction of the cities of Kahramanmaraş, Hatay and Adıyaman, especially their central settlements. Approximately 3 million people were directly affected by the earthquake. After the earthquake, hundreds of thousands of people had to leave their city of residence temporarily or permanently (UN, 2023). Such disasters not only cause physical damage in societies but also have long-lasting effects on individuals' psychological resilience and development (Şen, 2021). Although post-earthquake trauma studies have recently gained prominence, it is observed that these studies mainly focus on adults (Hatori & Prakash Bhandary, 2022). Moreover, it is stated that approximately 15% of the population in earthquake-stricken regions experience post-traumatic problems while young adults have a high potential to cope with these problems (Pistoia et al., 2018; Bell et al., 2017).

Earthquakes can cause feelings of panic and fear in individuals due to their severity and sudden occurrence. Furthermore, post-traumatic stress disorder (PTSD), which is a mental problem caused by natural disasters, has been the most studied and recorded problem (Wang et al., 2021). Rapidly changing mood states during and after disasters can disrupt individuals' psychological balance and lead to the emergence of post-traumatic stress symptoms. On the other hand, a growing body of research has found that individuals are affected by a variety of factors following life-threatening events or experiences of extreme stress, as well as subsequent adaptation problems (Smith & Pollak, 2020) Additionally, certain studies suggest that traumatic events can produce some positive outcomes (Guo et al., 2017; van der Velden et al., 2018). Studies focusing on positive psychological changes after traumatic events have increased and this situation was named Post Traumatic Growth by Tedeschi and Calhoun (1995). The concept includes positive changes in individuals when faced with trauma and changes such as perceived changes and growth in the self (Dell'osso et al., 2022). Some people may experience positive growth experiences after traumatic events. Therefore, posttraumatic growth and resilience can be considered synonymous (Smith et al., 2016). Resilience has rapidly gained prominence in the field of disaster mental health, with multiple studies substantiating the notion that resilient individuals demonstrate adaptive behaviors in morale, somatic health and social function following trauma (Chen et al., 2018; Lee et al., 2014; Seo & Lee, 2020). Furthermore, previous studies suggest that enhanced resilience could potentially mitigate feelings of helplessness in the face of setbacks (Duggal et al., 2016). The connections between PTG and resilience remain unclear (Amiri et al., 2021; Galatzer-Levy et al., 2018; Meng et al., 2018; Ueno et al., 2020). For example, Galatzer-Levy et al. (n=54 studies) conducted a trajectory analysis of resilience responses to major life stressors and potential trauma, which revealed that responses to potential trauma are largely shaped not only by the objective nature of the event but also by the personal characteristics and environmental stressors that individuals have before and after the event. In the meta-analysis conducted by Amiri et al. on earthquake survivors (n=21 studies), the findings indicated that individuals who had experienced an earthquake exhibited low levels of post-traumatic growth (PTG). In the same study, it was reported that post-traumatic growth (PTG) levels were higher in adults compared to children and adolescents. Additionally, PTG levels were observed to decrease over time following the traumatic event. In a two-wave longitudinal study by Ueno et al. (2020) on the development of resilience in Japanese adults, it was observed that while the mean values of resilience scores remained unchanged over the two-year period, significant differences were evident at the individual level. Furthermore, it was indicated that the resilience of individuals did not invariably increase with age; in some cases, it was observed to decline. The duration of the effects of traumatic events on individuals may differ for each person. Factors such as gender, education, faith and marital status can be influential (Tang et al., 2017). Both resilience and PTG are processes that follow adversity, and PTG is struggle procedure with the recognition of positive changes (Smith et al., 2016). Given that exposure to disasters, whether direct or indirect, frequently associates with adverse mental health outcomes, it becomes crucial to delve into the relationship between individuals' posttraumatic growth and psychological resilience, especially during this period of public health emergencies in Turkey.

Rapid identification and evaluation of the psychological impacts during a public health emergency can aid in deciding the direction of essential psychological support and inform public health strategies. Therefore, the present study aimed to examine the factors affecting posttraumatic growth and psychological resilience in individuals exposed to the February 6 earthquake.

MATERIALS AND METHODS

Study type

Conducted between May and July 2023, utilizing a descriptive-relational design, this study employed Google Forms for data collection.

Study group

Utilizing G*Power 3.1.9.7 software was used to determine the number of participants. Giving an effect size (d) of 0.3, a statistical power (1-β) of 0.95 and significance level (α) of 0.05, the established minimum sample size amounted to 196 participants. Ultimately, the statistical analysis encompassed 573 young individuals adults aged 18-40 (Walker-Harding et al., 2017). The study focused on young individuals residing in any of the 11 earthquake zones in Turkey that were severely damaged by the 6 February 2023 earthquake and still living in the region three months after the earthquake. In the study, potential participants were first selected through convenience sampling by inviting them to interviews through social networks (Twitter, WhatsApp, Facebook, Instagram, etc.). The study then used snowball sampling to find eligible participants. The survey was distributed over three months, and the sample was selected from people who had experienced the earthquake. All participants were given knowledge regarding the study's goals and the confidentiality of their responses before accessing the survey questions through Google Forms. Participants who agreed to participate were required to provide informed consent before proceeding to answer the survey questions, which were to be completed within a timeframe of 10-15 minutes.

Dependent and independent variables

The independent variables of this research are Age, Gender, Marital status, Education status, Place where the earthquake was experienced, Earthquake-related training, Loss of a relative in the earthquake, Status of the house after the earthquake. The dependent variable is the mean scores of Posttraumatic Growth and Psychological Resilience Scale.

Procedures

Adults exposed to an earthquake socio-demographic characteristics form, Posttraumatic Growth Inventory (PTGI) Scale and Brief Resilience Scale (BRS) Scale, prepared by the researchers in accordance with the literature, were used to collect data.

Sociodemographic Information Form

This form prepared by the researcher includes eight questions: gender, age, educational status, marital status, the location where the earthquake was experienced, whether the respondent received any training on earthquakes, The existence of immediate family members who perished in the earthquake and the condition of the respondent's house after the earthquake.

The Posttraumatic Growth Inventory (PTGI): The scale introduced by Tedeschi and Calhoun (1996) has a Cronbach's alpha value of 0.90. In the Turkish contex Kağan et al. (2012) conducted an assessment of this scale's validity and reliability, yielding the Cronbach's alpha value to be 0.83. The Post-Traumatic Growth Inventory (PTGI) consists of 21 items, scored on a 6-point Likert scale that ranges from 0 (no experience of change) to 5 (significant experience of change). The total score achievable on the scale varies from 0 to 105. High scores on the scale indicate that the person shows a high level of posttraumatic growth and development following a traumatic experience (Kağan et al., 2012). The sub-dimensions of the scale are: "positive change in self-perception (4, 10, 12, 19.), positive change in relationships with others (6, 8, 9, 15, 16, 20, 21), realization of new possibilities (3, 7, 11, 14, 17), change in belief system (5, 18.), and valuing life (1, 2, 3). The current study, the Cronbach's alpha coefficient of the Posttraumatic Growth (PTG) scale was found to be 0.94 for the overall scale, 0.80 for the subgroups of positive change in self-perception, 0.89 for positive change in relationships with others, 0.84 for realization of new possibilities, 0.71 for change in belief system, and 0.79 for valuing life.

The Brief Resilience Scale (BRS): Doğan (2015) completed the Turkish validation and reliability assessment of the scale developed by Smith et al. (2008) (Doğan, 2015). The Cronbach coefficient for the scale 0.83. This scale is structured in Likert-style with six items, each rated from 1 to 5. Importantly, items 2, 4, and 6 use reverse scoring, whereas the rest of the items are scored directly. Elevated cumulative scores on the scale correspond to heightened levels of psychological resilience. The Cronbach's alpha coefficient for the psychological resilience scale was calculated to be 0.71 in the current study

Statistical analysis

Data analysis was performed utilizing SPSS 25.0 software. Significance for the study was determined at $p<0.05$. Cronbach's α coefficient was used in the internal consistency analysis of the scales. The suitability of the research data for normal distribution was tested with Kolmogorov-Smirnov. Number, percentage, mean, standard deviation, spearman correlation and regression analysis were used to analyze the data.

Ethical considerations

Prior to initiating the study, ethical approval (2023-E.66404/64371) was secured from the Scientific Publishing and Ethics Committee at Şırnak University. The individuals who had experienced the earthquake survivors were informed with an explanation regarding the study's objectives, assurance of confidentiality, and the option to withdraw from participation at any point. The study adhered to the principles outlined in the Declaration of Helsinki. Besides, the earthquake survivors were asked to read the "Informed Voluntary Consent Form" and to check the box "I agree to participate in the survey voluntarily" if they agreed to participate in the survey.

RESULTS

In this section, the descriptive features of 573 young adult earthquake survivors who participated in the study and the variables of the Posttraumatic Growth and Brief Psychological Resilience scales are presented. Table 1

shows the descriptive characteristics of all individuals who participated in the study. The majority of the participants were female and the majority had not lost a first-degree relative in the earthquake (Table 1). 64.50% of the participants had an undergraduate or postgraduate degree and 71.20% were single. 86.40% reported that they experienced the earthquake at home, 64.70% reported that they did not receive any training on earthquakes, and 59.90% reported that there was no damage to their homes after the earthquake.

Table 1. Descriptive features of the participants.

Variables		n	%*
Sex	Female	389	67.90
	Male	184	32.10
Education status	1. Literate	14	2.40
	2. Primary school	23	4.00
	3. Middle school	23	4.00
	4. High school	144	25.10
	5. University and higher	369	64.50
Marital status	Married	165	28.80
	Unmarried	408	71.20
Place where the earthquake was experienced	At home	495	86.40
	At work	18	3.10
	Outside	14	2.40
	Other	46	8.10
Earthquake-related training	Yes	202	35.30
	No	371	64.70
Loss of a first-degree relative in an earthquake	Yes	28	4.90
	No	545	95.10
Status of residence after the earthquake	No damage	343	59.90
	Minimal damage	169	29.50
	Moderate damage	37	6.50
	Severe damage	16	2.80
	Demolished	8	1.30
		Mean	**SD**
Age		29.08	10.08
Total		**573**	**100.0**

In the present study, the mean score of the participants in PTGI subgroups were 10.13±5.17 for positive change in self-perception, 16.63±8.81 for positive change in relationships with others, 11.13±6.18 for realization of new possibilities, 6.39± 2.91 for change in the belief system, and 7.46±3.88 for valuing life, respectively. The mean PTGI total score of the participants was 52.13±23.89 and the mean BRS total score was 18.04±4.46 (Table 2). Between the mean PTGI and BRS scores of positive and weak correlation was found the participants (r= .302**, p<0.01) (Table 2).

Table 2. The Posttraumatic Growth Inventory (PTGI) and Brief Resilience Scale (BRS) scores of the participants and their correlation.

	Variables	Mean±SD	1	2	3	4	5		
1	**PTGI Overall**	52.13±23.89	-						
2	Positive change in self-perception	10.13±5.17	0.881**	-					
3	Positive change in relationships with others	16.63±8.81	0.913**	0.724**	-				
4	Realization of new possibilities	11.13±6.18	0.901**	0.770**	0.756**	-			
5	Change in the belief system	6.39±2.91	0.763**	0.667**	0.637**	0.589**	-		
6	Valuing life	7.46±3.88	0.770**	0.640**	0.605**	0.760**	0.592**	-	
7	**BRS Overall**	18.04±4.46	0.302**	0.300**	0.238**	0.267**	0.234**	0.223**	-

**Correlation is significant at the 0.01 level (2-tailed)

Table 3. Interpretation of the participants' descriptive features with PTGI and BRS regression analysis.

	Posttraumatic Growth					Psychological Resilience				
	Unstandardized Coefficients		Standardized Coefficients			Unstandardized Coefficients		Standardized Coefficients		
Model	**B**	**Std. Error**	**Beta**	**t**	**p**	**B**	**Std. Error**	**Beta**	**t**	**p**
(Constant)	50.270	14.814		3.394	0.001	11.829	2.726		4.339	0.000
Age	0.246	0.141	0.104	1.742	0.082	0.087	0.026	0.195	3.324	0.001
Gender	-8.852	2.135	-0.173	-4.146	0.000	1.741	0.393	0.182	4.430	0.000
Marital status	2.951	3.174	0.056	0.930	0.353	1.420	0.584	0.144	2.431	0.015
Education status	0.215	1.144	0.008	0.188	0.851	-0.160	0.211	-0.033	-0.761	0.447
Place where the earthquake was experienced	0.979	1.152	0.035	0.850	0.396	-0.233	0.212	-0.045	-1.097	0.273
Earthquake-related training	-4.239	2.103	-0.085	-2.016	0.044	-1.184	0.387	-0.127	-3.060	0.002
Loss of a relative in the earthquake	0.664	4.803	0.006	0.138	0.890	1.357	0.884	0.064	1.535	0.125
Status of the house after the earthquake	3.373	1.212	0.119	2.782	0.006	-0.343	0.223	-0.065	-1.539	0.124
	R=0.239[a] R Square=0.057 F=4.274 p=0.000					R=0.293[a] R Square=0.086 F=6.610 p=0.000				

B: unstandardized coefficients; Std Error: standard error; Beta: standardized coefficients; R^2: determination coefficient; F: ANOVA; $p<0.05$

Table 3 shows the factors affecting the participants' PTGI and BRS. The effect of the variables examined on PTGI and BRS was found to be significant at a level of $p<0.001$. The influence of qualitative data qualities on PTGI was examined and found to be R=0.239, R2= 0.057, 5.7% of the total variance in the PTGI dependent variable, and the result was statistically significant ($p<0.001$) (Table 3). The effect of characteristics related to qualitative data on BRS was determined and found to be R=0.293, R^2=0.086. A statistically significant outcome was found, indicating that these variables accounted for 8.6% of the total variance in the dependent variable BRS ($p<0.01$) (Table 3). Additionally, gender, earthquake-related training and status of being affected by the earthquake were observed to be significant predictors of PTGI. On the other hand, age, gender, marital status and earthquake-related training were found to have a significant effect on the BRS ($p<0.01$) (Table 3).

DISCUSSION

Various mental problems may be observed in individuals following traumatic stress in the aftermath of a catastrophic disaster such as an earthquake (Lee et al., 2014). Determination of protective factors to improve the well-being and psychological health of individuals is of vital importance in terms of public health (Song et al., 2021). When previous studies are examined, it is observed that the presence of psychological resilience in survivors after the devastating effects of the earthquake supports posttraumatic growth (Lee et al., 2014; Chen et al., 2019; Li & Hu, 2022). In the present study, it was discovered that the posttraumatic growth and psychological resilience levels of the individuals were low although three months had passed after the earthquake. Prior research has underscored the efficacy of conscious rumination interventions, particularly those conducted in the immediate aftermath of a traumatic event, in mitigating the adverse consequences of trauma and enhancing individuals' PTGI levels (Wang et al., 2019; Xu et al., 2022). For example, Garcia et al. found that mindful rumination contributed to PTG in 349 adult trauma survivors after the tsunami and earthquake that hit Chile on February 27, 2010 (Garcia et al., 2016). In the literature, PTGI and BRS have been measured at different time points since the earthquake. In a study conducted by Cao et al. with 1063 survivors of the Chinese earthquake 9.5 years after the earthquake, it was stated that posttraumatic growth was at a low level among the survivors (Cao et al., 2018). In the study conducted by Chen et al. with 122 individuals living in the region most affected by the earthquake after 12-18 months, it was emphasized that while the mean posttraumatic growth was high in the first year, the mean decreased significantly as time passed (Chen et al., 2015). Similarly, when the studies conducted in a similar manner were examined, it was found that the posttraumatic growth averages, which started high, decreased significantly after 1 year (Meng et al., 2018; Amiri et al., 2021; Xu & Liao, 2011). On the other hand, in the study conducted by XI et al. with 607 individuals three months after the earthquake, it was reported that the survivors showed moderate psychological resilience after the earthquake (Xi et al., 2020). Moreover, in several studies, it was determined that the psychological resilience levels of the survivors after the earthquake did not follow a regular course and there were temporal effects (Ueno et al., 2020; Galatzer-Levy et al., 2018; von Soest et al., 2018). This finding is consistent with previous research. Considering these results, it can be said that psychological resilience is significantly related to individual factors. In addition, PTGI may be related to the characteristics of the region of residence, sudden and large economic loss, and decreasing social support over time.

The study also revealed a significant positive correlation between posttraumatic growth and psychological resilience. Similarly, Li et al. reported a positive relationship between posttraumatic growth and psychological resilience in their study (Li et al., 2015). In addition, it was emphasized that individuals with high levels of psychological resilience can recover from trauma with less psychosocial damage, utilize effective coping mechanisms more, and so promote posttraumatic growth by boosting the experience of good change as a result of dealing with difficult life crises (Matheson et al., 2020; Aksu & İmrek, 2023; Matheson et al., 2020). In contrast, the current study found a strong positive association between all sub-dimensions of The Posttraumatic Growth Inventory and the Psychological Resilience Scale. In the literature, it has been stated that individuals with positive self-perception can cope with negative situations in a healthy way, and it has also been stated that individuals with negative self-perception are partially resistant to feedback about themselves and have difficulty in increasing their self-worth (Niveau et al., 2021). On the other hand, it has been emphasized in previous studies that the traumatized person displays a positive attitude in terms of empathy towards others, starts to make more effort and increases their belief and confidence that they are strong (Jung & Han, 2023; Niveau et al., 2021; Pratt et al., 2017). As a matter of fact, individuals who realize the value of life following trauma can create positive changes and live a better life since they are open to change in order to achieve the life they desire (Salawali et al., 2020).

As another finding in the present study, gender, damage to the residence and earthquake-related training emerged as significant determinants of PTGI. The present study revealed that the mean PTGI scores of males, those who did not receive earthquake

training, and those whose houses were not damaged were higher. Prior research has indicated that the impact of gender on posttraumatic growth is multifaceted. For instance, a recent investigation of earthquake survivors six years after the 2010 Yushu earthquake highlighted a notable discrepancy between genders in PTGI scores, with women reporting higher mean PTGI than men (Xie et al., 2020). However, the analysis conducted by Kesnold Mesidor (n=256) revealed no significant gender difference in PTGI mean scores among individuals exposed to the 2010 Haiti earthquake (Kesnold Mesidor, 2019). Furthermore, various studies have demonstrated that men's social, political, and economic influence can facilitate the development of post-traumatic growth (Chang, Yang, and Yu 2017; Dong et al. 2017). Furthermore, the PTGI model posits that the profound impact of traumatic events can fundamentally alter an individual's worldview (Tedeschi & Calhoun, 1996). For individuals lacking training in earthquake preparedness, an earthquake represents an unanticipated and unmanageable disruption. This unanticipated natural phenomenon prompts the individual to reassess their understanding of the world and their place within it. Such a shock can result in a more profound process of meaning-making among those lacking education, which may subsequently enhance their level of growth. Dell'Osso et al. posit that the unexpected nature of trauma facilitates the process of post-traumatic growth by expediting individuals' pursuit of meaning and value in their lives (Dell'osso et al., 2022). Furthermore, individuals lacking training may engage in more intense rumination following a traumatic event. In contrast, individuals with earthquake training may demonstrate a more limited capacity for meaning-making, whereas untrained individuals may engage in more profound reflection and attempt to comprehend the impact of the event (Buchholz, 2015). Conversely, it has been posited that those lacking earthquake training may exhibit heightened levels of PTG, contingent upon their ability to interact with a supportive network and articulate their experiences with those around them (Hao et al., 2023). Furthermore, the present study revealed that the absence of physical damage to living spaces after the earthquake was found to have a positive effect on individuals' posttraumatic growth processes. The ability to maintain the integrity of one's residence may confer a sense of security upon individuals, thereby enabling them to more effectively direct their attention toward the healing process by circumventing the need to address additional material concerns and traumas (Ozturk et al., 2023). As documented in the literature, the presence of a secure physical environment has been linked to feelings of safety, a diminished perception of trauma as a threat, and the promotion of growth through the reduction of anxiety levels (Kimberg and Wheeler, 2019). The results of this finding are consistent with the literature. When the literature is examined, it is stated that exposure to trauma depends on many factors such as the severity and duration of the event, gender, age, social, environmental and cultural factors, the number and proximity of losses, and the damage to the residence (Amiri et al., 2021; Chen et al. 2022; Jieling & Xinchun, 2017; Şenyüz et al., 2021; Jin et al., 2014). Therefore, PTGI in adults who have experienced a disaster can be considered as a key factor in predicting the recovery capacity of a community.

Finally, in the present study, age, gender, marital status and earthquake-related training were found to be significant determinants of BRS. These findings may be due to women's adherence to gender roles, expressing their emotions more than men, and socialization messages. Studies have emphasized that women reflect on traumatic life events more than men and tend to use emotion-focused coping more than men (Cohen-Louck, 2022). Because this process increases their social support, women are more likely to be accepted in the context of BRS (Prieto-Ursúa & Jódar, 2020). In addition, pre-earthquake education can help individuals be better prepared for the earthquake and reduce potential traumatic effects. Education can help individuals become more resilient after trauma by increasing both knowledge and coping skills (Yeon et al., 2020). A literature review revealed that age, marital status, gender, receiving disaster training and psychological support are associated with psychological resilience among post-earthquake survivors (Karairmak & Güloğlu, 2014; Mızrak & Tutkun, 2020; Mishra & Suar, 2012; Trip et al., 2018). On the other hand, the differences between the studies may be related to the severity of the earthquake and the characteristics of the regions.

The present study revealed that posttraumatic growth and psychological resilience levels were low in young adults three months after the earthquake. In the literature, no study was found to reveal the relationship between PTGI and BRS in earthquake survivors 3 months after the earthquake. Therefore, the results of this study are strongly representative of the post-earthquake period. In particular, it was observed that modifiable risk factors (such as receiving disaster training, features of the residence, psychological support) as well as non-modifiable factors (such as age, gender) significantly affected post-traumatic growth and psychological resilience levels. It is thought that these findings will be useful for psychological interventions and recovery processes after disaster-induced traumatic events. The results of this study are in line with the literature and may emphasize the importance of mental health studies to improve the health and well-being of the society.

The present study has certain limitations. The sample includes survivors from 11 earthquake-affected provinces in Turkey and therefore is not representative of all survivors of the February 6

earthquake. As the PTGI and BRS were administered through a self-report questionnaire, participants may have responded in a socially acceptable manner. Since the survey data was collected through an online tool, married or working individuals may have participated less due to their busy schedules. This may have resulted in overrepresentation of some groups such as women or single people. In addition, the study could not take into account participants' previous life events, previous losses and mental states. Further studies could employ a longitudinal study design to understand the impact of PTGI and BRS over time

CONCLUSION

The current study discovered that individuals affected by an earthquake and still residing in the affected area exhibited low average scores on both the Post-Traumatic Growth Inventory (PTGI) and the Brief Resilience Scale (BRS), with a positive correlation observed between the two measures. Sociodemographic characteristics of earthquake-affected individuals (gender, receiving earthquake-related training and being affected by the earthquake) were found to have an effect of 5.7% on PTGI. Age, gender, marital status, and earthquake-related training had an effect of 8.6% on psychological resilience. Based on these findings, it can be suggested that health professionals take into account the two-way interactional process between PTGI and BRS and consider it as an active and positive process that restructures individual lives in order to maintain better independent lives following trauma.

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Conflict of Interest

The author declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Author Contributions

Plan, design: MEŞ, MK; **Material, methods and data collection:** MEŞ, MK; **Data analysis and comments:** MK; **Writing and corrections:** MEŞ, MK.

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The Relationship between Occupational Accidents and Near-Miss Accidents and Occupational Safety Climate in a Metal Industry Workplace

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ABSTRACT
Objective: The aim of the research is to determine the relationship between occupational safety climate and occupational accidents and near-miss accidents in a workplace producing in the metal industry. **Material and Methods:** The cross-sectional study was conducted between 15 July and 30 August 2024 in an enterprise engaged in production in the metal sector in Balikesir province with a research group of 387 people. The dependent variables of the study are occupational accidents and near misses. **Results:** During their working lives, 37.2% of the participants had a near-miss accident and 34.1% had a work-related accident. The results of the multivariate logistic regression analysis showed that those who had a near-miss accident had low scores in the dimensions of Management Safety Priority, Commitment and Competence (OR: 0.56, CI: 0.38-0.82), Management Safety Justice (OR: 0.69, CI: 0.48-10), Workers' Safety Commitment (OR: 0.62, CI: 0.42-0.93), Workers' Safety Priority and Risk Non-Acceptance (OR: 0.40, CI: 0.27-0.61) and Safety Communication, Learning, and Trust in Co-Worker Safety Competence (OR: 0.65, CI: 0.45-0.94). According to multivariate logistic regression analysis, those who had a work accident had a significantly lower score on the dimension of Workers' Safety Priority and Risk Non-Acceptance (OR: 0.46, CI: 0.30-0.70). **Conclusion:** In the study, one in three people had a work accident or near-miss accident during their working life and the level of work safety climate was quite good. It was determined that the history of near miss accidents and work accidents was significantly related to the dimensions of occupational safety climate.
Keywords: Occupational Safety Climate, Near-Miss Accident, Work-Related Accident.

Metal İşkolunda Üretim Yapan Bir İşyerinde İş Kazası ve Ramak Kala Kaza Geçirme Durumunun İş Güvenliği İklimi ile İlişkisi

ÖZ
Amaç: Amaç: Araştırmanın amacı metal işkolunda üretim yapan bir işyerinde iş güvenliği ikliminin iş kazası ve ramak kala kaza geçirme ile ilişkisinin belirlenmesidir. **Gereç ve Yöntem:** Kesitsel tipteki çalışma 15 Temmuz-30 Ağustos 2024 tarihleri arasında Balikesir ilinde metal işkolunda üretim yapan bir işletmede 387 kişilik bir araştırma grubunda gerçekleştirilmiştir. Araştırmanın bağımlı değişkenleri iş kazası ve ramak kala kazadır. **Bulgular:** Katılımcıların çalışma yaşamları boyunca %37.2'si ramak kala kaza, %34.1'i iş kazası yaşamıştır. Çok değişkenli lojistik regresyon analizi sonuçlarında ramak kala kaza yaşayanların Yönetimin İş Güvenliği Taahhüdü ve Yetkinliği (OR: 0.56, GA:0.38-0.82), Yönetimin İş Güvenliği Adaleti (OR: 0.69, GA:0.48-10), Çalışanların İş Güvenliği Taahhüdü (OR: 0.62, GA:0.42-0.93), Çalışanların İş Güvenliği Önceliği ve Riski Kabul Etmemesi (OR:0.40, GA:0.27-0.61) ve Çalışanların İş Güvenliği İletişimi ve Yetkinliği (OR:0.65, GA:0.45-0.94) boyut puanları düşüktür. Çok değişkenli lojistik regresyon analizine göre iş kazası geçirenlerin Çalışanların Güvenlik Önceliği ve Riski Kabul Etmemesi boyutu puanı anlamlı olarak daha düşüktür (OR:0.46, GA:0.30-0.70). **Sonuç:** Araştırmada üç kişiden biri çalışma yaşamı boyunca iş kazası ve ramakkala kaza yaşamış olup iş güvenliği iklimi düzeyi oldukça iyidir. Ramak kala kaza ve iş kazası geçirme öyküsünün iş güvenliği ikliminin boyutları ile anlamlı düzeyde ilişkili olduğu belirlenmiştir.
Anahtar Kelimeler: İş Güvenliği İklimi, Ramak Kala Kaza, İş Kazası.

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INTRODUCTION

With the impact of neoliberal policies, industrialisation and technological developments, working life has undergone a significant transformation and this transformation has increased production and competition in the labour market (Celalettin Cevik & Ozkul, 2022; Kucukali & Ozmen, 2022). With the diversification of working life, working environments have become more dangerous and risky, so there has been an increase in occupational accidents, work-related diseases and occupational diseases (Takala et al., 2024). Despite significant improvements in occupational health and safety from the past to the present, occupational accidents and occupational diseases continue to be a global public health problem. According to International Labour Organization (ILO) global estimates, approximately three million workers die each year due to occupational accidents and occupational diseases and 395 million workers globally suffer a non-fatal occupational accident each year (International Labour Organization, 2024). Worldwide, occupational accidents and diseases cause the loss of approximately 4-5 per cent of the Gross National Product of countries (Shah & Mishra, 2024). According to ILO, an occupational accident is an event that occurs in the workplace or due to the execution of the work, which causes death or disability of the body integrity mentally or physically (International Labour Organization, 2011). Occupational accidents are also an important public health problem in Turkey and according to the Social Security Institution 2023 data, 681401 people in Turkey had occupational accidents and 1907 people died due to occupational accidents (Social Security Institution, 2023). Although there are various approaches to prevent occupational accidents, one of the most important ones is the determination of the probability of a near-miss event. Near-miss event is defined in the Regulation on Occupational Health and Safety Risk Assessment as 'an event that occurs in the workplace and has the potential to cause damage to the employee, workplace or work equipment but does not cause damage' and the determination of near-miss events is underlined (Çalışma ve Sosyal Güvenlik Bakanlığı, 2012b). Herbert W. Heinrich, in his study conducted in the late 1920s by examining 75000 industrial accidents, stated that 88% of occupational accidents were caused by unsafe behaviours, 10% were caused by unsafe conditions, 2% were unavoidable, and with the accident pyramid he put forward in 1959, he stated that every 300 unsafe behaviours caused 29 minor injuries and 1 major accident (Choudhry, 2014). As it is understood, to prevent occupational accidents, it is important to focus on unsafe behaviours and situations, and to identify and reduce near-miss accidents. This suggests the formation of an occupational safety climate and culture in working life.

Occupational safety climate aims to capture employees' perceptions of safety behaviours, policies, procedures and practices as well as managerial commitment and attitudes towards safety (Zohar, 2002). It is important to evaluate the occupational safety climate in the formation of occupational accidents and occupational accidents. In the literature, studies to determine occupational accidents and occupational diseases and near-miss accidents have been carried out by associating them with sociodemographic characteristics and working conditions (Arpat, 2015; Bingöl, 2010; Gokce, 2020). In the metal industry, which is one of the main production sectors in Turkey, there were 25081 work accidents recorded in 2023 and 36 workers lost their lives (Social Security Institution, 2023). According to the literature in Türkiye, there are studies evaluating the occupational safety climate in the metal industry and addressing the relationship between near miss accident and occupational accidents. For this reason, it is necessary both to determine the prevalence of occupational accidents and to reveal the relationship with occupational safety climate.

The aim of the research is to determine the relationship between occupational safety climate and occupational accidents and near-miss incidents in a workplace producing in the metal sector in Balikesir province centre.

MATERIALS AND METHODS

Study type

The cross-sectional study was conducted between 15 July-30 August 2024 in an enterprise engaged in production in the metal sector in Balikesir province.

Study group

The population of the study consisted of 1450 people and all blue-and white-collar employees in the enterprise were included. In the study, with a total universe population of 1450 people at 50% unknown prevalence, 5% deviation and 95% confidence level, the smallest sample size was calculated as 304 in Epiinfo 7.2. program (CDC, 2024), and 387 people who met the acceptance-exclusion criteria were reached by convenience sampling. Data collection was carried out by intermittently sending the questionnaire prepared in Google Forms to the workers via business e-mail, SMS and WhatsApp groups.

Dependent and independent variables

The dependent variables of the study are the status of experiencing occupational accidents and near-miss incidents. The independent variables are the sociodemographic characteristics of the employees, variables related to working life and the seven sub-dimensions of the NOSACQ-50 TR Occupational Safety Climate scale: Management Safety Priority, Commitment and Competence; Management Safety Empowerment; Management Safety Justice; Workers' Safety Commitment; Workers' Safety Priority and Risk Non-Acceptance; Safety

Communication, Learning, and Trust in Co-Worker Safety Competence; Workers' Trust in the Efficacy of Safety Systems.

Procedures

Data collection was carried out by sending the questionnaire prepared on Google Forms to the employees who volunteered to participate in the research, who were 18 years of age and over, who worked in the metal business line in Balikesir province, who could access the internet via mobile phone or computer, via business e-mail, SMS and WhatsApp groups. The questionnaire consists of sociodemographic characteristics, working conditions, NOSACQ-50 TR Occupational Safety Climate Scale.

Sociodemographic Characteristics Form: The form consists of questions prepared by the researchers in line with the literature such as age, gender, educational status, income status, health perception and working conditions, working environment. In addition, among these questions are the dependent variable of the research, the status of having an occupational accident and the status of having a near-miss accident (Kayabek & Cevik, 2022; Kines et al., 2011).

NOSACQ-50 TR Occupational Safety Climate Scale: The scale, developed by Kines et al. (2011) and adapted into Turkish by Cevik et al. (2024), consists of 50 items in total and a four-point Likert structure (strongly disagree, disagree, agree and strongly agree). The scale consists of seven sub-dimensions: Management Safety Priority, Commitment and Competence; Management Safety Empowerment; Management Safety Justice; Workers' Safety Commitment; Workers' Safety Priority and Risk Non-Acceptance; Safety Communication, Learning, and Trust in Co-Worker Safety Competence; Workers' Trust in The Efficacy of Safety Systems. The first three dimensions are related to employees' perception of safety management within the company and the other four dimensions are related to employees' perceptions of the work group. In the scale, questions 3, 5, 8, 9, 13, 15, 18, 21, 25, 26, 28, 29, 30, 31, 32, 34, 35, 41, 45, 47, 49 are reverse scored.

The scale score is obtained by calculating the average of the answers given to the questions for each dimension, and the higher the score obtained, the higher the occupational safety climate. The mean score of a single dimension in the scale below 2.70 indicates a low level of occupational safety climate and a great need for improvement, between 2.70 and 2.99 indicates a very low level of occupational safety climate and a need for improvement, between 3.00 and 3.30 indicates a very good level of occupational safety climate and only a slight need for improvement, and above 3.30 indicates a good level of safety climate. In the study in which the scale was developed, Cronbach's alpha values ranged between 0.79-0.85 in seven dimensions and between 0.85-0.93 in the adaptation study (C Cevik, Eroglu, Baydur, & Vurgun, 2024; Kines et al., 2011).

Statistical analysis

In the analyses, the number and the percentage distributions were presented for descriptive findings. In analytical findings, Mann-Whitney U test and Kruskal-Wallis analysis were applied in univariate analysis. Univariate analysis results are presented with Effect Size (ES) and significance levels. Multivariate logistic regression analyses were performed for the dependent variables of accident and near-miss accident. According to the results obtained from the univariate analysis in logistic regression analyses; age, gender and other significant variables and each dimension of the NOSACQ-50 TR scale were included in the model separately. The results obtained from the analysis models created for each dimension of the NOSACQ-50 TR scale are presented in the form of Odds Ratio and 95% Confidence Interval (OR (95% CI)). SPSS 27 and Jamovi 2.3.28 statistical package programs were used in the analyses.

Ethical considerations

Before the study was conducted, permission was obtained from the company and Balikesir University Health Sciences Non-Interventional Research Ethics Committee (Date: 04/06/2024, Approval No:2024/84).

RESULTS

91.9% of the participants were male and the mean age was 38.9±8.8 years. 26.9% of the participants were working between the ages of 33-39, 51.2% were high school graduates, 77.8% were married, 72.9% had children, 48.6% had an income equivalent to expenses, 53.2% had good general health perception, and 18.3% had chronic diseases (Table 1).

The average weekly working hours was 48.1±5.2, the average duration of experience in the current unit was 11.5±8.8 years and the average total working experience was 17.9±9.7 years. 78.6% of the employees were blue collar and 21.4% were white collar. 59.2% of the employees work in shifts, 45.0% work in production-assembly, 21.2% work in quality control-final operations and 11.4% work in maintenance-mechanical-infrastructure support unit. Of the participants, 4.4% were diagnosed with occupational disease, 37.2% had a near-miss incident, and 34.1% had an occupational accident (Table 1).

The participants' NOSACQ-50 TR Occupational Safety Climate scale Management Safety Priority, Commitment and Competence score average is 3.36 (95% CI: 3.30-3.41), the Management Safety Empowerment score average is 3.19 (95% CI: 3.13-3.25), the Management Safety Justice score average is 3.17 (95% CI: 3.11-3.23), the Workers' Safety Commitment average score is 3.20 (95% CI: 3.14-3.25), the Workers' Safety Priority And Risk Non-Acceptance average score is 3.06 (95% CI: 3.00-3.11), the Safety Communication, Learning, and

Trust in Co-Worker Safety Competence score average is 3.08 (95% CI: 3.02-3.14), the Workers' Trust in the Efficacy of Safety Systems average score is 3.32 (95%: 3.26-3.37) (Table 2).

Table 1. Sociodemographic and working life characteristics of the participants (n=387).

Variables	**n**	**%**
Age X±SD 38.9±8.8		
18-32	98	25.3
33-39	104	26.9
40-45	101	26.1
46-65	84	21.7
Gender		
Male	356	92.0
Female	31	8.0
Education level		
Primary education	4	1
High School	198	51.2
University	165	42.6
Master's degree	17	4.4
PhD	3	0.8
Marital status		
Married	301	77.8
Single	86	22.2
Having a child		
Yes	282	72.9
No	105	27.1
Income		
Income less than expenditure	144	37.2
Income equals expenditure	188	48.6
Income more than expenditure	55	14.2
General health perception		
Very bad	1	0.3
Bad	21	5.4
Centre	118	30.5
Good	206	53.2
Very good	41	10.6
Chronic illness		
Yes	71	18.3
No	316	81.7

n: Count, **X:** Mean, **SD:** Standard deviation.

Table 1 (Continued). Sociodemographic and working life characteristics of the participants (n=387).

Variables	**X**	**SD**
Weekly working hours	48.1	5.2
Duration of experience in the unit (years)	11.5	8.8
Working life (years)	17.9	9.7
	n	**%**
Status		
Blue-collar employee	304	78.6
White-collar employee	83	21.4
Mode of work		
Shifts	229	59.2
Overtime	158	40.8
Department worked in		
Human Resources-Occupational Health and Safety-Accounting-Finance	17	4.4
Engineering-Project-Design-R&D	34	8.8
Administrative Affairs	6	1.6
Planning-Logistics-Warehouse	10	2.6
Customer Service-Service-Purchasing-Information Processing	20	5.2
Production-Assembly	174	45.0
Quality Control-Final Operations	82	21.2
Maintenance-Mechanical-Infrastructure and support	44	11.4
Occupational disease		
No	370	95.6
Yes	17	4.4
Number of occupational disease cases (n=17)		
Yes, once	15	88.2
Yes, twice	2	11.8
Near-miss accidents in working life		
No	243	62.8
Yes	144	37.2
Number of near-miss accidents in working life (n=144)		
Once	63	43.8
Twice	41	28.5
3 times	17	11.8
4 times or more	23	15.9
Experiencing occupational accidents in working life		
No	255	65.9
Yes	132	34.1
Number of occupational accidents in working life (n=132)		
Yes, once	88	61.1
Yes, twice	39	27.1
Yes, 3 times	5	3.5

n: Count, **X:** Mean, **SD:** Standard deviation.

Table 2. NOSACQ-TR Occupational Safety Climate scale score distribution (n=387).

Dimensions of NOSACQ-50 TR	X (%95 C.I.)	Min-Max.
Management Safety Priority, Commitment and Competence	3.36 (3.30-3.41)	1.00-4.00
Management Safety Empowerment	3.19 (3.13-3.25)	1.00-4.00
Management Safety Justice	3.17 (3.11-3.23)	1.00-4.00
Workers' Safety Commitment	3.20 (3.14-3.25)	1.83-4.00
Workers' Safety Priority and Risk Non-Acceptance	3.06 (3.00-3.11)	1.43-4.00
Safety Communication, Learning, and Trust in Co-Worker Safety Competence	3.08 (3.02-3.14)	1.13-4.00
Workers' Trust in the Efficacy of Safety Systems	3.32 (3.26-3.37)	1.86-4.00

X: Mean, **C.I.:** Confidence Interval, **Min:** Minimum, **Max:** Maximum.

The univariate analysis of the NOSACQ-50 TR Occupational Safety Climate scale according to independent variables is presented in Table 3. Accordingly, the score of Management Safety Priority, commitment and competence are significantly low in the 18-39 age group (ES:0.16, p<0.01), shift workers (ES:0.17, p<0.01), those who have had a near-miss incident (ES:0.21, p<0.001), and those who have had an occupational accident (ES:0.14, p<0.05). The score of Management Safety Empowerment is significantly low in the 18-39 age group (ES:0.15, p<0.05), shift workers (ES:0.21, p<0.001), and those who have had an occupational accident (ES:0.13, p<0.05). The Management Safety Justice score is significantly lower in shift workers (ES:0.21, p<0.001), those who have had a near-miss accident (ES:0.16, p<0.05), and those who have had a work accident (ES:0.13, p<0.05). Workers' Safety Commitment score is significantly lower in shift workers (ES:0.17, p<0.01), and those who have had a near-miss accident (ES:0.16, p<0.01). The Workers' Safety Priority and Risk Non-Acceptance score is significantly lower in those who have had a near-miss incident (ES:0.25, p<0.001), and those who have had a work accident (ES:0.21, p<0.001). The score of Safety Communication, Learning, And Trust in Co-Worker Safety Competence is significantly lower in women (ES:0.37, p<0.001), shift workers (ES:0.21, p<0.01), those who have had a near-miss incident (ES:0.21, p<0.001), and those who have had a work accident (ES:0.13, p<0.05). The score of Workers' Trust in the Efficacy of Safety Systems is significantly lower in men (ES:0.23, p<0.05) and in the 18-39 age group (ES:0.13, p<0.05) (Table 3).

Table 3. The relationship between the sub-dimensions of NOSACQ-50 TR Occupational Safety Climate scale and sociodemographic characteristics (n=387).

Variables	D1	D2	D3	D4	D5	D6	D7
Gender (male-female)	0.01	0.07	0.06	0.13	0.09	0.37***	0.23*
Age (18-39/40-65)	0.16**	0.15*	0.10	0.05	0.02	0.05	0.13*
Education (high school and below/university)	0.06	0.06	0.01	0.03	0.03	0.11	0.05
Mode of work (shift/working schedule)	0.17**	0.21***	0.21***	0.17**	0.11	0.17**	0.06
Marital status (married/single)	0.07	0.06	0.05	0.14*	0.1	0.03	0.02
Having children (present/none)	0.06	0.07	0.05	0.08	0.1	0.07	0.01
Near-miss accident (no/yes)	0.21***	0.11	0.16*	0.16**	0.25***	0.21***	0.06
Work accident (no/yes)	0.14*	0.13*	0.13*	0.09	0.21***	0.14*	0.01
Status (blue collar/white collar)	0.05	0.04	0.12	0.02	0.13	0	0.01
Weekly working hours (under 45 hours-45 hours and above)	0.31	0.21	0.23	0.05	0.02	0.02	0.27
Years of employment (under 17 years - 17 years and above)	0.11	0.11	0.1	0.05	0.06	0.03	0.10

#: Effect Size (Rank biserial correlation coefficient) $0.1 \leq rrb < 0.30$ small effect size. $0.30 \leq rrb < 0.50$ medium effect size. $rrb \geq 0.50$ indicates large effect size. * p<0.05, ** p<0.01, *** p<0.001.

D1: Management Safety Priority, Commitment and Competence; **D2:** Management Safety Empowerment; **D3:** Management Safety Justice; **D4:** Workers' Safety Commitment; **D5:** Workers' Safety Priority and Risk Non-Acceptance; **D6:** Safety Communication, Learning, and Trust in Co-Worker Safety Competence; **D7:** Workers' Trust in The Efficacy of Safety Systems.

In the results of multivariate logistic regression analysis adjusted for age, gender and other variables found to be significant in univariate analyses, it was determined that those who experienced a near-miss incident had lower scores for Management Safety Priority, Commitment And Competence (OR: 0.56, CI: 0.38-0.82), Management Safety Justice (OR: 0.69, CI: 0.48-10), Workers' Safety Commitment (OR: 0.62, CI: 0.42-0.93), Workers' Safety Priority And Risk Non-Acceptance (OR: 0.40, CI: 0.27-0.61) and Safety Communication, Learning, and Trust in Co-Worker Safety Competence (OR: 0.65, CI: 0.45-0.94). Similarly, in the adjusted analysis results applied for work accidents, it was determined that only the Workers' Safety Priority and Risk Non-Acceptance dimension score was significantly lower in those who had a work accident (OR: 0.46, CI: 0.30-0.70) (Table 4).

Table 4. Logistic regression analysis results of the relationship between near misses and occupational accidents and NOSACQ-50 TR Occupational Safety Climate scale dimensions (n=387).

	Dimensions	**Near-miss accident#**	**Work accident#**
		OR (%95 CI)	**OR (%95 CI)**
D1	**Management Safety Priority, Commitment and Competence**	0.56 (0.38-0.82)**	0.75 (0.51-1.11)
D2	**Management Safety Empowerment**	0.80 (0.56-1.15)	0.80 (0.55-1.18)
D3	**Management Safety Justice**	0.69 (0.48-10)*	0.87 (0.59-1.27)
D4	**Workers' Safety Commitment**	0.62 (0.42-0.93)*	0.90 (0.59-1.36)
D5	**Workers' Safety Priority and Risk Non-Acceptance**	0.40 (0.27-0.61)***	0.46 (0.30-0.70)***
D6	**Safety Communication, Learning, And Trust in Co-Worker Safety Competence**	0.65 (0.45-0.94)*	0.94 (0.64-1.37)
D7	**Workers' Trust in the Efficacy of Safety Systems**	0.74 (0.50-1.09)	0.97 (0.65-1.44)

Results of logistic regression analyses adjusted for age, gender and variables found significant in univariate analysis.
***** p<0.05; ****** p<0.01; ******* p<0.001. **C.I.:** Confidence Interval.

D1: Management Safety Priority, Commitment and Competence; **D2:** Management Safety Empowerment; **D3:** Management Safety Justice; **D4:** Workers' Safety Commitment; **D5:** Workers' Safety Priority and Risk Non-Acceptance; **D6:** Safety Communication, Learning, and Trust in Co-Worker Safety Competence; **D7:** Workers' Trust in The Efficacy of Safety Systems.

DISCUSSION

The research is important in terms of determining the incidence of work accidents and near-miss incidents as well as revealing the relationship with the NOSACQ-50 TR Occupational Safety Climate scale. The study shows that 37.2% of the participants experienced at least one near-miss incident during their working life. In a study conducted by Arpat, similar to our study, the incidence of near-miss incidents was found to be 29% (Arpat, 2015). In another study conducted by Arpat and Ozkan in the cable manufacturing industry, it was reported that 27.0% of the participants experienced a near-miss accidents (Arpat & Ozkan, 2015).

In this study, 34.1% of the participants experienced occupational accidents in their working life. In the study conducted by Arpat et al. 28% of the participants had occupational accidents, which is similar to our study (Arpat, 2015). In another study conducted by Arpat and Ozkan in the cable manufacturing industry, it was reported that 37.5% of the participants were exposed to occupational accidents at least once during their working life (Arpat & Ozkan, 2015). In addition to these studies, a study conducted in Bursa province shows that the incidence of occupational accidents in enterprises belonging to the metal sector in the last 1 year is 15.5% (Bingöl, 2010). In this respect, it is seen that the accident frequency in our study is lower, given that it is evaluated throughout the working life. This situation may be due to the institutional structure of the company where the research was conducted and the fact that the study conducted in Bursa was conducted in different scales of companies. In fact, in the same study, it is seen that the accident frequency is approximately twice as high in very small-scale companies. When we look at the literature, it is seen that the frequency of occupational accidents in the main metal sector in Turkey was 4080 in 2009 and increased to 10710 in 2018 (Erin, Akın, & Alkan, 2023). In the relevant study, it is observed that the number of work accidents has increased especially as of 2012. This situation may be related to the fact that the outputs in working life became more visible with the enactment of the Occupational Health and Safety Law No. 6331 (Çalışma ve Sosyal Güvenlik Bakanlığı, 2012a).

In the study, NOSACQ-50 TR sub-dimension scores were found to be between 3.06-3.36 and it can be said that the level of occupational safety is at a good level. When we look at the studies conducted using NOSACQ-50 Occupational Safety climate in the literature; similar to our study, the safety climate level of low and high voltage workers in Iceland

(Eðvaldsson, 2018), the safety climate level of production workers of a factory in Indonesia are similar to our study (Prameswari & Cimera, 2023).

In our study, all dimension scores of NOSACQ-50 TR scores were at a good level. The mean score of dimension 1, which measures how employees evaluate management safety priority, commitment and competence, is 3.36, which is the highest dimension score. This indicates that employees' perception of management's commitment and competence towards safety is quite good. On the other hand, for the dimension 5, which assesses employees' commitment to safety; which covers workers' safety priority and risk non-acceptance, has a mean score of 3.06 and has the lowest dimension score, but it is still sufficient. Giving importance to safety before production is important in terms of ensuring that employees prioritize not exposing themselves to risky situations. In a study examining the safety climate level of forest workers in the USA, dimension 1 has a mean score of 3.40 and has the highest dimension score average (Lagerstrom, Magzamen, Kines, Brazile, & Rosecrance, 2019). In a study conducted with farmers in Italy, the range was 2.67-3.06, which is lower than our study, which may be related to the fact that it is a different group and the level of education is lower (Fargnoli & Lombardi, 2020). In addition, it is important to provide occupational health and safety trainings to employees periodically. Indeed, safety training has an impact on safety climate dimensions and safety climate has an impact on employees' perceptions of workplace safety (Alamoudi, 2022). For those working in the field of renewable energy in the USA, it ranges between 3.20-3.45 (Waller, 2023). This relatively high level may be related to the fact that the participants in the study, conducted in the USA, were employed in a sector where occupational health and safety trainings are more intensive.

In the results of multivariate logistic regression analysis, it was determined that those who experienced near-miss incidents had low scores in the dimensions of management safety priority, commitment and competence, management safety justice, workers' safety commitment, workers' safety priority and risk non-acceptance, and safety communication, learning, and trust in co-worker safety competence. it is important to reveal the relationship between occupational safety climate and near-miss accidents, which are among the important determinants of occupational accidents but there are problems with their recording. In addition, these significant variables are also related to increasing the occupational safety performance of management-employee communication (Alamoudi, 2022). In this respect, when occupational safety is provided by the management in the workplace and spread throughout the workplace, when employees prioritize the risk and exhibit an approach according to the risk, and when employees' communication and competence in occupational safety increase, the possibility of near-miss accidents will decrease. As a matter of fact, Lagerstrom et al. found that as the occupational safety climate increases, the number of employees reporting problems also increases (Lagerstrom et al., 2019).

According to the multivariate regression analysis, the score of workers' safety priority and risk non-acceptance dimension is significantly lower in those who have had a work accident. These findings show that employees' prioritizing safety and not accepting risk are related to the absence of occupational accidents. In a study conducted in Iran, it was revealed that job stress negatively affects the work safety climate and that safety climate is an important determinant in reducing accidents (Khoshakhlagh et al., 2021). Similarly, Christian et al. found that occupational safety climate is an important determinant in reducing accidents and injuries (Christian, Bradley, Wallace, & Burke, 2009). A study conducted in Saudi Arabia found that employee knowledge, motivation and participation are important.

In our study, the Workers' safety priority and risk non-acceptance sub-dimension of the Occupational Safety Climate is found to be related to the occurrence of both occupational accidents and accidents at work, which is important in terms of employee participation in risk management and increasing the awareness of employees.

In our study, the workers' safety priority and risk non-acceptance sub-dimension of the Occupational Safety Climate is found to be related to the occurrence of both occupational accidents and accidents at work, which is important in terms of employee participation in risk management and increasing the awareness of employees. As a matter of the fact, it is seen in the literature that being in balance with social environment contributes to occupational safety, reduces stress, and common occupational safety perceptions contribute to the development of work group norms in the workplace (Kines et al., 2011). In addition, in his meta-analysis study on safety climate, Clarke suggested that employees feel more connected to the work group rather than the organisation and that the perception of work group norms is highly determinant for group safety climate (Clarke, 2006).

Limitations and Strengths

The use of the NOSACQ-50 TR scale, which is a comprehensive and international measurement tool for safety climate measurement in our study, provides the opportunity to compare and infer our research results with similar studies conducted in other countries in the NOSACQ-50 database. In addition, it is a strength that it is conducted in a high-risk line of work and includes blue and white collar employees. It is also a unique aspect that it deals with occupational accidents and near-miss accidents in terms of occupational safety climate dimensions. However, the fact that the data of the study was

collected online, and convenience sampling method was used is a limitation in terms of generalizability.

CONCLUSION

One third of the participants had at least one near miss accident and occupational accident in their working life. The NOSACQ-50 TR occupational safety climate score of the research group was quite good. It was determined that occupational safety climate dimensions were significantly associated with near misses and occupational accidents. Recording near-miss accidents in the work environment and taking the necessary measures to be analysed will contribute to the prevention of occupational accidents. It is important to create and develop an occupational safety climate to prevent near-miss accidents. Workers' safety priority and risk non-acceptance should be given importance, their participation in decisions should be ensured and their awareness should be increased to prevent the occurrence of occupational accidents at the workplace. It is recommended to create and maintain a safety climate to prevent near-misses and occupational accidents in workplaces. It is also recommended to reveal the occupational safety climate and its determinants in other study areas.

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Conflict of Interest

The author declares no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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Ethical Approval

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Frequency of Roux Stasis Syndrome is Different in Uncut or Conventionel Roux-Y Procedures

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ABSTRACT

Objective: One of the main problems of conventional Roux-Y (C-RY) procedures is Roux stasis syndrome. To avoid this problem, an alternative technique called Uncut Roux-Y (U-RY) has been proposed in the literature. The aim of this article is to present the results of our patients who underwent C-RY and U-RY and to compare the incidence of Roux stasis between these two methods. **Materials and Methods:** The medical records of all patients who underwent C-RY and U-RY procedures at Manisa Celal Bayar University Department of General Surgery and Tepecik Teaching Hospital General Surgery Clinic between January 1989 and January 2018 were retrospectively reviewed. The incidence of Roux stasis in both procedures was investigated. **Results:** A total of 64 C-RY and 42 U-RY anastomoses were performed in 106 patients. Of the 64 C-RYs, 17 were performed for gastric cancer, 17 for bilienteric diversion, 25 for alkaline reflux gastritis and 5 for pancreatic pseudocyst. Of the 42 U-RYs, 18 were performed for gastric cancer, 18 for biliaryenteric diversion, 4 for alkaline reflux gastritis and 2 for pancreatic pseudocyst. A total of 38 complications occurred in 28 patients in the postoperative period. Roux stasis developed in 7 patients (14.1%) who underwent C-RY and 2 patients (4.8%) who underwent U-RY. There was no statistically significant difference in the development of Roux stasis between these two methods ($p>0.05$). **Conclusion:** The incidence of Roux stasis is lower in U-RY anastomosis compared to C-RY anastomosis. U-RY operation may be an effective method to prevent both duodenogastric reflux and roux stasis, especially in patients undergoing gastroenterostomy via omega loop. In addition, surgically, the U-RY technique is easier to perform than the C-RY technique. Therefore, U-RY operation is one of the techniques that can be preferred in laparoscopic or open gastroesophageal and biliary surgery.

Keywords: Roux-Y Stasis Syndrome, Uncut Roux-Y Limb, Conventionel Roux-Y Ans.

Roux Stasis Sendromunun Sıklığı Kesilmemiş veya Geleneksel Roux-Y Prosedürlerinde Farklıdır

ÖZ

Amaç: Konvansiyonel Roux-Y (C-RY) prosedürlerinin ana sorunlarından biri Roux staz sendromudur. Bu sorunu önlemek için literatürde Uncut Roux-Y (U-RY) olarak adlandırılan alternatif bir teknik önerilmiştir. Bu makalenin amacı C-RY ve U-RY yapılan hastalarımızın sonuçlarını sunmak ve bu iki yöntem arasındaki Roux staz görülme oranını karşılaştırmaktır. **Gereç ve Yöntem:** Ocak 1989 ile Ocak 2018 tarihleri arasında Manisa Celal Bayar Üniversitesi Genel Cerrahi Anabilim Dalı ve Tepecik Eğitim Hastanesi Genel Cerrahi Kliniği'nde C-RY ve U-RY prosedürleri uygulanan tüm hastaların tıbbi kayıtları retrospektif olarak incelendi. Her iki prosedürde Roux stazı görülme oranı araştırıldı. **Bulgular:** Toplam 106 hastanın 64'üne C-RY, 42'sine U-RY anastomozu uygulandı. 64 C-RY'nin 17'si mide kanseri, 17'si biliyerenterik diversiyon, 25'i alkalen reflü gastrit ve 5'i pankreatik psödokist nedeniyle yapıldı. 42 U-RY'nin 18'i mide kanseri, 18'i biliyerenterik diversiyon, 4'ü alkalen reflü gastrit ve 2'si pankreatik psödokist nedeniyle yapıldı. 28 hastada ameliyat sonrası dönemde total 38 komplikasyon meydana geldi. C-RY yapılan 7 hastada (%14,1) ve U-RY yapılan 2 hastada (%4,8) Roux stazı gelişti. Bu iki yöntem arasında Roux stazı gelişmesi açısından istatistiksel olarak anlamlı fark saptanmadı. ($p>0.05$) **Sonuç:** Roux stazı görülme oranı, U-RY anastomozunda C-RY anastomozuna göre daha düşüktür. U-RY operasyonu, özellikle omega loop üzerinden gastroenterostomi yapılan hastalarda hem duodenogastrik reflüyü hem de roux stazını önlemede etkili bir yöntem olabilir. Ayrıca cerrahi açıdan U-RY tekniğinin uygulaması C-RY tekniğine göre daha kolaydır. Bu nedenle U-RY operasyonu, laparoskopik veya açık gastroözofageal ve biliyer cerrahide tercih edilebilecek tekniklerden biridir.

Anahtar Kelimeler: Roux-Y Staz Sendromu, Kesilmemiş Roux-Y Prosedürü, Konvansiyonel Roux-Y Ans.

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INTRODUCTION

The conventional Roux-Y (C-RY) technique has been used in esophageal, gastric and hepatopancreatobiliary operations for many years. The main advantage of the Roux-Y operation is that it prevents bile and pancreatic secretion from reaching the gastric and esophageal mucosa. One of the main problems of this procedure is Roux stasis syndrome. This problem is seen in 20-40% after gastroesophageal surgery (Britton et al., 2005; Gustavsson et al., 1988; Hinder et al., 1988; Noh, 2000) and in 5-10% after biliary enteric diversion operations. (AbdelRafee et al., 2015; Bismuth et al., 1978; Stefanini et al., 1975). Therefore, an alternative technique called Uncut Roux-Y (U-RY) was proposed by Van Stiegman and Goff in 1988 (Van Stiegmann and Goff, 1988). In recent years, the U-RY technique has been used more frequently in laparoscopic gastric and esophageal surgeries compared to the C-RY technique (Park et al., 2018; Sun et al., 2018).

The aim of this article is to present the results of a total of 106 patients who underwent C-RY and U-RY in upper gastrointestinal and pancreatobiliary system surgery together with their surgical procedures and to compare the incidence of Roux stasis in these two methods.

MATERIALS AND METHODS

The medical records of all patients who underwent C-RY and U-RY between January 1989 and January 2018 at the Department of General Surgery of Manisa Celal Bayar University and the General Surgery Clinic of Tepecik Teaching Hospital were retrospectively analyzed. Age, gender, preoperative diagnosis, surgical procedure, morbidity and mortality were recorded. Patients were divided into 2 groups as U-RY (n=42) and C-RY (n=64) according to the type of anastomosis performed. The data obtained were transferred to IBM SPSS Statistics 21 program. The incidence of Roux stasis in both groups was compared by chi-square test. The limit of statistical significance was accepted as $p<0.05$.

Surgical method

For the U-RY procedure, the jejunum lumen was first occluded 30-35 cm distal to the ligament of Treitz. For this procedure, four or five seromuscular sutures (with 000 polypropylene or silk) were placed circularly on the jejunal wall and the suture material was tightly tied. A bilioenteric, gastrojejunal or esophagojejunal anastomosis was created at a site 5-7 cm distal to this jejunal occlusion site, either end to end or side by side. Approximately 25-30 cm distal to this anastomosis, a side-to-side jejunojejunostomy was performed to divert duodenal fluid (Figure 1-A). The 30-35 cm long jejunal segment lying distal to the ligament of Treitz, when passed anterior to the transverse colon, can easily access an anastomosis at the level of the porta hepatis or distal esophagus.

For the C-RY procedure, the jejunum was first cut 20-25 cm distal to the ligament of Treitz and the distal end was closed with 000 silk or polypropylene material. A bilioenteric, gastrojejunal or esophagojejunal anastomosis was created side by side or end to end 3-4 cm distal to the jejunal closure site. An end-to-side jejunojejunostomy was performed approximately 25-35 cm distal to this anastomosis (Figure 1-B).

Ethical considerations

Approval for this study was obtained from the Ethics Committee of Manisa Celal Bayar University Faculty of Medicine.

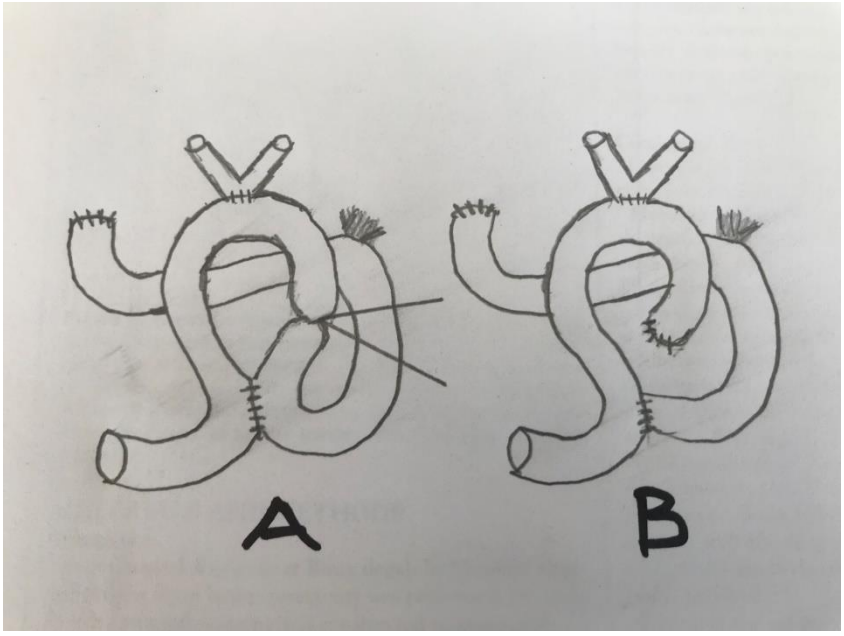

Figure 1. Gastrojejunostomy, A: Uncut Roux – Y, B : Conventionel Roux-Y.

RESULTS

In Of the total 106 patients, 64 (33 females and 31 males) underwent C-RY and 42 (23 females and 19 males) underwent U-RY procedures. The mean age of the patients was 57.1 years (range: 22-86).

Of our 64 patients, 17 underwent C-RY for gastric tumor, 25 for alkaline reflux gastritis, 17 for bilienteric diversion and 5 for pancreatic pseudocyst. Of our 42 patients, 18 underwent U-RY for gastric tumor, 18 for bilienteric diversion, 4 for alkaline reflux gastritis and 2 for pancreatic pseudocyst.

Of the gastric malignancies, 20 were localized in the gastric corpus (ten U-RY and ten C-RY) and 15 in the cardia (eight U-RY and seven C-RY). There were 18 patients who underwent total gastrectomy (twelve U-RY and six C-RY), 12 patients who underwent near-total gastrectomy (four U-RY and eight C-RY), and 5 patients who underwent distal esophagectomy and total gastrectomy (two U-RY and three C-RY). The locations of gastric malignancies and surgical treatments are shown in the table (Table 1).

Of the patients who underwent biliaryenteric diversion, 14 were malignant and 21 were benign. Of the malignant patients, 6 were gallbladder carcinoma and 8 were cholangiocarcinoma. Hepaticojejunostomy (one U-RY and two C-RY) was performed in 3 patients with gallbladder carcinoma after cholecystectomy and choledochal excision. In the other 3 irresectable gallbladder carcinomas, only biliary enteric bypass procedures (two U-RY and one C-RY) were performed to divert bile. 8 of our patients had cholangiocarcinoma. Tumor and extra hepatic biliary tree resection and biliary enteric diversion (three U-RY and one C-RY) were performed in 4 of them. The other 4 irresectable cholangiocarcinoma patients underwent only biliary enteric bypass procedure (one U-RY and three C-RY). 11 of the benign patients had late postcholecystectomic bile duct stricture. In 5 patients, the strictural segment of the bile duct was resected (two U-RY and three C-RY), while 6 patients with bile duct stricture underwent only proximal biliary enteric bypass procedures (three U-RY and three C-RY). 6 patients had intraoperative bile duct injury and underwent bile duct excision and hepaticojejunostomy (four U-RY and two C-RY). In 2 cases, there was obstruction at choledochoduodenostomy and bypass procedures were performed (one U-RY and one C-RY). In the other 2 cases, excision of the cysts and biliary tree and hepaticojejunostomy (one U-RY and one C-RY) were performed due to choledochal cysts. The diagnoses and surgical treatments of the patients who underwent bilienteric diversion are shown in the table (Table 2).

In our series, there were 29 patients with alkaline reflux gastritis (ARG), 25 patients underwent C-RY and 4 patients underwent U-RY procedure. The first operations of 25 C-RY patients with ARG were 13 distal gastrectomy-gastrojejunostomy, 8 truncal vagotomy-gastrojejunostomy and 4 truncal vagotomy-piloropilasty. Of the 4 ARG patients whose first operation was U-RY, 2 were truncal vagotomy gastrojejunostomy and 2 were truncal vagotomy pyloroplasty. 7 patients had pancreatic pseudocysts and underwent cystojejunostomy (two U-RY and five C-RY).

Mortality occurred in 4 patients (3.8 percent) in the postoperative period (three U-RY and one C-RY). Two of our patients with mortality had gastric cancer, the other two had gallbladder and biliary tree cancer. The causes of death were liver failure in two biliary tree patients and one pneumonia and one peritonitis due to duodenal stump failure in two gastric cancer patients.

A total of 38 complications occurred in 28 patients in the postoperative period. Enterocutaneous fistula developed in 4 patients (3.8%). The localization of the fistula was biliary anastomosis in 2 patients, esophagojejunostomy anastomosis in 1 patient and duodenal stump in 1 patient. All fistulas were treated conservatively.

11 patients showed signs of Roux stasis. C-RY was performed in 9 patients (14.1%) and U-RY in 2 patients (4.8%). The diagnosis of Roux stasis was made with clinical findings in all patients. Roux stasis syndrome was seen in 5 patients with alkaline reflux gastritis, 4 patients with gastric cancer and 2 patients after bilienteric diversion surgery. Patients with Roux stasis syndrome were treated conservatively (cessation of oral feeding, nasogastric decompression, parenteral fluids and electrolytes, and oral erythromycin suspension). The duration of this treatment ranged from two to seven days. The stasis episode recurred intermittently during a four-month period in patients who underwent gastric surgery. These patients were also treated conservatively. Endoscopic examination of these seven stasis patients with U-RY or C-RY did not reveal any anastomotic stenosis or jejunal ulcer. Two bilienteric diversion patients with C-RY anastomosis developed cholangitis. Magnetic resonance cholangiopancreotography (MRCP) showed no anastomotic stenosis or gallstones in the patients with cholangitis. These cholangitis crises recurred four times within three months and were treated conservatively. None of our patients with Roux stasis required surgical intervention. Chi square test was applied to the data transferred to the SPSS Statistics 21 program to compare the complication of Roux stasis in terms of two different anastomosis techniques. (The statistical significance limit was accepted as $p<0.05$.) The difference between the groups in terms of the development of Roux stasis was not statistically significant ($p=0.19$).

In addition, wound infection developed in nine patients, wound dryness in three patients, and pulmonary problems in seven patients and these were treated conservatively. The distribution of complications according to the technique applied is shown in the table (Table 3).

Table 1. Gastroesophageal tumors, localization and surgical treatment.

Localization of Tumor	Uncut Roux-Y	Classic Roux-Y
Gastric corpus cancer	8	10
Gastric cardia cancer	8	7
Gastric corpus carcinoid	1	-
Gastric corpus GIST	1	-
Total gastrectomy	12	6
Nearly-total gastrectomy	4	8
Distal esophagectomy and total gastrectomy	2	3

Table 2. Diagnosis and surgical technique in biliaryenteric divertion.

Diagnosis and operation	Uncut Roux-Y	Classic Roux-Y
Gallbladder Cancer (n=6)		
Resection	1	2
By-Pass	2	1
Cholangiocancer (n=8)		
Resection	3	1
By-Pass	1	3
Bileduct Stricture (n=11)		
Resection	2	3
By-Pass	3	3
Operative Bileduct Injuries (n=6)		
Resection	4	2
Occlusion - Choledochoduodenostomy (n=2)		
By-Pass	1	1
Choledochal cysts (n=2)		
Resection	1	1

Table 3. Postoperative complications.

Complications	Uncut Roux-Y	Classic Roux-Y
Postoperative death	3	1
Roux-stasis syndrome	2	9
Enterocutaneous fistulas	2	2
Wound infection	4	5
Wound dehiscence	1	2
Pulmonary problems	4	3

DISCUSSION

The most important problem of the C-RY technique is the Roux-Y stasis syndrome (Britton et al, 2005; Gustavsson et al, 1988; Hinder et al, 1988; Noh, 2000). This syndrome has been defined based on clinical criteria only. The symptoms of this problem are chronic abdominal pain, persistent nausea, intermittent vomiting worsened by solid or liquid food (Britton et al., 2005; Hinder et al., 1988; Noh, 2000; Zang et al., 2018). Several factors have been suggested to play a role in the development of Roux stasis syndrome. The most important role is the motility disorders of the traditional Roux anus (J. Y. Park & Kim, 2014; Y. S. Park et al., 2018; Sun et al., 2018). Altered motility of the Roux-Y anus may be responsible for Roux-Y stasis syndrome (Morrison et al., 1990; Tu et al., 1995). Roux stasis syndrome may occur due to the separation of the Roux anus from the natural small bowel pacemaker located in the proximal duodenum and the development of ectopic pacemakers in the proximal and middle part of the Roux limb after surgery (Karlstrom et al., 1989; Miedema, 1992; Morrison et al., 1990). These ectopic pacemakers generate new peristaltic waves in the oral direction and these retrograde contractions delay passage through the Roux anus and stasis (Karlstrom et al., 1989). The other factor is motility disorders of the gastric remnant after gastrectomy in which gastric pouch emptying is slowed in some cases (Britton et al., 2005; Gustavsson et al., 1988; Hinder et al., 1988; Noh, 2000). The higher incidence of Roux stasis syndrome after alkaline reflux gastritis surgery in our series may be due to motility disorder of the gastric remnant.

The addition of antrectomy and truncal vagotomy will make the gastric remnant atonic and this gastric pouch will impair the emptying of solid meals (Britton et al., 2005). According to some authors (Gustavsson et al., 1988; Sun et al., 2018), whether or not to perform vagotomy has no role in this. Another factor is performing afferent ans longer than 40 cm. Gustavsson et al. (Gustavsson et al., 1988) reported that the mean length of the conventional Roux-Y limb in patients with stasis was 41 cm, which was longer than 36 cm in patients without stasis.

Van Stiegman and Goff (Bismuth et al., 1978) proposed an alternative technique for Roux-Y construction in 1988. This operation is referred to as the uncut Roux-Y (U-RY) procedure. This method involves a loop gastro or esophagojejunostomy approximately 35-45 cm distal to the gastro or esophagojejunostomy and a side-to-side jejunojejunostomy. Afferent anuses are stapled proximal to the jejunojejunostomy and pancreatobiliary secretions are diverted through the jejunojejunostomy.

When the U-RY procedure is performed, normal jejunal peristalsis continues because neuromuscular continuity is maintained. Thus, motility disorders do not develop in the UR-Y limb and peristaltic waves in the oral direction do not occur (Miedema, 1992). Maintaining myoneural continuity between the duodenal pacemaker and the Roux limb may prevent Roux stasis syndrome (Kiciak et al., 2007; Zhang, 2006). Miedema et al. (Miedema, 1992) reported that stapler lines placed along the jejunal wall in dogs did not disrupt the myoneural continuity to the uncut Roux limb. Therefore, ectopic pacemakers are not seen in the uncut Roux-Y. Closure of the jejunal anus with staples or non-absorbable circular sutures does not interfere with the myoneural continuity between the duodenal pacemaker and the uncut Roux anus.

In the literature, it has been reported that the incidence of Roux stasis syndrome after U-RY is lower compared to

C-RY technique (Noh, 2000; Y. S. Park et al., 2018; Sun et al., 2018; Uyama et al., 2005; Yang et al., 2017). A recent meta-analysis (Sun et al., 2018) showed that the incidence of reflux gastritis or esophagitis, delayed gastric emptying and Roux stasis syndrome was statistically significantly lower in UR-Y operation. Some studies reported that the frequency of Roux stasis syndrome was lower in UR-Y compared to CR-Y, but this difference was not statistically significant (J. Y. Park & Kim, 2014; Park et al., 2018; Sah et al., 2020). In our series, the rate of Roux stasis was lower in UR-Y patients, but this difference was not statistically significant ($p>0.05$). The treatment of Roux stasis syndrome is usually conservative. The principles of this treatment are cessation of oral feeding, nasogastric decompression, intravenous fluids and some medications (metoclopramide, erythromycin, domperidone) (Britton et al., 2005; Hinder et al., 1988; Sun et al., 2018). The majority of patients recover with this treatment. However, severely symptomatic patients who do not improve with conservative measures are reoperated. In these cases, total or near-total gastrectomy is performed. Some studies (Britton et al., 2005; Hinder et al., 1988) have reported good results from this procedure. Therefore, U-RY procedures remain a preferred technique for gastroesophageal open or laparoscopic operations. (Ma et al, 2017; Noh, 2000; Sah et al, 2020; Tireli, 2012; Uyama et al, 2005; Wang et al, 2019; Yang et al, 2017; Zang et al, 2018) In our patients, recovery was achieved with conservative treatment and no patient required reoperation. For many years, hepaticojejunostomy with C-RY reconstruction has been used in many benign and malignant diseases. Cholangitis has been reported in 5-10% after this operation (AbdelRafee et al., 2015; Bismuth et al., 1978; Stefanini et al., 1975). Impaired intestinal motility at the Roux anus can lead to bile stasis and bacterial proliferation (Ducrotte et al., 1991; Vantrappen et al., 1977). This bacterial overgrowth in the Roux anus is a common and adverse event that causes cholangitis. Klaus et al. (Klaus et al., 2003) showed that the C-RY limb may be responsible for hepatic stasis, bacterial translocation and infection, leading to disruption of liver architecture in animals. Hepatic histomorphology in long-term survivors was found to be significantly better in U-RY looped animals compared to C-RY animals (Klaus et al., 2003). According to the findings in the literature, the U-RY technique prevents both motility disorders and bacterial overgrowth in the limb.

Klaus et al. (Klaus et al., 2003) studied small intestinal transit after biliodigestive anastomosis in rats using intravenous radioisotopes. They showed that large amounts of the isotope were retained in the liver and at the proximal end of the C-RY limb. This result was associated with microscopically more pronounced liver damage. Based on these findings, the authors stated that cholangitis and liver injury may develop after C-RY hepaticojejunostomy. Therefore, U-RY technique may be more beneficial than C-RY technique in terms of bile drainage and limb transit. In our series, cholangitis developed in two C-RY hepaticojejunostomy patients without gallstones or anastomotic stenosis. These patients were treated conservatively. None of our U-RY patients developed cholangitis. There are several reports of disruption of staple lines in animal models and human subjects undergoing U-RY surgery (Nguyen Tu and Kelly, 1995; Park et al., 2018; Tu et al., 1995; Uyama et al., 2005; Yang et al., 2017). The same authors achieved permanent closure of the Roux anus using a novel wingless six-row linear stapler (Ma et al., 2017; Uyama et al., 2005; Wang et al., 2019; Zang et al., 2018). For permanent closure of the jejunum, Noh (Noh, 2000) proposed four or five seromuscular sutures with polypropylene around the jejunal wall circumference and tied the suture tightly. He showed that there was no disruption of the occlusion line with this technique. This method permanently closed the jejunal lumen but did not disrupt the myoneural continuity of the jejunum. We and others (Jangjoo et al., 2010; Sah et al., 2020; Tireli, 2012) used the same closure technique in the operation. In our series, we found no disruption of the occlusion line of the jejunal limb in the endoscopic examination of eight patients with long-term survival. Noh (Klaus et al., 2003), Sah (Sah et al., 2020), Tireli (Tireli, 2012) and Jangio (Jangjoo et al., 2010) also reported the same findings.

Limitations and Strengths

Since our study was retrospective, our results are limited. Our sample size may not be sufficient for statistical results. In addition, the low survival time of the malignant hepatobiliary patient group in the study limited our long-term results.

CONCLUSION

The results of studies in the literature suggest that the U-RY technique may be more effective than the C-RY technique in preventing Roux stasis. The U-RY anus reduces the time required for closure of the jejunum by incision, the blood flow of the jejunum is not impaired, and this ensures that intestinal peristalsis is not damaged (Ma et al, 2017; Park and Kim, 2014; Park et al, 2014; Park et al, 2018; Sah et al, 2020; Sun et al, 2018; Wang et al, 2019). For these reasons, the U-RY technique continues to be a preferred technique in laparoscopic or open gastroesophageal and biliary surgery. (Kiciak et al, 2007; Ma et al, 2017; Noh, 2000; Sah et al, 2020; Sun et al, 2018; Wang et al, 2019; Yang et al, 2017; Zang et al, 2018; Zhang, 2006). The rate of Roux stasis in our series is similar to the literature. According to the results of our series, U-RY anastomosis may be more effective than C-RY anastomosis to prevent Roux stasis. In addition, we think that U-RY anastomosis is technically easier than C-RY anastomosis. Our results are limited by the retrospective nature of our study and the small number of patients. Large series, prospective randomized studies on the results of Uncut Roux-Y technique in upper gastrointestinal or bilioenteric anastomoses are needed.

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Conflict of Interest
The author declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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The Relationship Between Digital Literacy and Health Literacy in Individuals Aged 18-65

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ABSTRACT

Objective: The aim of this study is to examine the relationship between digital literacy and health literacy in individuals aged 18-65. **Materials and Methods:** A cross-sectional study was conducted between June and July 2023, with individuals aged 18-65 years applying to primary healthcare institutions affiliated with Agri Provincial Health Directorate. The Socio-Demographic Information Form, Health Literacy Scale, and Digital Literacy Scale were used to collect the research data. SPSS-25 package program was used. This study was conducted with 384 individuals. **Results:** According to the findings obtained in our study, the mean total score of the Health Literacy Scale was 102.27±17.34, and the mean total score of the Digital Literacy Scale was 64.39±12.75. Digital literacy level has a positive and significant effect on health literacy level (β= 0.581; t(382) =13.953, p=0.001). **Conclusion:** Digital literacy level has a positive and significant effect on health literacy level. It is recommended to provide training to increase the digital literacy levels of individuals or to broadcast public spots on social media platforms.

Keywords: Digital Literacy, Health Literacy, Technology.

18-65 YaşArası Bireylerde Dijital Okuryazarlık ve Sağlık Okuryazarlığı Arasındaki İlişkinin İncelenmesi

ÖZ

Amaç: Bu çalışmanın amacı 18-65 yaş arası bireylerde dijital okuryazarlık ve sağlık okuryazarlığı arasındaki ilişkiyi incelemektir. **Gereç ve Yöntem:** Araştırma kesitsel tipte olup Agri İl Sağlık Müdürlüğü'ne bağlı birinci basamak sağlık kuruluşlarına başvuran 18-65 yaş arası bireylerle Haziran-Temmuz 2023 tarihleri arasında yürütülmüştür. Araştırma verilerinin toplanmasında Tanıtıcı Bilgi Formu, Sağlık Okuryazarlığı Ölçeği ve Dijital Okuryazarlık Ölçeği kullanılmıştır. SPSS-25 paket programı kullanılmıştır. Bu çalışma 384 kişi ile gerçekleştirilmiştir. **Bulgular:** Çalışmamızda elde edilen bulgulara göre, Sağlık Okuryazarlığı Ölçeği toplam puan ortalaması 102,27±17,34, Dijital Okuryazarlık Ölçeği toplam puan ortalaması 64,39±12,75'dir. Dijital okuryazarlık düzeyinin sağlık okuryazarlığı düzeyi üzerinde pozitif ve anlamlı bir etkisi vardır (β=0.581; t (382) =13.953, p=0.001) **Sonuç:** Dijital okuryazarlık düzeyinin sağlık okuryazarlığı düzeyi üzerinde pozitif ve anlamlı bir etkisi vardır. Bireylerin dijital okuryazarlık düzeylerinin artırılması için eğitimler verilmesi veya sosyal medya platformlarında kamu spotları yayınlanması önerilmektedir.

Anahtar Kelimeler: Dijital Okuryazarlık, Sağlık Okuryazarlığı, Teknoloji.

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INTRODUCTION

Today's world includes thousands of symbolic expressions along with the written symbols we use to communicate. Including some meanings and expressions in the symbols used is a form of reading. There is a relationship between the level of literacy and the level of health literacy that should not be ignored. Individuals who are illiterate or have insufficient literacy levels cannot be expected to have high levels of health literacy (Üçpunar et al., 2021). On the other hand, high literacy levels of individuals do not mean that the level of health literacy is sufficient (Bükecik & Adana, 2021). Health literacy has recently emerged as a key concept that combines literacy and health concerns. Although definitions are highly controversial, health literacy can be recognized in the simplest way as "the skills required to access, understand and use the information for health" (Stormacq et al., 2023).

Today's health system is quite complex in terms of the services it provides to people. Health literacy has become increasingly important with the prolongation of life expectancy with developing technologies, the application of new treatment methods, and the increase in chronic diseases and obesity (Durusu Tanrıöver et al., 2014). Health literacy has become an increasingly important concept in the health sector due to the effective use of existing health services, the results obtained from the services received, and the reduction of health expenditures (Marinucci et al., 2023). It is seen that the success of health services and achievement of targeted results are related to the individual's health literacy level. Health literacy, which started to gain importance in the USA towards the end of the 20th century, has gained importance in the European Union countries where health literacy has low levels through research. As a result of a recent studies conducted in Turkey, it was found that the level of individual health literacy is not sufficient (Aboumatar et al., 2013; Callahan et al., 2013; Kaphingst et al., 2014).

A common assumption popular media and educators adopted is that young people have higher competence with Information Communication Technologies (ICT) than older people. However, in previous research, there is limited information about the relationship between age and ICT competence (Temel & Aras, 2017; Wells, 2023).

When the concept of "digital literacy" first appeared in the world in the late 1990s, Gilster (1993) defined it in educational terms. "Digital literacy is the student's capacity to use specific information skills applied to text and multimedia information found on the Internet or in a school-based learning context." It is clear that digital literacy goes beyond the basic literacy skills of reading, writing, listening, and speaking. With today's digital media and technologies, people can create content, work, share, socialize, research, play games, collaborate, communicate, and learn.

Since Gilster's initial concept of digital literacy, the term has evolved, changed and expanded, becoming increasingly central to cultural, civic, and economic participation (Toçi et al., 2015). With the advent of Web 2.0 tools, a participatory culture has emerged that requires skills to express, create, share, interact, and engage in activities far beyond the initial digital literacy vision (Sørensen et al., 2012). However, with its expanding definition, digital literacy has become what Chase and Laufenberg (2011) call "inherently squishy". Definitions of the term range from simply technology fluency to broader, more complex conceptual frameworks that encompass a broad spectrum from the ability to apply information literacy skills (e.g. organizing, managing, presenting, and evaluating information) in digital environments. In this direction, it was aimed to examine the relationship between digital literacy and health literacy in individuals aged 18-65.

Research questions

- What is the level of digital literacy among individuals aged 18-65?
- What is the level of health literacy among individuals aged 18-65?
- Is there a significant relationship between digital literacy and health literacy in individuals aged 18-65?

MATERIALS AND METHODS

Study design

The cross-sectional study was conducted between June and July 2023, with individuals aged 18-65 years applying to primary healthcare institutions affiliated with Agri Provincial Health Directorate.

The target population of the research was composed of primary healthcare institutions affiliated with Agri Provincial Health Directorate. In the study, it was tried to reach all individuals without using the sampling method. In our study, a total of 384 individuals were selected through a random sampling method. All individuals applying to primary healthcare institutions affiliated with Agri Provincial Health Directorate and volunteering to participate in the study were included. At the end of the study, in the post hoc power analysis conducted in line with the results obtained from 378 participants, the power of our study was calculated to be 99% at the 95% confidence level at the medium effect size (Cohen, 1988). The STROBE guidelines were used in the reporting process of this research article (Von Elm et al., 2007).

Data collection tools

A Socio-Demographic Information Form, Health Literacy Scale, and Digital Literacy Scale were used to collect research data.

Socio-Demographic Information Form: It consists of questions (age, gender, marital status, monthly income level etc.) formed by the researchers in line with the literature (Callahan et al., 2013; Toçi et al., 2015; Üçpunar et al., 2021) and containing the sociodemographic characteristics of the individuals.

The Health Literacy Scale: Aras and Temel (2017) tested the validity and reliability of the health literacy scale, which was developed by Sorensen (2012) and simplified by Toci, Bruzari, and Sorensen (2015) by reworking the 47-item Health Literacy Survey in Europe (HLS-EU) form. The health literacy scale consists of 25 items and four sub-dimensions. Access to information sub-dimension includes five items (1-5th), the lowest score to be obtained from this sub-dimension is 5 and the highest score is 25. The information comprehension sub-dimension includes seven items (6-12), the lowest score to be obtained from this sub-dimension is 7 and the highest score is 35. Appraisal/ Evaluation sub-dimension includes eight items (13-20), the lowest score to be obtained from this sub-dimension is 8, and the highest score is 40. The Application/Using sub-dimension also includes five items (21-25), the lowest score to be obtained from this sub-dimension is 5, and the highest score is 25. For the whole scale, the lowest score is 25 and the highest score is 125. The items in the scale are answered by the participants on a 5-point Likert scale as "5: I have no difficulty at all, 4: I have little difficulty, 3: I have some difficulty, 2: I have a lot of difficulty, 1: I am unable to do it / I have no ability / impossible". All items of the scale are positive and there are no reverse items. The standard deviation of the original scale was 0.95 and the internal consistency coefficients determined for its subscales ranged between 0.90 and 0.94. Low scores indicate that the health literacy status is inadequate, problematic, and poor, while high scores indicate that it is adequate and very good. As the score obtained from the scale increases, the health literacy level of the individual increases (Aras & Temel, 2017).

The Digital Literacy Scale: Developed by Ng (2012), which was translated into Turkish by Hamutoğlu et al. (2016), consists of 17 items. Scale items were answered by the participants as "5: Strongly agree, 4: Agree, 3: Undecided, 2: Disagree, 1: Strongly disagree" on a 5-point Likert scale. All items of the scale are positive, there are no reverse-scored items. The scale has four sub-dimensions: Attitude, Technical, Cognitive, and Social. There are 7 items (1-7) in the Attitude sub-dimension, the lowest score that can be obtained from this dimension is 7 and the highest score is 35. There are 6 items (8-13) in the technical dimension. Therefore, the lowest score that can be obtained from this dimension is 6 and the highest score is 30. There are 2 items (14-15) in the cognitive sub-dimension. Therefore, the lowest score that can be obtained from this dimension is 2 and the highest score is 10. Similarly, since there are 2 items (16-17) in the social dimension, the lowest score that can be obtained from this dimension is 2 and the highest score is 10. The minimum score for the whole scale is 17 and the maximum score is 85. The standard deviation of the original scale is 0.89 and the internal consistency coefficients determined for the subscales vary between 0.79 and 0.98. The lower scores obtained from the sub-dimensions of the digital literacy scale and the overall scale indicate insufficient / low digital literacy level, while the higher scores indicate high digital literacy (Ng, 2012).

Statistical analysis

IBM SPSS V-25 program was used in the statistical analysis of the study. Data security and confidentiality were provided. Necessary normality tests were performed in the process of analyzing the data and it was understood that the data showed normal distribution (kurtosis and skewness -1.5 to +1.5) (Tabachnick & Fidell, 2013). Simple linear regression analysis was used. A p value of <0.05 was considered statistically significant.

Ethical consideration

In advance of initiating the research endeavor, necessary approvals were obtained through due diligence from the Agri Ibrahim Cecen University Scientific Research Ethics Committee (Date: 25.05.2023, Approval no: 120). Furthermore, written authorizations were procured from the institutions acting as the operational contexts for this study. With unwavering transparency, the research's aspirations were communicated, harmonizing seamlessly with the ethical precepts encompassing 'Confidentiality and Protection of Confidentiality,' 'Respect for Autonomy,' and the overarching principle of 'Do No Harm/Benefit.' The realization of these ethical tenets was ensured through the enrollment of participants who volunteered to partake, thus upholding their autonomy.

RESULTS

In our study, it was found that 71.4% of the individuals were female, 91.1% were single, 75.0% were nuclear family, 52.6% were higher education graduates, 46.6% had income less than expenditure, 93.5% had no chronic disease, and 52.1% had a family history of chronic disease (Table 1).

The mean age of the individuals was 22.68±4.48, the mean total score of the Health Literacy Scale was 102.27±17.34, the Access to Information Subscale was 20.55±4.05, the Understanding Subscale was 29.06±5.28, the Appraisal/ Evaluation Subscale was 32.50±5.94, and the Application/ Utilization Subscale was 20.16±3.82 (Table 1).

The mean total score of the Digital Literacy Scale was 64.39±12.75, Attitude Subdimension 27.15±5.54, Technical Subdimension 22.41±4.99, Cognitive Subdimension 7.60±1.85, Social Subdimension 7.21±1.87 (Table 1).

Table 1. Descriptive characteristics of individuals (n=384).

Demographic characteristics		**n**	**%**
Gender	Female	274	71.4
	Male	110	28.6
Marital status	Married	34	8.9
	Single	350	91.1
Family type	Elementary family	288	75.0
	Extended family	86	22.4
	Divided family	10	2.6
Education level	Primary education	6	1.6
	Secondary education	163	42.4
	Tertiary education	202	52.6
	Postgraduate	13	3.4
Monthly income status	My income is less than my expenses	179	46.6
	My income is equal to my expenses	173	45.1
	My income is more than my expenditure	32	8.3
Chronic disease condition	Yes	25	6.5
	No	359	93.5
Chronic disease in the family	Yes	200	52.1
	No	184	47.9
			$\overline{X}$ **±SS (Min-Max)**
Age (Year)			22.68±4.48 (18-55)
Mean Total Score of Health Literacy Scale			102.27±17.34
Access to Information Subdimension			20.55±4.05
Information Understanding Subdimension			29.06±5.28
Appraisal / Evaluation Sub-dimension			32.50±5.94
Application/ Utilization Subdimension			20.16±3.82
Mean Total Score of Digital Literacy Scale			64.39±12.75
Attitude Sub-dimension			27.15±5.54
Technical Sub-dimension			22.41±4.99
Cognitive Sub-dimension			7.60±1.85
Social Sub-dimension			7.21±1.87

n: Count, **%:** Column percentage.

The regression model developed to determine the effect of digital literacy on health literacy level was found F (1,382) =194.700, p=0.001 and 33.8% of the variance in the dependent variable (R^2=.338) was explained by the independent variable. The independent variable predicts the dependent variable. Accordingly, digital literacy level has a positive and significant effect on health literacy level (β=0.581; t=13.953, p=0.001) (Table 2).

Table 2. Simple linear regression analysis to determine the effect of digital literacy on health literacy level (n=384).

Independent variable	**B**	**SD**	**β**	**t**	**p***
(Constant)	51.418	3.71		13.838	**0.001**
Digital Literacy Scale	0.790	0.057	0.581	13.953	**0.001**
	R=0.581 R^2=0.338 F=194.700 p=0.001				

Simple linear regression analysis*

DISCUSSION

Communication, which is the basis of the inclusion of individuals in society, has undergone a process from face-to-face communication to virtual communication over time. With this change in the communication of individuals, there has been a great increase in the use of mass media and with this increase, the habits of obtaining information easily have been gained. Although the importance of easy access to information in human life is indisputable, it is also a fact that not all information is correct or not all correct information is interpreted correctly. With the coronavirus pandemic, the role of mass media in people's lives was once again understood, and extremely vital information was provided on issues related to the virus and disease while people could not leave their homes. In addition to such an important and positive role of mass media, it is not only the competent authorities who provide health information. Social media applications are channels where information can be easily registered and shared without measuring its accuracy. Therefore, in environments such as social media, where the accuracy of the information shared cannot be checked, individuals need to confirm and understand the accuracy of the information and reflect it in their lives. However, even if the information is correct, it is still related to the individual's skills to make sense of it correctly and apply it correctly (Akalın et al., 2021). Two of the skills related to providing the right information and using this information are digital literacy and health literacy, and the relationship between these two skills was examined in the study:

The mean total score of the health literacy scale was 102.27±17.34. Considering that the score that can be obtained from the scale can be between 25-125, it can be said that the score obtained is quite good. In a study conducted by the Ministry of Health (2018) with 6628 participants, it was determined that 6.9 out of 10 people in each age group in Turkey have inadequate or problematic-limited health literacy level. According to the results of the health literacy survey conducted in 9 countries in Europe, 4.8 out of 10 people have inadequate or problematic-limited health literacy level (Sørensen et al., 2015). When the results of the study adapted to Turkish by Aras and Bayık Temel (2017) and applied to 30 patients twice with a four-week interval are examined; it is seen that the mean health literacy score is 90.30±12.35. In the other study conducted by İbrahimoğlu et al. (2019) with 437 participants, the average health literacy score was determined as 13.32±3.62 in the range of 0-23 points. When the studies in the literature are examined, it can be said that the health literacy level of the participants is very good (102.27±17.34).

The participants' digital literacy levels were found to be above moderate. In the study conducted by Çetin (2016), it was determined that the participants' digital literacy levels were at an adequate level. In the study conducted by Semerci (2019) and Güngör & Kurtipek (2020), it was concluded that the participants' digital literacy levels were above the moderate level. In some studies, it was concluded that the participants' digital literacy levels were high (Karakuş & Ocak, 2019; Kozan & Özek, 2019). The findings align with the existing literature.

The regression model developed to determine the effect of digital literacy on health literacy level was found $F(1,382)=194.700$, $p=0.001$ and it was determined that the level of digital literacy had a positive and significant effect on the level of health literacy ($\beta= 0.581$; $t(382)=13.953$, $p=0.001$). In the study conducted by Van der Vaart and Drossaert (2017) on 200 people aged 18-84 in the Netherlands with the digital health literacy tool, a moderate relationship was found between digital health literacy and general health literacy and digital skills. The findings in the study show the impact of e-health utilization on people's lives. More than half of the participants reported using health-related social media or consumer review sites.

In the study conducted by Rosario et al. (2020) on 3084 university students in Portugal with the digital health literacy tool, the relationship between digital health literacy related to COVID-19 and online information-seeking behavior among university students was examined. According to the study findings, digital health literacy was found to be associated with university students' online information-seeking behavior during COVID-19. Male students were reported to have less difficulty than females when adding their digital content and evaluating the reliability of health information they obtained from online sources. Those who searched more frequently on websites of public institutions and health portals were found to be more likely to achieve an adequate level of digital health literacy in assessing the reliability of health information. The findings highlight the critical role of targeted interventions to enhance digital health literacy among university students, emphasizing the need for gender-sensitive approaches and promoting the use of reliable online health information sources.

CONCLUSION

This study found that as individuals' digital literacy levels increase, their health literacy levels also improve. To address this, it is recommended to provide training programs to enhance digital literacy and use public service announcements on social media to raise awareness. Academically, future studies should focus on identifying barriers to digital and health literacy and explore interdisciplinary approaches to develop effective strategies. Evaluating the impact of training and campaigns and fostering collaboration between policymakers, educators, and health professionals can further bridge the literacy gap and improve public health outcomes.

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Conflict of Interest
The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Author Contributions
Plan, design: M.S.Y.; **Material, methods and data collection:** M.S.Y.; **Data analysis and comments:** M.S.Y.; **Writing and corrections:** M.S.Y.

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Factors Affecting Urinary Incontinence in Women and Its Effect on Quality of Life

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ABSTRACT
Objective: The objective of this study is to determine the risk factors of urinary incontinence in women and its effects on quality of life. **Materials and Methods:** The descriptive and cross-sectional study was conducted with 156 female patients who applied to the Gynecology and Obstetrics outpatient clinic of a university hospital. The data were collected by the researcher using a face-to-face questionnaire method. **Results:** The prevalence of urinary incontinence was found to be 51.3%, the most common being 53.8% was stress incontinence. It was observed that the severity of incontinence increased, and quality of life scores decreased in parallel with age and number of births. There was a statistically significant correlation between vaginal delivery and having gynecologic surgery and incontinence ($p<0.05$). **Conclusion:** Urinary incontinence, which is common in women, negatively affects the quality of life. Advanced age, vaginal delivery, high number of deliveries, and history of gynecologic surgery increase the risk of urinary incontinence.
Keywords: Urinary Incontinence, Risk Factors, Quality of Life, Urogynecology, Women's Health.

Kadınlarda İdrar Kaçırmayı Etkileyen Faktörler ve Yaşam Kalitesine Etkisi

ÖZ
Amaç: Kadınlarda idrar kaçırmanın risk faktörlerini ve yaşam kalitesine etkilerini belirlemektir**. Gereç ve Yöntem:** Tanımlayıcı ve kesitsel tipteki çalışma bir üniversite hastanesinin Kadın Hastalıkları ve Doğum polikliniğine başvuran 156 kadın hasta ile gerçekleştirildi. Veriler araştırmacı tarafından yüz yüze anket yöntemi kullanılarak toplandı. **Bulgular:** Üriner inkontinans görülme sıklığı %51,3 olarak saptandı, en sık görüleni ise %53,8 ile stres inkontinanstı. Yaş ve doğum sayısına paralel olarak idrar kaçırma şiddetinin arttığı ve yaşam kalitesi puanlarının azaldığı görüldü. Vajinal doğum yapmak ile jinekolojik cerrahi operasyon geçirmek ve inkontinans arasında istatistiksel olarak anlamlı bir ilişki vardı ($p<0,05$). **Sonuç:** Kadınlarda sık görülen idrar kaçırma yaşam kalitesini olumsuz etkilemektedir. İleri yaş, vajinal doğum, doğum sayısının fazla olması ve jinekolojik cerrahi öyküsü idrar kaçırma riskini arttırmaktadır.
Anahtar Kelimeler: İdrar Kaçırma, Risk Faktörleri, Yaşam Kalitesi, Ürojinekoloji, Kadın Sağlığı.

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INTRODUCTION

Incontinence is the inability to hold or control urine or feces. Urinary incontinence (UI) is the involuntary leakage of urine. This may be due to muscle weakness or loss of bladder control. UI is quite common in women (Vaughan & Markland, 2020).

It is estimated that about one in four women worldwide have experienced urinary incontinence at some point in their lives. This rate may be higher in older women. UI is particularly common among postmenopausal women (Vaughan & Markland, 2020). With age, factors such as hormonal changes in the body, muscle weakening, and prolapse of the pelvic organs increase the risk of urinary incontinence. During childbirth, women having a normal delivery are also more likely to experience urinary incontinence (Akkus & Pinar, 2016; Patel et al., 2022). Bladder infections, urinary tract infections, and some neurological diseases may also increase the risk of UI (Patel et al., 2022).

The severity of UI depends on how often and how severely a person experiences symptoms. UI can range from mild to severe and can significantly affect the quality of life (John Goforth, 2017). Mild UI can take the form of mild urinary incontinence during coughing, sneezing, or exercise. Moderate incontinence may cause a person to leak urine slightly more frequently and may limit daily activities. Severe UI is characterized by frequent and intense urinary incontinence and can significantly affect the quality of life (Haylen et al., 2010; Wood & Anger, 2014). Determining the severity of UI plays an important role in the selection of appropriate treatment modalities. In the case of mild incontinence, methods such as exercises to strengthen the pelvic floor muscles or bladder training may be useful, whereas severe incontinence may require surgical interventions or other advanced treatment options (Bostancı et al. 2015). A systematic review of the strength of the association between UI and quality of life concluded that UI is strongly associated with poor quality of life. (Pizzol et al., 2021). The literature shows that women with urinary incontinence have a significantly lower quality of life than women without urinary incontinence. Significant deteriorations in areas such as physical, emotional and social functioning, psychological well-being and general quality of life have been reported. The results of the studies show that urinary incontinence seriously affects the quality of life of women and this effect is more pronounced in untreated urinary incontinence (Åhlund et al., 2020; Magnani et al., 2019; Nygaard et al., 2018).

In line with these findings, it was aimed to contribute to the literature by determining the risk factors of UI in women and their effects on quality of life.

Research questions

- Is there a relationship between some characteristics of women and urinary incontinence?
- Is there a relationship between the severity of urinary incontinence and quality of life?

MATERIALS AND METHODS

Type of research

It is a descriptive cross-sectional study.

The research was conducted at the Gynecology and Obstetrics Polyclinic of a university hospital between September 2022 and February 2023, after receiving ethics committee approval and institutional permission.

Population and sample

The polyclinic where the study was conducted operates on weekdays and during working hours. The population of the study consisted of patients over the age of 18 who applied to the Gynecology and Obstetrics Polyclinic, and the sample consisted of 156 patients who met the study criteria.

Research inclusion criteria

- Being over 18 years of age
- No Turkish speaking or hearing impairment
- Volunteering to participate in the study

Research exclusion criteria

- Mentally retarded
- Turkish speaking and hearing impaired

Data collection tools

***Personal Information Form*:** By reviewing the relevant literature on the subject (Batmani et al., 2022; İlçioğlu et al., 2018; Karaca & Demir, 2019; Ninomiya et al., 2018; Suhr & Lahmann, 2018; Vaughan & Markland, 2020) the personal information form prepared by the researcher consisted of a total of 13 questions inquiring about socio-demographic characteristics (age, gender, BMI, marital status, educational status, number, and type of births, smoking status, etc.) and disease-related characteristics (history of surgery, presence and type of UI, treatment status, etc.).

Incontinence Severity Index (ISI): Developed by Sandvik et al. and applied to women with urinary incontinence, the "ISI" is a universally accepted, easily applied, short, and simple index. (Sandvik et al., 1993). Turkish validity and reliability were conducted by Hazar Uyar and Şirin in 2008. (Hazar & Şirin, 2008). This index is a multiplicative score (A×B) based on 2 items. A: How often do you have urinary incontinence (less than once a month=1; several times a month=2; several times a week=3; every day and/or every night=4 points)? B: How much urine do you leak each time (drops=1; small spots=2; more=3 points)? The total score ranges from 1 to 12, with a higher score indicating a more severe UI. According to the Hazar and Şirin Cronbach alpha reliability analysis, the reliability coefficient was found to be=0.67, and in our study, α=0.73.

***The Incontinence Quality of Life Scale* (I-QOL):** Incontinence quality of life scale consists of 28 questions. The first form was developed by Wagner et al. in 1996 in the USA to determine the quality of life in patients with UI. (Wagner et al., 1996).

However, the scale was revised by Patrick, Martin, Bushnell, Yalcın, Wagner, and Buesching in 1999 and the number of questions was reduced to 22 by removing six questions with the evaluation of psychometric measurements during the creation of the European versions. (Patrick et al., 1999). Validity and reliability studies of the scale were conducted by Özerdoğan and Kızılkaya. (Özerdoğan & Kızılkaya, 2003). The Incontinence Quality of Life Scale consists of three sub-domain scales, which are limitations of behaviors, psychosocial impact, and social isolation. In the 22-item Incontinence Quality of Life Scale (I-QOL), all items are evaluated on a five-category Likert-type scale (1= very much, 2= quite a bit, 3= moderately, 4= a little, 5= not at all). When calculating the scores for the sub-dimensions and the overall scale, the sum of the items in each dimension is taken. The maximum score for the total score is 110, the maximum score for the subscale measuring restriction of behaviors is 40, the maximum score for the psychosocial impact subscale is 45, and the maximum score for the social isolation subscale is 25. A low score indicates poorer quality of life, and a high score indicates better quality of life. According to the Cronbach alpha reliability analysis of the scale, the reliability coefficient was found to be = 0.97. In our study, α=0.93.

Statistical analysis

The data obtained were evaluated in SPSS 22 package program. Kolmogorov Smirnov test was performed to check the conformity of continuous variables to normal distribution. It was observed that the data of the study were suitable for normal distribution. Mean, standard deviation, percentage, the "Independent Sample-t" test (t-table value) was used to compare the measurement values of two independent groups, and the "ANOVA" test (F-table value) method was used to compare the measurement values of three or more independent groups. Bonferroni Correction was used to find from which group the significant difference originated. The results were evaluated at a 95% confidence interval and significance was evaluated at $p<0.05$ level.

Ethical considerations

This study was conducted in accordance with the principles of the Declaration of Helsinki. Approval as received from a University Non-Interventional Clinical Practices Ethics Committee (Date 13.05.2022, Approval no:31). The patients, who constituted the sample group of the study, were informed about the purpose, scope, duration and expectations of the study, and their written consent was obtained to participate in the study in the light of the principle of volunteering and voluntarism.

RESULTS

The mean age of the participants was 35±16 years (min=18, max=84), 67.9% were married and 24.3% were literate. The number of children was 33.1% with 2 children and 63.1% had a normal delivery. At the time of hospital admission, 17.9% had a prediagnosis of metrorrhagia and 51.3% were smokers. 43% of the participants had a history of surgery and the most common type of surgery was gynecologic surgery with 46.3% (Table 1).

In Table 2, the characteristics of the participants regarding incontinence and their treatment status were analyzed. Incontinence problems were experienced by 51.3% of the participants and the most common type of incontinence was stress incontinence with a rate of 53.8%. Thirty-five percent of the participants received treatment for incontinence and the most common treatment was medication with a rate of 32.1% (Table 2).

In Table 3, the demographic characteristics of the participants with incontinence were compared with incontinence severity and incontinence quality of life scores. Incontinence severity increased and quality of life scores decreased with increasing age and number of births (p=0.00, p=0.01, respectively). Being married, having a history of gynecologic surgery, having a normal delivery, and having a low level of education were factors that increased the severity of incontinence (p=0.02, p=0.02, p=0.04, p=0.05, respectively) (Table 3).

Table 3 compares the mean incontinence severity and quality of life scores of the participants with the type of incontinence and the treatment they received. A statistically significant relationship was found between incontinence type and mean incontinence severity and quality of life scores (t=4.47, p=0.01, t=-4.60, p=0.01, respectively). The highest mean incontinence severity score was found in mixed-type incontinence (8.2±8.6) and these participants had the lowest quality of life scores (51.6±17.6). A statistically significant relationship was found between the treatment received and the mean incontinence severity score and the mean quality of life score. While the incontinence severity score decreased in participants who received biofeedback treatment, quality of life was found to be lower in participants who did not receive treatment (t=3, p=0.03, t=-5.29 p=0.02, respectively) (Table 3).

When the incontinence quality of life and incontinence severity of participants with incontinence were evaluated, the most disturbing item in the limitation of behaviors sub-dimension was found to be "I am worried about not reaching the toilet on time" with 48.1%. In the sub-dimension of psychological impact, 33.8% of the participants said: "My incontinence problem makes me feel helpless". In the sub-dimension of straining social life, 32.5% said: "I am worried that my urinary problem will get worse as I get older". The mean incontinence quality of life score was 61±19.8 (min=22, max=109) and the mean incontinence severity score was 5.1±3.4 (min=1, max=12) (Table 4).

Table 1. Examination of the demographic data of the participants (n=156).

Variables	n	%*
Educational status		
Illiterate	16	15.5
Literate	24	23.3
Primary education	18	17.5
High school	20	19.4
Undergraduate education	25	24.3
Job		
Officer	23	14.7
Health Worker (Doctor, Nurse, Psychologist)	18	11.5
Self-Employment	32	20.5
Housewife	75	48.2
Student	8	5.1
Marital status		
Single	50	32.1
Married	106	67.9
Mode of birth		
Caesarean section	24	23.3
Normal birth	65	63.1
Caesarean+normal delivery	14	13.6
Number of children		
1 child	25	24.3
2 children	34	33.1
3 children	21	20.4
4 children and above	23	22.2
Preliminary diagnosis		
Metrorrhagia	28	17.9
Cervix ca	11	7.1
Menopause	16	10.3
Vaginal bleeding	14	9
Control purpose	14	9
Vaginal infection	17	10.9
Thickening of the endometrium	3	1.8
Other (fibroids, polyps, ever cyst, cystocele)	53	34
Cigarette use		
Yes	72	51.3
No	84	48.7
Surgery history		
Yes	67	43
No	89	57
Type of surgery		
GIS	22	32.8
Gynecological	31	46.3
Endocrine	6	9
Other	8	11.9
Variables	**Mean± SD**	**Min-Max**
Age	35±16	18-84

*****Column percentage.

Table 2. Evaluation of the participants in terms of incontinence (n=80).

Variables	n	%*
Presence of incontinence		
Yes	80	51.3
No	76	48.7
Incontinence type		
Urgency	14	17.5
Stress	43	53.8
Mixed	23	28.7
Incontinence treatment status		
Yes	28	35
No	52	65
Type of treatment received		
Medication Therapy	9	32.1
Kegel Exercise	8	28.6
Biofeedback	6	21.4
Acupuncture	5	17.9

*Column percentage.

Table 3. Comparison of demographic characteristics, incontinence severity and incontinence quality of life scores of participants with incontinence (n=80).

Variables	n	Incontinence Severity Total Score mean± SD	Significant Difference	Incontinence Quality of Life Total Score mean± SD	Significant Difference
Age					
Under 50 years old (1)	56	4.32±2.89	2>1	62.98±11.18	
Over 50 years old (2)	24	8.29±8.3		58.25±25.09	
		t=-3.17. **p=0.00***		t=-0.97. p=0.33*	
Marital Status					
Married (1)	51	6.37±6.2	1>2	59.54±19.5	
Single (2)	29	4±3		65.10±20.2	
		t=-1.20. **p=0.02***		t=-1.44. p=0.16*	
Cigarette Use					
Yes (1)	25	5.16±3.5		62.23±21.6	
No (2)	55	6.28±8.2		60±15.4	
		t=-0.85. **p=0.39***		t=-0.44. p=0.65*	
Number of Births					
Not given birth (1)	30	3.7±2.7		65.7±15.9	
1 birth (2)	14	5.5±3.5	4>5>3>2>1	56.6±23.9	4>5>2>1>3
2 births (3)	15	5.1±3.3		72.6±22.2	
3 births (4)	6	11.5±15.5		50.7±16.2	
4 or more births (5)	15	7±4		51.3±14.9	
		F=3.32 **p=0.01****		F=3.58. **p=0.01****	
Mode of Birth					
Not given birth (1)	30	3.7±2.7		65.7±15.9	
Caesarean Section (2)	16	4.8±2.9	3>4>2>1	60±20.5	
Normal Birth (3)	31	7.5±7.5		43±18.5	
Normal+Caesarean (4)	3	7±5.6		61.6±19.8	
		F=2.81. **p=0.04****		F=1.41. p=0.24**	
Education Status					
Illiterate (1)	8	7.87±3.2		56.3±12.9	
Literate (2)	12	5.5±3.6		56.9±22.9	
Primary Education (3)	12	9±11.4	3>1>2>4>5	58.3±19.7	
Secondary Education (4)	25	4.4±2.5		63.56±20.8	
Undergraduate (5)	23	4±3.4		65.4±19.6	
		F=2.46. **p=0.05****		F=0.65 p=0.62**	
History of surgery					
Yes (1)	41	6.9±6.9	1>2	61.7±22.8	
No (2)	39	4.1±2.7		61.4±16.4	
		F=5.46. **p=0.02****		F=0.00. p=0.94**	
Incontinence Type					
Urgency (1)	14	3.9±3.3	3>2>1	67.9±21.7	3>2>1
Stress (2)	43	4.6±2.8		64.9±18.7	
Mixed (3)	23	8.2±8.6		51.6±17.6	
		t=4.47. **p=0.01****		t=-4.60. **p=0.01****	
Treatment Received			2>3>1>5>4		
No treatment (1)	50	5±3.3		57.3±10.1	3>4>5>2>1
Medication (2)	9	10±12.7		61.7±32.8	
Kegel Exercise (3)	12	5.5±4.5		75.3±30.7	
Biofeedback (4)	3	2.3±0.6		71.7±21.5	
Acupuncture (5)	6	4.7±2.2		64.5±23	
		t=3. **p=0.03****		t=-5.29 **p=0.02****	

*Student's t-test, ** One Way ANOVA

Table 4. Evaluation of incontinence quality of life and incontinence severity in participants with incontinence (n=80).

Variables	Too much n(%)	Quite A Lot n (%)	Moderate n(%)	A bit n(%)	Nothing n(%)
Limiting Behaviors Sub-dimension					
I worry about not making it to the toilet on time	38 (47.5)	18 (22.5)	15 (18.75)	5 (6.25)	4 (5)
I worry when I cough and sneeze	29 (36.25)	23 (28.75)	14 (17.5)	6 (7.5)	8 (10)
When standing up after sitting down, I must be careful	18 (22.5)	28 (35)	13 (16.25)	7 (8.75)	14 (17.5)
For the first time, I am worried about where the toilets are in the places I visit	17 (21.25)	21 (26.25)	17 (21.25)	11 (13.75)	14 (17.5)

Table 4. Evaluation of incontinence quality of life and incontinence severity in participants with incontinence (n=80).

Variables	Too much n(%)	Quite A Lot n (%)	Moderate n(%)	A bit n(%)	Nothing n(%)
Frequent trips to the toilet are necessary for me	15 (18.75)	22 (27.5)	17 (21.25)	15 (18.75)	11 (13.75)
Because of my incontinence, I must plan every detail in advance	24 (30)	15 (18.75)	14 (17.5)	11 (13.75)	16 (20)
I have difficulty sleeping well at night	14 (17.5)	18 (22.5)	19 (23.75)	11 (13.75)	18 (22.5)
I must watch what I drink	16 (20)	21 (26.25)	12 (15)	14 (17.5)	17 (21.25)
Psychological Impact I feel depressed (depressed)	14 (17.5)	17 (21.25)	14 (17.5)	21 (26.25)	14 (17.5)
I do not feel free to leave my home for long periods of time	16 (20)	15 (18.75)	17 (21.25)	17 (21.25)	15 (18.75)
I feel frustrated because my incontinence problem prevents me from doing what I want to do	12 (15)	21 (26.25)	15 (18.75)	15 (18.75)	17 (21.25)
I am constantly preoccupied with my incontinence	21 (26.25)	20 (25)	16 (20)	6 (7.5)	17 (21.25)
My incontinence gives me the feeling that I am not a healthy person	19 (23.75)	17 (21.25)	16 (20)	9 (11.25)	19 (23.75)
I enjoy life less because of my incontinence	13 (16.25)	20 (25)	23 (28.75)	10 (12.5)	14 (17.5)
My incontinence problem makes me feel helpless	27 (33.75)	17 (21.25)	14 (17.5)	8 (10)	14 (17.5)
My incontinence problem limits my choice of clothes	16 (20)	17 (21.25)	15 (18.75)	13 (16.25)	19 (23.75)
I am worried about having sexual intercourse	15 (18.75)	14 (17.5)	20 (25)	9 (11.25)	22 (27.5)
Social life Strain I worry that others will smell urine on me	22 (27.5)	14 (17.5)	16 (20)	8 (10)	20 (25)
I am worried that my urinary problem will get worse as I get older	26 (32.5)	10 (12.5)	12 (15)	19 (23.75)	13 (16.25)
I worry about being embarrassed or humiliated because of my incontinence	18 (22.5)	19 (23.75)	19 (23.75)	8 (10)	16 (20)
I worry about wetting my pants	24 (30)	25 (31.25)	12 (15)	4 (5)	15(18.75)
I feel like I can't control my bladder	21 (26.25)	15 (18.75)	22 (27.5)	8 (10)	14 (17.5)
Variables			**Mean± SD**		**Min-Max**
Incontinence Quality of Life Score			61.6±19.8		22-110
Incontinence Severity Score			5.5±5.4		1-12

DISCUSSION

UI in women negatively affects the quality of life and has a high prevalence. In our study, the prevalence of UI in women was found to be 51.3%. When the literature is examined, it is seen that UI studies are generally conducted with the elderly female population. Murukesu et al. found the prevalence of UI in elderly women to be 19% (Murukesu et al., 2019), İlçioğlu et al. 71.5% (İlçioğlu et al., 2018), and Aly et al. reported it as 80%. In a systematic meta-analysis study evaluating the prevalence of UI in elderly women, the score of 37.1% was found (Batmani et al., 2022). The rate in older women in the literature varies between 19% and 80% as seen. In the study, the prevalence of urinary incontinence was 51.3%, which is consistent with the literature considering the average age. Low level of education (24.3% were literate), number of children (33.1% with 2 children), mode of delivery (63.1% vaginal delivery), smoking (51.3% were smokers), and history of surgery (43%) were thought to be effective in this high prevalence. The fact that 43% of those with a history of surgery had gynecologic surgery increased the risk. When the literature is examined, in parallel with the study, gynecologic surgery history is seen as a risk factor for UI because it causes damage to the pelvic floor muscles and nerves. (Batmani et al., 2022; Hage-Fransen et al., 2021; İlçioğlu et al., 2018).

In addition, as in the study, vaginal delivery causes damage to pelvic support tissues and prolapse and is often reported to trigger stress-type UI. (Aşık & Serpil, 2021; Batmani et al., 2022; Hage-Fransen et al., 2021; İlçioğlu et al., 2018).

In a study conducted on women in the USA, stress type incontinence was reported to be the most common type with 45.9%,(Abufaraj et al., 2021), but there are studies in the literature reporting that mix type UI is the most common type of UI, followed by stress type UI. (Doğan et al., 2022; Karaca & Demir, 2019; Nygaard et al., 2018). In this study, the most common type of incontinence was found to be the stress-type incontinence (53.8%) and it was thought that it may have been the most common type of UI due to the normal delivery rate (63%).

The perception of urine odor by others in individuals with UI decreases the quality of life by causing embarrassment, isolation, and depression for those with urinary incontinence. (Boylu & Dağlar, 2019).

Among the participants in the study, participants with mixed type UI had the highest incontinence severity score average (8.2±8.6) and the lowest incontinence quality of life score average (51.6±17.6). In a study conducted by Nygaard et al., it was found that mix-type UI negatively affected the quality of life in individuals with UI (Nygaard et al., 2018), while Lim et al. stated that stress-type UI negatively affected the quality of life and quality of life worsened as the severity of incontinence increased (Lim et al., 2017). However, in another study, it was found that quality of life was affected worse in people with Urgency UI (İrer et al., 2018). In addition, studies are reporting that quality of life is similar in all types of incontinence (Kaya et al., 2015).

Although UI is not a life-threatening disease, it is a common health problem that affects women physically and negatively affects their quality of life. It is also a health problem that causes deterioration in women's social and interpersonal relationships and interferes with their work and educational activities (Altınboğa et al., 2016; Rüzgar et al., 2020). In this study, 48.1% of the participants stated that they were psychologically negatively affected by urinary incontinence by saying "I worry about not being able to reach the toilet on time", 32.5% said: "I worry that my urinary problem will get worse as I get older" and 33.8% said: "My urinary incontinence problem makes me feel helpless". In parallel with the results of the study, studies in the literature have reported that urinary incontinence is a health problem that requires changes in women's daily activity routines and restrictions in various social activities, and careful planning, and these conditions have been associated with psychological well-being, depressive symptoms and impaired quality of life. (Åhlund et al., 2020; Brown et al., 2015; Magnani et al., 2019). Regardless of its type, UI negatively affects the life of the individual. Treatment of UI in women can vary depending on the severity and cause of symptoms. The frequency of UI in women can be reduced by lifestyle changes, exercise, and other treatment options (Suhr & Lahmann, 2018). It should be recognized that urinary incontinence symptoms are not among inevitable and acceptable consequences of pregnancy and childbirth. As UI can hurt women's psychological health, it is important that women should have health care in such a situation.

Limitations and Strengths

Since the center where the study was conducted is a university hospital serving a large region, it strengthens our study in terms of patient diversity. However, since the study was conducted in a single center and over a period of 6 months, the data obtained from the study cannot be generalized. This is the limitation of our study.

CONCLUSION

UI, which women may encounter at any time in their lives, negatively affects their quality of life. This effect is related to the type and severity of UI. Since there are different results in the studies about which type of incontinence affects the quality of life more, it is clear that more studies are needed on this subject. Organizing trainings on the subject within the scope of public health education will increase awareness of UI.

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Conflict of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Author Contributions

Plan, design: RA; **Material, methods and data collection:** RA, HS, DA; **Data analysis and comments:** RA, HS, DA; **Writing and corrections:** RA, HS, DA.

Ethical Approval

Institution: Çukurova University Faculty of Medicine Non-Interventional Clinical Research Ethics Committee
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The Relationship of Fractal Dimension and Osseointegration: A Retrospective Radiologic Clinical Trial

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ABSTRACT

Objective: The objective of this study was to evaluate the density of alveolar bone in the peri-implant area using fractal analysis on orthopantomograms, both prior to and following clinical osseointegration. **Material and Methods:** Orthopantomograms were performed prior to the implant surgery and again four months postoperatively. Regions of interest at the mesial, distal, and apical sites of the implants were identified for analysis. The method by White and Rudolph was employed to calculate the fractal dimension. Subsequently, fractal dimension values were compared across all recorded measurements. **Results:** Statistical analyses revealed significant correlations between the mesial measurements before and after surgery, as well as between the distal measurements pre- and post-operatively, compared to the apical measurements over the same periods. Further subgroup analyses identified significant correlations in pre- and post-operative fractal dimension values specifically within the female subgroup, with notable distinctions observed between pre-mesial, post-mesial, and the average values before and after surgery ($p<0.05$). Moreover, substantial differences were detected between the jaws ($p<0.05$) and the specific locations within the jaws ($p>0.05$), regarding the fractal dimensions measured pre- and post-operatively. **Conclusion:** Fractal analysis has demonstrated its reliability as a method for both clinical and radiological assessment of osseointegration.

Keywords: Dental implants, Fractal dimension, Orthopantomogram, Osseointegration.

Fraktal Boyut ve Ossentegrasyon İlişkisi: Retrospektif Radyolojik Klinik Deneme

ÖZ

Amaç: Bu çalışmanın amacı, klinik ossentegrasyon öncesi ve sonrasında ortopantomogramlar üzerinde fraktal analiz kullanarak alveolar kemik yoğunluğunu değerlendirmektir. **Gereç ve Yöntem:** İmplant cerrahisi öncesinde ve ameliyattan dört ay sonra ortopantomogramlar çekildi. İmplantların mezial, distal ve apikal bölgelerinde analiz için ilgi alanları belirlendi. Fraktal boyut hesaplamak için White ve Rudolph yöntemi kullanıldı. Daha sonra, kaydedilen tüm ölçümlerde fraktal boyut değerleri karşılaştırıldı. **Bulgular:** İstatistiksel analizler, cerrahi öncesi ve sonrası mezial ölçümler arasında, aynı dönemlerde apikal ölçümlere kıyasla distal ölçümler arasında önemli korelasyonlar ortaya koydu. Daha fazla alt grup analizleri, özellikle kadın alt grubu içinde cerrahi öncesi ve sonrası fraktal boyut değerlerinde önemli korelasyonlar saptadı; cerrahi öncesi-mezial, cerrahi sonrası-mezial ve cerrahi öncesi ve sonrası ortalama değerler arasında belirgin farklar gözlemlendi ($p<0.05$). Ayrıca, çeneler arasında ($p<0.05$) ve çeneler içindeki spesifik lokasyonlar arasında ($p>0.05$), cerrahi öncesi ve sonrası ölçülen fraktal boyutlar açısından önemli farklar tespit edildi. **Sonuç:** Fraktal analiz, klinik ve radyolojik ossentegrasyon değerlendirmesi için güvenilir bir yöntem olarak kendini kanıtlamıştır.

Anahtar Kelimeler: Diş implantları, Fraktal boyut, Ortopantomogram, Ossentegrasyon.

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INTRODUCTION

The success of dental implants is contingent upon a multitude of variables, including implant type, patient-specific factors, surgical technique, the quality of the alveolar bone, and the process of achieving proper osseointegration (Lee et al., 2010). Osseointegration is defined as the direct structural and functional connection between the alveolar bone and the implant surface, distinguished by the absence of fibrous connective tissue (Mu, Lee, Park, & Moon, 2013; Tözüm, Bal, Turkyilmaz, Gülay, & Tulunoglu, 2010). The condition of the alveolar bone surrounding the implant is influenced by various factors such as trabecular architecture, structural integrity, mineral density, and the presence of microdamage (Çakur et al., 2008). A range of diagnostic tools is available for the assessment of bone osseointegration and quality (Tözüm et al., 2010). While dual-energy X-ray absorptiometry (DXA) is recognized for its efficacy in measuring bone mineral density, its application is limited by its inability to generate cross-sectional images. Conversely, cone-beam computed tomography (CBCT) and orthopantomograms (OPG) are widely utilized imaging techniques in the field of implantology (Jeong, Kim, Oh, & Jeong, 2013). To assess the quality of bone, measurements such as the Mandibular Cortical Index (MCI), which evaluates the thickness and morphology of the mandibular cortex, and fractal dimension (FD) values are frequently employed (Milillo et al., 2016).

Initially, Mandelbrot introduced fractal analysis (FA) as a technique to describe natural structures that do not conform to traditional geometric shapes (Geraets & Van der Stelt, 2014). Mandelbrot quantified the complexity of objects, whose dimensions do not align with standard units, through the concept of FD. Mandelbrot highlighted that FD, indicative of an object's degree of complexity, remains constant despite changes in scale. Thus, FA emerged as a mathematical approach enabling the quantitative depiction of intricate structures and patterns that cannot be defined by whole dimensions (Mandelbrot & Wheeler, 1982). FA has found extensive application in the medical domain, facilitating the diagnosis of diseases and the assessment of their severity and progression. Previous studies have established the use of FA in assessing bone quality; however, there remains a gap in its application to the comparative analysis of peri-implant alveolar bone density across different stages of osseointegration. Specifically, the trabecular architecture of cancellous alveolar bone, characterized by interconnected structures, proves conducive for fractal pattern analysis (Fazzalari & Parkinson, 1996).

The application of FA to periapical and OPG radiographs allows for the detection of variations in trabecular bone density and bone tissue demineralization (Oliveira et al., 2013). Within the field of dentistry, FA has been employed to study early periodontal alterations in alveolar bone, osteoporosis-related pathologies, the bone surrounding implant sites, and the severity of temporomandibular joint dysfunction (Arsan, Kose, Cene, & Ozcan, 2017; Soğur & Baksı, 2014).

The aim of this study was to utilize OPG imaging to compare the alveolar bone density in the peri-implant area, employing FA, for dental implants both before and following osseointegration.

MATERIALS AND METHODS

Patient selection

This retrospective study received ethical approval from the Ethics Board and Commissions of Nuh Naci Yazgan University, Kayseri, Turkey (Approval Number: 2022/8839). The research utilized OPGs obtained from patients who presented with complaints of missing teeth at the Faculty of Dentistry, Nuh Naci Yazgan University.

Inclusion criteria

1-Implant surgeries followed a submerged protocol.
2-A minimum waiting period of 4 months after implant surgery.
3-The age of the participants in the study is between 20–60 years
4-ASA I –II patients
5-Patient records without prosthetic loading
6-A minimum waiting period of 6 weeks after tooth extraction before implantation.

Exclusion criteria

1-Records of patients with any grafting procedure on dental implants
2-Records of patients who have previously had dental implants in the same area and lost their implants for any reason
3-Implants lost when wearing a healing cap

Surgical protocol

A single surgeon applied all the dental implant surgery to 29 patients.

Radiographic evaluation

All data were amassed within a computerized framework. The OPGs corresponding to each dental implant underwent evaluation for the determination of the FD. The parameters for exposure were uniformly set at 66–75 kVp, 10–14 mA, and a duration of 16 seconds across all images, by the guidelines provided in the reference manual for the KaVO OP 3D Pro system (PaloDEx Group Oy, Tuusula, Finland). The Frankfort horizontal plane was maintained equidistant, while the sagittal plane was aligned perpendicularly to the ground level. Images, boasting a resolution of 5.5 LP/mm, encompassing a grayscale range of 0-128 levels, and a pixel dimension of 2976 × 1536 (horizontal × vertical), were exported as TIFF files for further analysis.

Clinical evaluation

Four months post-implantation, the reverse torque values for all implants were assessed. Implants exhibiting a torque value exceeding 25 Ncm and displaying radiological evidence of healthy bone healing were deemed to have achieved clinical osseointegration. All implants included in the study were observed to meet these criteria, with no instances of implant failure reported.

Fractal dimension measurement

In the study conducted by Zeytinoglu et al., three regions of interest (ROIs) were delineated on the OPGs for each implant at the mesial, distal, and apical positions, defined as rectangles measuring 10 × 30 pixels (Zeytinoğlu, İlhan, Dündar, & Boyacioğlu, 2015). The software's polygon tool was employed to select ROIs maximizing proximity to the implants while excluding the roots, periodontal ligament, and lamina dura of adjacent natural teeth. The selected ROIs were then cropped and replicated for analysis. To mitigate brightness variations attributable to soft tissue thickness, a Gaussian blur filter was applied. The blurred image was subtracted from the original to produce a new image file, where a standard mean pixel value of 128 was established. Utilizing a brightness threshold of 128, the software's thresholding tool converted the image to binary format, where pixel values at or below 128 were rendered black, representing trabeculae and bone marrow, while all other values turned white. To minimize noise, the image underwent further processing, including degradation, enlargement, and color inversion, resulting in white areas denoting bone marrow and darker regions signifying trabecular bone. The image was skeletonized until there was only one central line in the left pixels. The box-counting feature was used to calculate the values of FD. Squares with pixel sizes of 2, 3, 4, 6, 8, 12, 16, 32, and 64 were systematically placed on the image. For each pixel size, the total number of squares and the number of squares with trabeculae were counted. A logarithmic scale graph of the FD values was created (Figure 1)

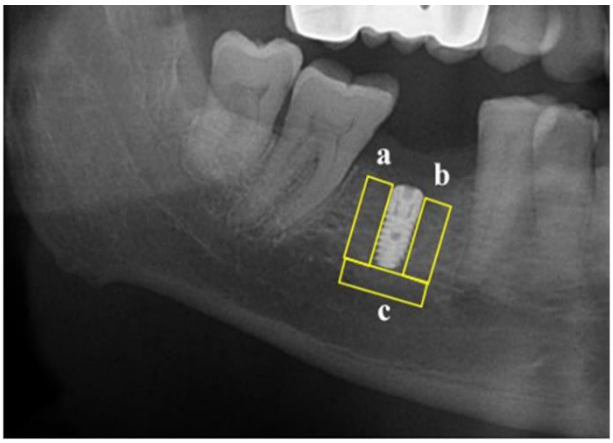

Figure 1. The logarithmic scale graph of the fractal dimension values.

In this study, OPGs captured before and after implantation were systematically compared. Despite the lack of standardized guidelines in the literature for the placement of ROIs on panoramic radiographs, our study adopted specific measures to ensure consistency. For pre-implant OPGs, ROIs were strategically located at equivalent positions by designating the initiation point of the pilot drill for the implant to be 4 mm distant from the root of the adjacent tooth. Additionally, the placement of implants was carefully adjusted to maintain a 2 mm gap from the roots of neighboring teeth. For edentulous patients, reference points for implant placement were determined based on identifiable anatomical landmarks. The uniformity of ROI locations was verified through measurements of implant distances to adjacent structures and anatomical landmarks on the panoramic images, utilizing the ImageJ software (available at https://imagej.nih.gov/ij/download.html, National Institutes of Health, Bethesda, MD, USA). All FAs were conducted by the same researcher using the same computer, employing the methodology outlined by White and Rudolph for the evaluation of FDs (Figure 2) (Cesur et al. 2020).

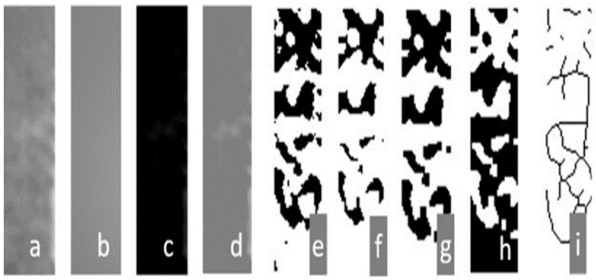

Figure 2. Selection of ROIs.

Statistical analysis

In a preliminary pilot study involving 12 patients with a total of 55 implants, the average FD was calculated to be 1.19±0.07. This pilot study's findings were consistent with Spearman's scale, indicating an estimated standard deviation of 0.07. Utilizing these parameters, the effect size was set at 0.27, with an alpha level (α) of 0.05 and a power of 0.85, for the sample size calculation conducted with the GPower 3.1.9 software (Heinrich-Heine-Universität Düsseldorf, Düsseldorf, Germany), resulting in a required sample size of 93 for the present study. Data analysis was performed using the Turcosa software (Turcosa Analytics Ltd. Co., Turkey). The distribution normality of the data was assessed with Shapiro-Wilk's test and Q-Q plots, revealing a non-normal distribution. Spearman correlation analysis was employed to investigate the relationships between the mesial, distal, apical, and average dimensions of the implants (mesial pre- and post-, distal pre- and post-, apical pre- and post-, and overall pre- and post-implantation). The study included 14 male and 15 female patients, with 48 implants in male patients and 45 in female patients analyzed. Implant outcomes were compared between genders. Spearman's correlation coefficient was utilized for all subgroup analyses, including pre- and post-implantation comparisons. The Mann-Whitney U test facilitated comparisons between genders and jaws, while the Kruskal–Wallis test was applied for analyses across different regions. A p-value of <0.05 was considered statistically significant. Post-hoc evaluations were conducted using the GPower 3.1.9 software (Heinrich-Heine-Universität Düsseldorf, Düsseldorf, Germany).

RESULTS

In this study, 93 implants were evaluated in 29 patients (14 males and 15 females), with an age range of 29 – 68 years (mean age, 49.4±10.7). The descriptive statistics for the study are presented in Table 1.

The overall analysis of the results is as follows:

1. A positive, weak, and statistically significant correlation was determined between the mesial-before and mesial-after variables (r=0.3166, p=0.002).
2. A significant correlation was determined between the distal-before and distal-after variables. (r=0.1567, p=0.004).
3. A positive, weak, and statistically significant correlation was determined between the apex variables before and after the apex variables (r=0.2921, p=0.004). (Figure 3).

The results of the analyses related to gender, edentulous area, edentulous jaw, and systemic conditions are as follows.

Gender in analyses

In gender-specific analyses, a statistically significant correlation was observed in the changes pre- and post-implantation exclusively among female patients, with the following notable results: A positive, moderate, and statistically significant association was identified between the mesial-pre and mesial-post variables in women (r=0.5323, p=0.041). Furthermore, a positive, strong, and statistically significant correlation was found between the distal-pre and distal-post variables in females (r=0.6586, p=0.008). Additionally, a strong and statistically significant positive correlation was noted between the average pre- and post-variables in females (r=0.6279, p=0.012). Upon analyzing the data from male patients exclusively, no significant differences emerged. However, when comparing between genders, each variable was examined individually. A statistically significant difference was noted in the distribution of mesial-post values, with males exhibiting higher values (1.405) compared to females (1.23) (p<0.001). Similarly, a significant disparity was observed in the distribution of average post-implantation values, with male patients showing higher averages (1.3483) than their female counterparts (1.2733) (p=0.002).

Analysis of edentulous areas

There was no statistically significant difference in the inter-regional comparison of all variables (p>0.05)

Anterior region

The analysis revealed a positive, moderate, and statistically significant association between the mesial-pre and mesial-post variables (r=0.4005, p=0.035). Furthermore, the correlation between the distal-pre and distal-post variables was positive, although weak, yet statistically significant (r=0.3777, p=0.048). Additionally, the relationship between the average values before and after was strong, positive, and statistically significant (r=0.617, p=0.001).

In the premolar region

The apex variables before and after the apex in the premolar area had a positive, moderate, and statistically significant correlation (r=0.5818, p=0.001).

In the molar region

The mesial-before and -post variables had a positive, moderate, and statistically significant correlation (r= 0.3969, p=0.018).

Analysis of jaw-based variables

The distal-before and distal-post variables showed a positive, although weak, and statistically significant connection in the maxilla (r=0.2671, p=0.047). The relationship between the apex variables before and after the apex was positive, weak, and statistically significant (r p=0.3447, p=0.009). The correlation between the mean values before and after the variables was favorable, moderate, and statistically significant (r=0.406, p=0.001). The analysis revealed significant differences in the distribution of all variables between the jaw categories, as detailed below:

A statistically significant difference was noted in the distribution of apex-before values, with the mandible category exhibiting a tendency towards higher values (1.34) compared to the maxilla category (1.275) (p=0.023). The distribution of mean-before values also showed a significant disparity, with values in the mandible category (1.32) tending to exceed those in the maxilla category (1.275) (p=0.008).

A statistically significant difference was observed in the mesial-post distribution, with the mandible category presenting higher values (1.4) compared to the maxilla category (1.255) (p=0.002). The distal-post distribution differed significantly between jaw categories, with the mandible category showing higher values (1.38) than the maxilla category (1.31) (p=0.047). A significant variation was identified in the apex-post distribution, where the mandible category's values (1.37) were higher than those in the maxilla category (1.245) (p=0.003).

Lastly, a statistically significant difference was found in the mean-post distribution, with the mandible category achieving higher values (1.35) compared to the maxilla category (1.27) (p<0.001).

Post-hoc test results

While the post-hoc power of this study was 0.85 in the correlation analyses involving 93 implants, the power of the correlation analysis results was found to be lower in the gender comparison, inter-regional comparison, and inter-jaw comparison, in which subgroups were examined. Specifically, the power of the results presented for 48 implants in males was 0.60, whereas the power of the results presented for 45 implants in females was 0.58. Additionally, the power of the study was found to be 0.36 according to the Mann-Whitney U test for the comparison between genders. When examining different regions, the power of the anterior region was 0.42, the premolar region was 0.44, and the molar region was 0.49. Furthermore, in this study, the power of the Kruskal–Wallis test results was found to be 0.63 in the inter-regional comparison of variables. Regarding the comparison between jaws, the power of the results presented for the 56 implants was 0.66, while for the 37 implants, it was 0.51. Finally, the power of the study was found to be 0.35 according to the Mann-Whitney U test for the comparison between jaw.

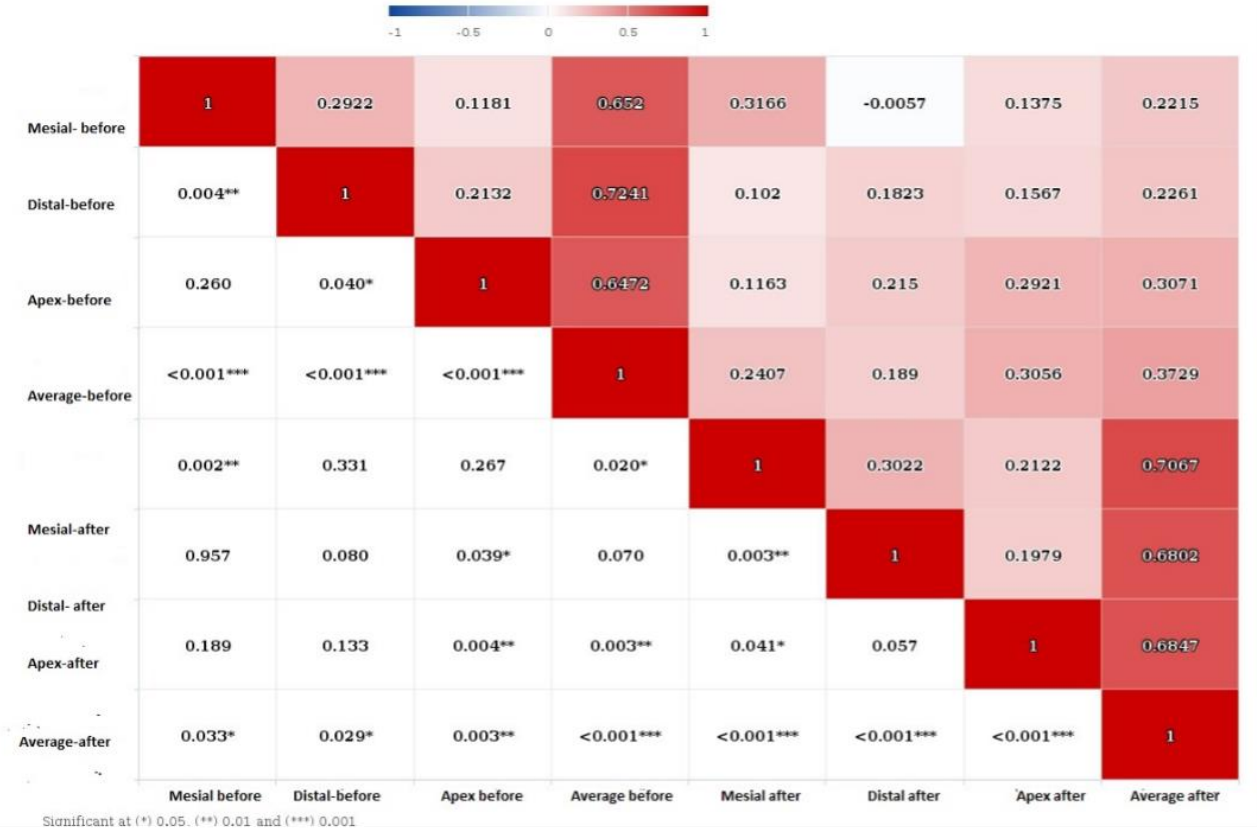

Figure 3. Statistical distribution of relations between variables.

Table 1. Descriptive statistic.

Variable	N	Mesial- before Mean ±SD (Median)	Distal-before Mean ±SD (Median)	Apex- before Mean ±SD (Median)	Average- before Mean ±SD (Median)	Mesial-after Mean ±SD (Median)	Distal-after Mean ±SD (Median)	Apex- after Mean ±SD (Median)	Average-after Mean ±SD (Median)
Gender									
Male	48	1.3±0.1 (1.3)	1.3±0.1 (1.31)	1.3±0.1 (1.3)	1.3±0.09 (1.3)	1.37±0.1 (1.4)	1.33±0.1 (1.36)	1.32±0.1 (1.33)	1.30±0.08 (1.34)
Female	45	1.26±0.1 (1.27)	1.31±0.1 (1.33)	1.29±0.1 (1.31)	1.29± 0.08 (1.29)	1.25±0.1 (1.23)	1.33±0.1 (1.34)	1.27±0.1 (1.27)	1.28±0.08 (1.27)
Region									
Anterior	28	1.3±0.1 (1.29)	1.3±0.13 (1.31)	1.29±0.11 (1.3)	1.3±0.08 (1.31)	1.34±0.1 (1.39)	1.3±0.13 (1.32)	1.27±0.2 (1.23)	1.3±0.1 (1.3)
Premolar	30	1.26±0.1 (1.26)	1.29±0.1 (1.3)	1.28± 0.1 (1.28)	1.27±0.08 (1.27)	1.26±0.13 (1.24)	1.33±0.1 (1.38)	1.3±0.1 (1.3)	1.3±0.07 (1.3)
Molar	35	1.3±0.1) 1.31	1.3± 0.1 (1.33)	1.3±0.2 (1.34)	1.31±0.01 (1.3)	1.33±0.1 (1.34)	1.33±0.1 (1.35)	1.3± 0.1 (1.34)	1.33±0.09 (1.33)
Jaw									
Maxilla	56	1.27±0.1 (1.27)	1.29±0.13 (1.28)	1.27±0.1 (1.28)	1.28±0.08 (1.28)	1.27±0.1) (1.26)	1.3±0.1 (1.31)	1.26±0.1 (1.25)	1.28±0.08 (1.27)
Mandible	37	1.3±0.1 (1.3)	1.33±0.1 (1.33)	1.34±0.1 (1.34)	1.33±0.08 (1.32)	1.37±0.1 (1.4)	1.36±0.1 (1.38)	1.35±0.1 (1.37)	1.36±0.08 (1.35)
Total	93	1.28±0.1 (1.3)	1.3±0.1 (1.32)	1.3±0.1 (1.3)	1.3±0.09 (1.3)	1.3±0.1 (1.32)	1.33±0.1 (1.35)	1.3±0.1 (1.3)	1.3±0.09 (1.3)

DISCUSSION

In the comprehensive analysis of the study group, without segmentation into subgroups, a correlation was discerned between pre- and post-implantation values, indicating changes over time. In the gender-specific subgroup analysis, a similar correlation was specifically identified among female participants. Further, significant differences were observed in the mesial pre- and post-implantation values, as well as the mean pre- and post-implantation values, between male and female participants. When examining the data according to different jaws, correlations between pre- and post-implantation values were noted within each jaw category, accompanied by statistically significant distinctions between these groups. Moreover, in the analysis focused on the location within the jaws, correlations were found between pre- and post-implantation values in specific edentulous regions, although the differences between these regional groups did not reach statistical significance. Osseointegration, a complex biological process, is defined by the establishment of a direct interface between an implant and bone, devoid of any intervening soft tissue (R. Gupta, N. Gupta, Kurt, & Weber, 2023). To thoroughly elucidate osseointegration, it is imperative to not only demonstrate this direct bone connection histologically but also to evaluate its clinical parameters. Accordingly, in this study, osseointegration was assessed through both clinical examinations and radiological analyses.

Sanchez pioneered the application of FA within the field of dentistry, marking a significant contribution to dental research. Their study was instrumental in identifying variations in FD pre- and post-implant placement, underscoring the potential of FA as a tool for assessing osseointegration (Sánchez & Uzcátegui, 2011). Subsequently, Lee et al. embarked on research aimed at delineating the association between primary implant stability and FD. Their findings elucidated a notable correlation between FD values and implant stability quotient (ISQ) scores, highlighting a stronger association in the mandible as opposed to the maxilla (Lee et al., 2010).

Willing et al. reported that FD scores in the peri-implant area exhibited an increase over up to 2 years following implant placement. They posited that FD scores could serve as a valuable diagnostic indicator in OPG for monitoring changes during the follow-up period (Wilding et al., 1995). Similarly, Mu et al. discovered a statistically significant alteration in the FD within the peri-implant region, comparing measurements taken just prior to implant loading with those obtained 12 months post-loading (Mu et al., 2013).

Despite demonstrating changes in alveolar bone during osseointegration, previous studies have not ascertained the impact of these changes on different jaws, various locations within the jaws, different genders, or the presence of systemic diseases. Our study significantly differs from previous research as it incorporates all these previously mentioned characteristics into its analysis. Sansare et al. demonstrated a significant increase in the bony microstructure around the implant and the number of bone trabeculae after osseointegration (Sansare, Singh, & Karjodkar, 2012). Soylu et al. reported a decrease in FD one week after implant surgery, followed by an increase at two months. Heo et al. observed a reduction in FD within three days after orthognathic surgery (Heo et al., 2002; Soylu et al., 2021). Similar findings were observed in the present study. Based on the results of these investigations, FD can serve as a predictive indicator for osseointegration in radiographic images.

In our study, the loading time was established as four months after implant placement. Considering the existing literature on loading times, Fischer et al. recommended waiting at least 8 weeks for osseointegration before proceeding to the prosthetic phase (Obamiyi et al., 2018). Bornstein et al. demonstrated that bone tissue integration could be observed for at least a three-week healing period after extraction, indicating sufficient osseointegration based on FA parameters (Bornstein, Hart, Halbritter, Morton, & Buser, 2009). Similarly, Balsi et al. concluded that extraction sockets require a two-month recovery period post-extraction to accumulate adequate bone tissue. In the present study, an increase in the FD value was observed four months after implant placement, aligning with these findings. (S. Balshi, Allen, Wolfinger, & T. Balshi, 2005).

Osseointegration is influenced by both bone metabolism and patient-related factors. Mangano et al. noted that bone metabolism may vary according to sex (F. Mangano, Oskouei, Paz, N. Mangano, & C. Mangano, 2018). August et al. further elucidated that low estrogen levels and associated bone alterations could constitute significant risk factors for endosseous implant failure (August, Chung, Chang, & Glowacki, 2001). However, Chen et al. showed that, although ISQ scores were lower in females compared to males, the difference was not statistically significant (Chen, Lyons, Tawse-Smith, & Ma, 2019). In our study, a statistically significant difference in FA was observed between males and females, specifically in the mesial-after and average-after measurements.

When reviewing the literature, it has been established through various studies that oral hygiene habits and smoking can influence osseointegration, with significant sex-related differences observed in these environmental factors (Castellanos & Cosano et al., 2019). Therefore, in our study, we conducted a gender-based analysis. Our current research is more comprehensive compared to the previously mentioned studies as it examines various jaws, locations within the jaws, gender-related factors, and elucidates their limitations more clearly. In this regard, our study stands out as unique.

Koh et al. asserted that the assessment of FA should be limited to the mandible, as the visibility of trabecular patterns is clearer in this region (Koh, Park, & Kim, 2012). Conversely, Diana et al. reported in their study that FA of the surrounding alveolar bone could be conducted on implants in both jaws, without distinguishing between the maxilla and mandible. In our study, we investigated the changes in FA in both jaws during osseointegration.

When analyzing the fundamentals of our study methodology and considering the local factors affecting osseointegration, it became apparent that teeth are situated in various locations within the alveolar bone, affecting outcomes (Ruggiero, Mehrotra, Rosenberg, & Engroff, 2004). Misc et al. discovered variations in bone quality across different jaws and locations within each jaw. Specifically, they found that the anterior mandible consisted of D2 bone, the posterior mandible and anterior maxilla were composed of D3 bone, and the posterior maxilla was made up of D3-D4 bone. Bone quality, influenced by numerous factors including trabecular structure and changes in bone architecture, can impact FA results (Ibrahim et al., 2014).

The present study identified statistically significant differences in FA between the maxilla and mandible. However, no statistically significant differences were observed between the anterior, premolar, or molar areas in the inter-jaw comparison. Based on the results observed within subgroups of these variables, the robustness of the findings was assessed through post-hoc tests. Future studies will aim to increase the sample size within these groups to obtain more precise results with higher power values, thereby enhancing the overall reliability and validity of the findings. To assert complete osseointegration in dental implant applications, it is necessary to demonstrate the bone-implant interface connection histologically alongside clinical parameters. However, this practice is often impractical in clinical settings. In this study, we evaluated osseointegration through clinical and radiological assessments; therefore, the term "osseointegration" in this context refers to clinical-level osseointegration or implant stability.

Limitations and Strengths

The strength of our study is that osteointegration can be evaluated clinically and radiologically. In addition, the maxilla and mandible were evaluated separately, and the jaws were further categorized into anterior, premolar, and molar regions. The current study had several limitations. Firstly, it included two FA assessments: one before and one after osseointegration. For a more comprehensive analysis, including a medium-term FA assessment is recommended. Secondly, including an additional parameter to assess implant stability, such as resonance frequency analysis measurements, would be beneficial.

CONCLUSIONS

FA serves as a reliable and non-intrusive method for identifying osseointegration within the peri-implant zone. Implementing this analysis in OPG images is believed to offer significant advantages to clinicians, particularly in terms of saving time and reducing costs.

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Conflict of Interest

No author has a conflict of interest.

Author Contributions

Plan, design: FA, TK; **Material, methods and data collection:** FA, TK, GI; **Data analysis and comments:** TK, GI; **Writing and corrections:** FA, GI.

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Ethical Approval

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