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The Effect of Religious Commitment Level of Women Over 40 Years on Their Perspectives on Cosmetic Surgery

40 Yaş Üstü Kadınların Dini Bağlılık Düzeylerinin Kozmetik Cerrahiye Bakış Açısına Etkisi

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ABSTRACT

Objective: With ageing, physical attractiveness decreases, and weight gain and wrinkles increase, which leads to an increase in the tendency towards plastic surgery. However, the level of religious attitude can influence this tendency. This study was conducted to determine the effect of the religious commitment level of women over 40 years on their perspectives on cosmetic surgery.

Materials and Methods: This descriptive and cross-sectional study was conducted with 452 women aged 40-65 who visited a hospital's outpatient clinic in Türkiye.

Results: It was determined that 61.5% of the women who participated in the study had a high religious commitment. The women with high levels of religious commitment were found to have a lower desire for cosmetic surgery ($p<0.001$).

Conclusion: The cosmetic surgery perspective was found to be adversely affected by the frequency of devotion and worship practices.

Keywords: Cosmetic surgery, nurse, religious commitment

ÖZ

Amaç: Yaşlanma ile birlikte fiziksel çekicilik azalır, kilo alımı ve kırışıklıklar artar, bu da estetik cerrahiye olan eğilimin artmasına neden olur. Ancak dini tutumun düzeyi bu eğilimi etkileyebilir.Bu çalışma, 40 yaş üstü kadınların dini bağlılık düzeylerinin kozmetik cerrahiye bakış açısına etkisini belirlemek amacıyla yapılmıştır.

Materyal ve Metot: Tanımlayıcı ve kesitsel tipte olan bu araştırma, Türkiye'de bir hastanenin polikliniğine başvuran 40-65 yaş arası 452 kadın ile yapılmıştır.

Bulgular: Araştırmaya katılan kadınların %61.5'inin dini bağlılığının yüksek olduğu belirlendi. Dini bağlılığı yüksek olan kadınların kozmetik cerrahi isteğinin daha düşük olduğu bulundu ($p<0,001$).

Sonuç: Estetik cerrahi bakış açısının ibadet ve ibadet uygulamalarının sıklığından olumsuz etkilendiği bulunmuştur.

Anahtar Kelimeler: Dini bağlılık, hemşire, kozmetik cerrahi

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INTRODUCTION

Religion is belief in God and practices and thoughts connected with this belief system.[1] Religious commitment is the degree of commitment of the individual to their religious values, beliefs, practices, and use in daily life.[2] When starting from this definition, it is assumed that an individual with high religious devotion will reflect the practices of religion more in his daily life.[3,4] Among the essential practices of Islam, prayer, fasting, and going to pilgrimage are mentioned in many of the verses of the Qur'an.[5] For this reason, as stated in many verses, worship can be regarded as a behaviour showing religious commitment. Religious beliefs that strongly affect the decisions and attitudes made in daily life do not only affect behaviours in many areas of life. For some, it also affects social interaction and interpersonal relationships as an integral part of identity during self-recognition and identification.[4] Studies examining how religion affects people's behaviours and health behaviours and the relationship between the concepts of religious life, level of being religious, and level of religious commitment and individuals' psychological state were conducted.[4,6] Along with this, there are also studies showing that attitudes toward plastic surgery are affected by religious factors.[1,7,8]

The perception of beauty and beautiful women varies across different age groups and cultures. Women have used the necessary opportunities to look aesthetically better and to be more beautiful for centuries.[9,10] In recent years, technological developments, advancements in dermatology and plastic surgery, the increase in the number of health centres, more accessible access to health centres for cosmetic surgery, and the decrease in the cost of aesthetic applications have increased the number of people undergoing cosmetic surgery.[10]

Many studies have revealed that positive attitudes towards plastic surgery increase as age increases.[11,12] With ageing, physical attraction decreases, and weight gain and wrinkles increase.[13] However, the perception of beauty and the importance of appearance remains the same. [14]

However, women may experience conflicting feelings between their desire to be beautiful and their religious views. This relationship has been examined in a limited number of studies.[7,15] For this reason, it is necessary to determine the relationship between women's religious attitudes and society's pressure to be beautiful and well-groomed. Based on this argument, we aimed to determine the relationship between the perspective on cosmetic surgery and the level of religious commitment in women over 40.

MATERIALS AND METHODS

Ethics Committee Approval: The study was approved by the Hitit University Non-Interventional Research Ethics Committee (Date: 27/02/2020, Decision no: 2020-29). The study was planned under the Helsinki Principles.

Design: This descriptive and cross-sectional study was carried out in February-May 2020 with women over 40 who visited a hospital's outpatient clinic in a city in the Black Sea region of Türkiye.

Participants: The study's target population consisted of 80.368 women between the ages of 40 and 65 living in the city centre where the research was conducted.[16] All women over 40 years of age who were informed about the purpose and method of the study and who met the study's inclusion criteria were included. The sample was selected among the target population using the random sampling method, and the effect size was calculated as 446, with a 0.05 significance level and 0.95044 power.

Procedure: Written and verbal consent were obtained from the women who agreed to participate in the study, and the participants signed an informed consent form. The researcher collected the data through the face-to-face data collection method. The research was completed with 452 women.

Women between the ages of 40-65 who did not have plastic surgery before, who had no communication difficulties or mental disabilities, who volunteered to participate in the study, and who did not have any psychiatric or oncological diseases were included. Women who did not meet the inclusion criteria were excluded from the study.

The study's dependent variable was determined as the total Acceptance of Cosmetic Surgery Scale (ACSS) score and the personal, social and thoughts sub-dimension scores. The leading independent variable was the Adaptation of Religious Commitment Scale (ARCS), and other independent variables were determined as religious opinion, fasting, praying, and pilgrimage.

Instrumentation: The questionnaire form the researchers prepared based on the literature[7,8] was used as the first data collection tool. Other forms used in the data collection process are the ACSS and the ARCS.

The Questionnaire Form; Includes a total of 10 questions regarding the socio-demographic characteristics of the participants (age, marital status, education level, etc.), the individual's perception of their own religious belief (conservative, moderate), and the religious practices of praying, pilgrimage, and fasting.

The ACSS was developed by Henderson-King and Henderson-King, and was adapted to Turkish by Karaca et al. in 2017.[17,18] It determines the attitudes of individuals toward cosmetic surgery and includes a total of 15 items. The scale is a 7-point Likert scale

that can be evaluated according to the three sub-dimension scores and the total scale score. The score range of the ACSS is 15-105. The increase in the sub-dimension scores and the total scale score indicates positive attitudes towards cosmetic surgery. The sub-dimensions of the scale are the personal sub -dimension (Items 1-2-4-5-14), the social sub-dimension (Items 9-11-l2-13-l5), and the thoughts sub-dimension (Items 3-6-7-8-l0) (Item 10 is a reverse item). The personal sub-dimension includes evaluations about appearance, which motivate cosmetic surgery. In contrast, the social sub-dimension involves individuals' feelings about their social relationships and environment, which affect their attitudes towards cosmetic surgery. The thoughts sub-dimension includes individuals' opinions about cosmetic surgery. In the study of Henderson-King and Henderson-King, the scale's internal consistency was found to be between 0.91 and 0.93.[17,18] In our study, Cronbach's alpha was determined as 0.88 for the personal sub-dimension, 0.89 for the social sub-dimension, and 0.84 for the thoughts sub-dimension. The Cronbach's alpha for the whole scale was 0.93.

The ARCS developed by Worthington et al. determines individuals' religious commitment levels and includes 10 items.[2] It was translated into Turkish by Akın et al.[4] The ARCS is a 5-point Likert scale comprising two sub-dimensions. The sub-dimensions are the individual religious commitment (sum of the scores from the 1., 3., 4., 5., 7. and 8. questions) and the interpersonal religious commitment (sum of the scores from questions 2., 6., 9. and 10. questions). Cronbach's alpha was calculated at 0.85 for the full scale. The corrected item-total correlation coefficients of the scale rank between 0.37 and 0.69. In our study, Cronbach's alpha of the scale was found to be 0.91.

Data Analysis: BM SPSS 22 package program was used to analyze the data. Descriptive statistics were calculated according to the distribution of the data. The descriptive statistics of the categorical data were presented as numbers (n) and percentages (%). The Shapiro-Wilk Test was used to determine whether the data showed normal distribution. Non-parametric Mann–Whitney U test was used to compare the scale scores of two independent groups. The scale score comparison of more than two independent groups was performed using the non-parametric Kruskal-Wallis test. The Spearman correlation was calculated to determine the relationship between the level of religious commitment and aesthetic attitudes. P value was used $p<0.05$.

RESULTS

The mean age of the women (n=452) who participated in the study was 47.56±7.70 63.5% of the women were between 40-49 years old; more than half (50.9%) were primary school graduates, and most (81.4%) were married (Table 1).

Table 1. Sociodemographic characteristics of the women (n=452).

Characteristics		n (%)
Age group	40-49	287 (63.5)
	50-59	116 (25.7)
	60 or ↑	49 (10.8)
X±SD	47.56±7.70±6	
Marital status	Married	368 (81.4)
	Single	64 (18.6)
Educational status	Literate (no formal degree)	58 (12.8)
	Primary school	230 (50.9)
	High school	86 (19.0)
	Undergraduate	78 (17.3)
Working condition	Working	334 (73.9)
	Not working	118 (26.1)
Has a children	Yes	410 (90.7)
	No	42 (9.3)
Has a chronic disease	Yes	240 (53.1)
	No	212 (46.9)
Total		452 (100)

Approximately half of the women (48.2%) defined themselves as conservative. While most participants (74.8%) stated that they fast, 57.5% reported that they regularly practice five prayers; 79.6% stated that they want to go on pilgrimage, and 8.8% went on pilgrimage before. In our study, the total ARCS score of the participants was calculated as 33.89±9.93 (Table 2).

The ACSS personal sub-dimension score of the participants was found to be 16.27±9.07 (median=15), while the ACSS social sub-dimension score was 11.20±7.97 (median=7), and the thoughts sub-dimension score was 14.49±8.77 (median=12). The total ACSS score was calculated as 41.96±23.10 (median=35.5) (Table 3).

Table 2. Distribution of religious attitudes of the participants.

Variables	Groups	n (%)
Religion Belief	Conservative	218 (48.2)
	Mild	234 (51.8)
	No	40 (8.8)
Fasting	Sometimes	74 (16.4)
	During Ramadan	338 (74.8)
	No	70 (15.5)
Prayer	Sometimes	122 (27.0)
	Five Times a Day	260 (57.5)
	I Want	360 (79.6)
Go to pilgrimage	I went before	40 (8.8)
	I do not want	52 (11.5)
Total Score of ARCS, Mean ± SD	33.89 ± 9.93	

ARCS: Adaptation of Religious Commitment Scale.

Table 3. Distribution of participants' scores in acceptance of osmetic Surgery Scale.

	Personal sub-dimension	Social sub-dimension	Thoughts sub-dimension	Total score
X±SD	16.27±9.07	11.20±7.97	14.49±8.77	41.96 ± 23.10
Median	15	7	12	35.5
Min-Max	5-35	5-35	5-35	15-105

X±SD: Mean±Standard Deviation.

Table 4 compares the participants' ACSS total and sub-dimension scores according to their religious attitudes. It is seen that the ACSS personal, social, and thoughts sub-dimension scores and the ACSS total score show a statistically significant difference between women who express their religious views as conservative and moderate ($p<0.001$). The women who defined themselves as conservative had lower ACSS scores than those with moderate religious opinions. Regarding the participants' fasting frequency, the difference between the personal, social, and thoughts sub-dimensions and the total ACSS score was found statistically significant ($p<0.001$). The personal, social and thoughts sub-dimension scores and the ACSS total score of the women who stated that they regularly fast during Ramadan were lower than the women who do not or sometimes do. Regarding the frequency of performing prayers, the difference between the personal, social, and thoughts sub-dimensions and the total ACSS score was found to be statistically significant ($p<0.001$). The women who perform five prayers daily had lower personal, social, and thought sub-dimension scores and lower total ACSS scores than those who do not pray or sometimes do the prayer. As for the desire to go on pilgrimage, the difference between the personal, social, and thoughts sub-dimension scores and the total ACSS score was statistically significant ($p<0.001$). The women who did not want to go on pilgrimage had lower personal, social and thoughts sub-dimension scores and total ACSS scores (Table 4).

The study determined the bilateral correlation between the participants' total ACSS score, personal, social and thoughts sub-dimension scores, and religious commitment level. As the participants' ARCS score increased, the total ACSS score and the personal, social and thoughts sub-dimension scores decreased. As a result of the correlation analysis, negative, weak and moderate relations were determined between ACSS sub-dimensions and ARSS. This shows middle-aged women with high religious

Table 4. Comparison of the total and sub-dimension scores of Acceptance of Cosmetic Surgery Scale according to the religious attitudes of the participants.

Religious Opinions		Religious View		Fasting Frequency			Prayer Frequency			Going Topilgrimage		
ACSS Total and Sub-dimensions		Conserva-tive	Moderate	None	Sometimes	Regularly	None	Sometimes	Regularly	Do not want	Want	Went
Personal	n	218	234	40	74	338	70	122	260	52	360	40
	Median	11	20	22	22	13	21	20	11.5	22	14	10,5
	X±SD	13.28±7.41	19.05±9.60	20.50±10.35	20.57±10.25	14.83±8.17	19.00±10.97	19.26±8.73	14.13±8.05	21.46±8.94	15.95±9.001	12.40±6.95
	Test	MU=16862.000			KW:24.691			KW:29.568			KW:21.886	
	Value	p<0.001**			p<0.001**			p<0.001**			p<0.001**	
Social	n	218	234	40	74	338	70	122	260	52	360	40
	Median	6	11	12	12	6	7	11	6	15.5	7	5.5
	X±SD	9.08±6.30	13.18±8.83	13.95±9.38	14.95±9.44	10.06±7.09	12.03±8.28	14.11±9.07	9.62±6.88	15.81±9.02	10.69±7.65	9.80±7.57
	Test	MU=19232.000			KW: 23.067			KW: 30.364			KW: 18.055	
	Value	p<0.001**			p<0.001*			p<0.001**			p<0.001**	
Thoughts	n	218	234	40	74	338	70	122	260	52	360	40
	Median	11	16	16.5	20	11	15	17	11	19,5	12	6
	X±SD	11.0±6.59	17.59±9.41	20.15±10.08	20.11±8.82	12.59±7.75	18.06±9.77	18.33±8.90	11.72±7.32	21.15±8.21	14.04±8.60	9.80±6.12
	Test	MU=15070.000			KW: 57.778			KW: 62.585			KW: 42.405	
	Value	p<0.001**			p<0.001**			p<0.001**			p<0.001**	
Total ACSS	n	218	234	40	74	338	70	122	260	52	360	40
	Median	28	46	54	50	33	50	47	28.5	54	35	24.5
	X±SD	33.52±17.20	49.82±25.07	54.60±26.57	55.62±25.60	37.47±20.25	49.09±26.48	51.70±23.97	35.47±41.96	58.42±23.36	40.69±22.43	32.00±18.56
	Test	MU=15646.000			KW:40.876			KW:49.653			KW:35.679	
	Value	p<0.001**			p<0.001**			p<0.001**			p<0.001**	

MU: Mann–Whitney U test statistics; KW: Kruskal Wallis test statistics; **: p<0.001; X±SD: Mean±Standard Deviation; ACSS: Acceptance of Cosmetic Surgery Scale.

commitments do not want cosmetic surgery. They disapprove of cosmetic surgery (Table 5).

DISCUSSION AND CONCLUSION

Most religious views disapproved of surgical operations for cosmetic reasons until the early 20th century. Since all kinds of health and physical problems are accepted as a sign of divine power, correcting the shape ordained by Allah was not considered appropriate.[15] However, individual factors such as the increase in the importance given to physical appearance with the influence of Western culture, the acceptance of aesthetic surgery practices by society, the support given by the media to aesthetic surgery and aesthetics, and the negative perception of body image have increased the interest in aesthetic surgery.[10] In this study, we aimed to determine the perspectives of women over 40 on plastic surgery, which individuals are increasingly interested in, and how their religious commitment levels affect their perspectives on plastic surgery.

As a universal phenomenon, religion affects interpersonal relationships, individuals' behaviours, attitudes and lives. Whether an individual is religious or not can be determined by the individual's religious attitudes and behaviours.[19] The participants' ARCS total score was high (Table 2). This shows that the women participating in the research primarily have stronger religious attitudes. In addition, the fact that the women included in the study were 40 years or older may also have affected this result. Sarı's study states that the rate of regular fulfilment of religious practices increases with age.[3] It is stated that young people see death as more distant and delay the regular practice of religious practices until later ages.[3]

Those who adopt the Islamic philosophy divide aesthetic surgery into necessary surgery, which is necessary to correct congenital or later defects, and surgery for beautification. While basic surgery seems religiously permissible, surgery to beautify is not considered appropriate. For, in the Qur'an, "We have indeed created man in the best form" 95/4.[1,20,21] According to Islam, a person should accept the body Allah gave him because the creator created the body most beautifully. Having healthy organs is enough for a person to thank God.[1,7] The ACSS score, which indicates the willingness of the participants to have plastic surgery, was found below the medium level (Table 3). To make women look better, It is reported that there is an increase in the desire to change the body appearance with aesthetic applications.[10,17] The reason for our study results may be that young people show more interest in plastic surgery practices than middle-aged women. However, women with high religious devotion stay away from plastic surgery as an indication of their approval of the shape created by Allah.

In studies, it is stated that individuals have a better appearance and feel better with aesthetic applications. For example, the study of Dogan and Yassa determined that 43.7% of women who undergo labiaplasty surgery are willing to undergo surgery for a better appearance.[22] A study conducted with 22 women who had tummy tuck surgery determined they were satisfied with their appearance in front of the mirror six months after the surgery. Their quality of life and mental health were positively affected, is reported.[23] Unlike these studies, in our results, it is seen that women who define themselves as conservative, who regularly pray, fast and go on pilgrimage, have low motivation for plastic surgery about their appearance, think that aesthetic surgery has a low effect on social communication, and have a low desire to have plastic surgery (Table 4). Spearman correlation analysis results show a significant negative relationship between women's religious commitment levels, worship practices, and aesthetic surgery attitudes (Table 5). Similarly, in the study of Muslu and Demir, a significant relationship was determined between worship practices and aesthetic surgery attitudes.[7] It is thought that these results are due to the positive effect of religiosity on life satisfaction and the Islamic religion's disapproval of aesthetic surgery for beautification.[1,6,7,15,20] At

Table 5. Relationship between acceptance of Cosmetic Surgery Scale and adaptation of Religious Commitment Scale Correlation.

Pearson Correlation (r)	Total ACCS Score	Total ARCS Score	Personal	Social	Thoughts
Total ACCS Score	1	-0.363**	0.890**	0.868**	0.923**
Total ARCS Score		1	-0.318**	-0.260**	-0.392**
Personal			1	0.625**	0.742**
Social				1	0.729**
Thoughts					1

r: Correlation coefficient -1 < r < +1; Low Level Correlation: 0.01< r <-0.29; Medium Level Correlation: 0.30< r <-0.70; **: Correlation is significant at the 0.01 level; ACSS: Acceptance of Cosmetic Surgery Scale; ARCS: Adaptation of Religious Commitment Scale Correlation.

the same time, Okumus also stated in his study that the individual's motivation, economic and psychological status, and socio-cultural structure affect decision-making on aesthetic surgery. Still, religion affects the final decision.[8] For this reason, nurses should evaluate women's religious commitment levels and plan their care holistically to increase the quality of care and patient satisfaction. In addition, recognizing the motivating factors behind the decision to apply for plastic surgery is extremely important for recovery and psychological outcomes in the postoperative period.

In conclusion, a significant relationship exists between women's religious commitment levels, worship practices, and cosmetic surgery attitudes. Their attitude towards cosmetic surgery is adversely affected by the frequency of devotion and worship practices. Addressing patients' physical and psychosocial needs during the perioperative process may increase the quality of care and patient satisfaction. Nurses should evaluate the level of religious commitment of women and plan their care with a holistic approach to improve the quality of care and patient satisfaction. Moreover, they should conduct studies to examine the effect of religious attitudes on the perioperative process in patients undergoing aesthetic surgery. The study has some limitations. The sample size is small, and the study is a single-centre study. The significance of the study is that it is the first study conducted with Turkish women over 40 years old. Unlike previous studies, women's religious commitment levels and worship practices were evaluated with a standard scale.

Ethics Committee Approval: This study was planned following the Helsinki Principles, and ethical approval was obtained from the Hitit University Non-Interventional Research Ethics Committee (Date 27.02.2020, decision no: 2020-29).

Conflict of Interest: No conflict of interest was declared by the authors.

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Determining the Psychometric Properties of the Turkish Version of the Nurses' Alarm Fatigue Questionnaire

Hemşirelerin Alarm Yorgunluğu Ölçeği'nin Türkçe Psikometrik Özelliklerinin Belirlenmesi

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ABSTRACT

Objective: This study was conducted to examine the psychometric properties of the Nurses' Alarm Fatigue Questionnaire.

Materials and Methods: In this methodological study, the sample consisted of 142 nurses working in neonatal and pediatric intensive care. In order to test the psychometric properties of the scale, language equivalence, content and construct validity were used for validity analysis. The data were evaluated using descriptive and confirmative factor analyses, Cronbach's alpha, split-half, and item-total score correlation.

Results: The total explained variance of the Turkish version of the Nurses' Alarm Fatigue Questionnaire consisting of a single sub-dimension and nine items was determined as 41%. The total factor loading was >0.30. In the confirmatory factor analysis, all the goodness of fit indexes were >0.90, and the root mean square error of approximation (RMSEA) was <0.08. The correlation between the two halves was 0.71, and the Guttman split-half and Spearman-Brown coefficients were 0.83. The Cronbach's alpha coefficient for the scale was found to be 0.80.

Conclusion: The study's findings suggest that the scale is a valid and reliable tool in determining the alarm fatigue of nurses working in newborn and pediatric intensive care units in Türkiye.

Keywords: Alarm fatigue, nurses, reliability, validity

ÖZ

Amaç: Bu çalışma Hemşirelerin Alarm Yorgunluğu Ölçeği'nin psikometrik özelliklerini incelemek amacıyla yapılmıştır.

Materyal ve Metot: Metodolojik çalışmanın örneklemini yenidoğan ve çocuk yoğun bakımlarında çalışan toplam 142 hemşire oluşturmuştur. Ölçeğin psikometrik özelliklerinin geçerlik analizinde dil eşdeğerliği, içerik ve yapı geçerliliği kullanılmıştır. Veriler açımlayıcı ve doğrulayıcı faktör analizleri, Cronbach alfa katsayısı, iki yarı tekniği ve madde-toplam korelasyonu kullanılarak değerlendirilmiştir.

Bulgular: Bir alt boyut ve dokuz maddeden oluşan Hemşirelerin Alarm Yorgunluğu Ölçeği'nin Türkçe formunun açıklanan toplam varyansı %41 olarak belirlenmiştir. Toplam faktör yükü >0,30'dur. Doğrulayıcı faktör analizinde, tüm model uyum indeksleri >0,90 ve yaklaşık hataların ortalama karekökü (RMSEA) <0,08'dir. İki yarı arasındaki korelasyon 0,71, Guttman ve Spearman-Brown katsayıları 0,83'tür. Cronbach alfa değeri 0,80 olarak bulunmuştur.

Sonuç: Araştırmanın bulguları, ölçeğin Türkiye'de yenidoğan ve çocuk yoğun bakım ünitelerinde çalışan hemşirelerin alarm yorgunluğunu belirlemede geçerli ve güvenilir bir araç olduğunu göstermektedir.

Anahtar Kelimeler: Alarm yorgunluğu, geçerlik, güvenirlik, hemşire

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INTRODUCTION

Alarm fatigue is caused by the high frequency of alarms and actual sound, as well as an excess of out-of-process and false alarm signals generated by machinery in a patient care unit.[1] Alarm response accounts for 35% of nurses' work time in an intensive care unit (ICU).[2]

Alarm fatigue is a cognitive stress control technique that results in solutions such as disabling alarms, muting the alarm too low, delaying the response to alarms, or setting device parameters to unsafe values.[3,4] While alarms are important and sometimes life-saving, they can endanger patients' safety if ignored.[5] When so many alarms are generated, it is difficult to know which alarms are important or vital to the patient's health.[6] The majority of clinically nonactionable alarms raised overload clinicians and the care delivery system, resulting in missed instability and threatening patient safety (Hravnak, Johnson). Also, it leads to a decrease in productivity and has a detrimental impact on nurses' concentration.[7] According to the U.S. Food and Drug Administration's (FDA) Manufacturer and User Facility Device Experience (MAUDE) database, between 2005 and 2010, 566 alarm-related patient deaths were documented.[8] Moreover, alarm, alert, and notification overload have been identified as the sixth health technology risk for 2020 by the Emergency Care Research Institute (ECRI).[9]

Being aware of the effect of alarm fatigue on nurses and patients, nurses are an important health discipline that can plan strategies to reduce alarm hazards, especially regarding patient safety. For this reason, it is important to identify and inform nurses about their impact on this issue. A measurement tool was needed to measure alarm fatigue for nurses to take the necessary precautions to provide care in a quality environment and for patient and nurse safety. In particular, it is useful to determine alarm fatigue in nurses working in newborn and pediatric ICUs with different physiological structures and needs. Therefore, this study aims to perform the Turkish validity and reliability study of the Nurses' Alarm Fatigue Questionnaire.

MATERIALS AND METHODS

***Ethical Considerations*:** The study was carried out by the Helsinki declaration. Ethics committee approval Pamukkale University Non-Invasive Research Ethics Committee (Date: 06/09/2018, decision no: 17), and written consent was obtained.

***Setting and Sample*:** This methodological cross-sectional study involved nurses who worked in neonatal and pediatric intensive care units. The population of the study consisted of nurses working in the pediatric intensive care unit and neonatal intensive care unit in two hospitals in İzmir. In determining the sample of the study, it is recommended to take 5-10 times the scale items.[10] It was aimed to reach 130 nurses who are 10 times of the scale items. The study's sample included 142 nurses, with the addition of 10% for losses.

***Data Collection*:** The study was carried out with the survey method. Data were collected through face-to-face interviews. The sociodemographic form and Nurses' Alarm Fatigue Questionnaire were used for data collection. The original questionnaire was developed by Torabizadeh et al.[7] consists of 13 items. The scale's items are assessed on a 5-point Likert scale, with 0 indicating "Never" and 4 indicating "Always". The scale has no subscales, and items 1 and 4 are reverse-scored. The scale has a minimum of 8 points and a maximum of 44 points. Alarm fatigue, which impacts nurses' performance, is indicated by a high score on the scale.

***Language Equivalence*:** Two academics with advanced levels of English, a linguist, and an educator who lives abroad and speaks English as a native language independently translated the scale from English to Turkish for the language validity of the scale. The researchers examined all of the translations and combined them into a single document, and subsequently, the Turkish version of the questionnaire was translated back from Turkish to English.

The Content Validity: The Turkish version of the questionnaire was sent to 13 experts (seven nurse academicians, six PICU and NICU specialist physicians and nurses). CVR values are calculated using the formula: CVR= (Ne/ N-2) / (N/2). "Ne" in the formula indicates the number of experts who selected the appropriate option, "N" indicates the number of experts who participated in the study. The content validity ratio (CVR) value should be at least 0.54; values below this value should be excluded from the study.[11] The CVR of the 13-item scale was found to be 0.57. Items 1, 4, 5 and 9 with a CVR value less than 0.54 were excluded from the scale.

The Construct Validity: Confirmatory factor analyses (CFA) and explanatory factor analysis (EFA) using principal component analysis were performed. In the principal component analysis, components with an eigenvalue in excess of 1 were evaluated.

***Statistical Analysis*:** Means, standard deviations, numbers, and percentages were used to evaluate the descriptive data. The validity analyses were conducted using language equivalency, content validity, and construct validity. Quantitative content validity was assessed based on Lawshe's content validity ratio (CVR).

The measure's construct validity was determined using exploratory factor analyses (EFA) and confirmatory factor analyses (CFA). Using principal com-

ponent analysis, EFA was used to determine the relationship between the item and the factor. Prior to performing the EFA, the Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity were used to assess whether the data were adequate for factor analysis. CFA was employed to determine whether the factor structure of an original version of a scale was consistent with its modified form. Model fit indices were used to assess model fit: $\chi 2/df$ where less than 3 is a good fit, root mean square error of approximation (RMSEA) values of 0.05 and less designate a good fit while between 0.05 and 0.08 is adequate to fit, Normed fit index (NFI), Non-normed fit index (NNFI) and Comparative fit index (CFI) where a value of ≥0.95 is considered a good fit, Goodness-of-fit index (GFI) and Adjusted Goodness of Fit Index (AGFI) where a value of ≥0.90 is regarded as a good fit.

The item-to-total correlation (Pearson correlation), and Cronbach's alpha coefficient were calculated, and the split-half technique (Spearman-Brown and Guttman split-half values) was used to evaluate the internal consistency and reliability of the questionnaire. The CFA was performed using LISREL 8.8, and the remaining analyses were performed using the IBM SPSS (version 21.0).

RESULTS

Among the nurses who participated in the study, 91.5% were female, 41.5% were between 25 to 30 years old, 51.6% (n = 94) were married, and 55.6% had a bachelor's degree. In addition, 31.0% of the participants have been working in nursing for 6 to 10 years, 88.0% work on night and day shifts, 44.3% work between 36 and 48 hours per week, 57% work in the neonatal intensive care unit and 50.7% of them worked in intensive care for 0 to 5 years (Table 1).

The calculated KMO was 0.82, and Bartlett's Test of Sphericity was $\chi 2 = 405.969$ ($p<0.001$). In the principal component analysis, components with an eigenvalue in excess of 1 were evaluated. The questionnaire was found to have a structure of 2 factors with eigenvalues in excess of 1: factor 1, with an eigenvalue of 3.69, accounted for 41% of the total variance; factor 2, with an eigenvalue of 1.07, accounted for 11% of the total variance, and this structure of two factors accounted for 53% of the total variance. As a result of the component matrix that was made to determine the items in each factor and their

Table 1. Sociodemographic characteristics.

Characteristics		n (%)
Gender	Female	130 (91.5)
	Male	12 (8.5)
Age (years)	19-24	23 (16.2)
	25-30	59 (41.5)
	31-36	25 (17.6)
	37-40	25 (17.6)
	More than 41	10 (7.1)
Marital status	Married	73 (51.4)
	Single	69 (48.6)
Education	Health Vocational High School	23 (16.2)
	Associate degree	25 (17.6)
	Bachelor's degree	79 (55.6)
	Master's degree	15 (10.6)
Working year	0-1 years	15 (10.5)
	2-5 years	38 (26.8)
	6-10 years	44 (31.0)
	11-20 years	39 (27.5)
	More than 21 years	6 (4.2)
Working shift	Night and day shift	125 (88.0)
	Day shift	11 (7.8)
	Night shift	6 (4.2)
Weekly working hours, (h)	36-45	112 (44.3)
	46-55	20 (39.5)
	56-65	16 (11.3)
	More than 66	7 (4.9)
Unit	Pediatric Intensive Care Unit	61 (43)
	Neonatal Intensive Care Unit	81 (57)
Working years in ICU	0-5 years	72 (50.7)
	6-10 years	52 (36.6)
	More than 10 years	18 (12.7)

factor loads, it was found that the items were loaded on a single factor. The scale was evaluated on a single dimension with an eigenvalue of 3.69 and accounted for 41% of the total variance. The factor loads of the scale items in this study ranged from 0.36 to 0.87 (Table 2).

Following the CFA, the goodness-of-fit indexes of the one-factor model were good; nonetheless, the model suggested a modification between items 7 and 13. The inter-item modification indices were reassessed after the CFA, and a PATH diagram was drawn by establishing covariance between the 7th and 13th items. Figure 1 illustrates the modified PATH diagram.

Table 2. Principal factors of Nurses' Alarm Fatigue Questionnaire Items (N = 142).

	Factor Loads
Item number	**Factor 1**
Item 11	0.87
Item 8	0.81
Item 12	0.81
Item 6	0.64
Item 3	0.60
Item 13	0.50
Item 7	0.48
Item 10	0.45
Item 2	0.36
Percentage of variance explained (%)	41
Eigenvalue	3.69
Kaiser–Meyer–Olkin	0.82
Bartlett $\chi 2$, p	405.969, p = 0.000

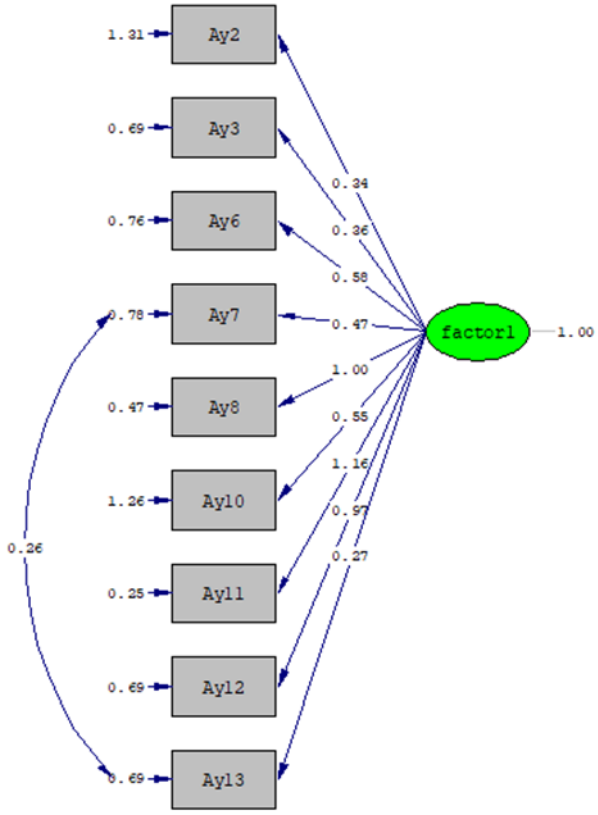

Figure 1. Modified PATH diagram.

Following the modification, better goodness of fit values were obtained. Before and after modification, the goodness of fit indexes was given in Table 3.
The Cronbach's alpha value was found to be 0.80. The total item correlation of all scale items was between 0.27 and 0.77. The correlation between the two halves was 0.71, the Guttman split-half and Spearman-Brown coefficients were 0.83, and the average score was 14.97 ± 6.35 (Table 4).

Table 3. CFA goodness of fit indexes.

Model	χ2/sd	RMSEA	NFI	NNFI	CFI	GFI	AGFI
Before modification	1.66	0.06	0.92	0.96	0.97	0.93	0.89
After modification	1.11	0.02	0.95	0.99	1.00	0.96	0.92

RMSEA: Root mean square error of approximation; NFI: Normed fit index; NNFI: Nonnormed fit index; CFI: Comparative fit index; GFI: Goodness of fit index; AGFI: Adjusted goodness of fit index.

Table 4. Results of scale reliability.

	Cronbach's α	Spearman's Brown	Guttman split-half	Correlation between two halves	M ± SD (Min-Max)
Total scale	0.80	0.83	0.83	0.71	14.97 ± 6.35 (2-32)

DISCUSSION AND CONCLUSION

The complexity of setting the alarms, limited training and false alarms may have serious consequences for both patients and nurses.[12] Alerts and alarms impact clinical care, as alerts and alarms by design interrupt clinical workflow.[13] Nurses and health professionals feel overburdened with an excessive amount of duties and a continuous wave of alarms. Intensive care nurses cannot spare enough time for the care of patients due to burdensome and frequent alarms, and their trust in alarm systems decreases.[1] As the false alarm rate increased, the response rate of nurses to these alarms decreased.[14] One study revealed that more than 50% of alarms were irrelevant.[15] Also, alarm fatigue has an impact on nurses' social life, sleep, intolerance to sounds and level of social activities in their personal life.[16] These situations endanger patient safety. To ensure patient safety, intensive care nurses must stay current with technological advancements through alarm-specific training.[12]
The content validity of the scale was evaluated by thirteen experts, and CVR was used to evaluate the expert opinions. The CVR value must be at least 0.54, and values below this should be excluded from the study.[11] Items 1, 4, 5 and 9 with a CVR value less than 0.54 were excluded from the scale. The Turkish version had nine items in total after four items were removed. In the current study, the results of CVR showed that the content validity was ensured.
EFA and CFA analyses were used to assess the construct validity of the Turkish version of the Nurses' Alarm Fatigue Questionnaire. KMO and Bartlett's test of sphericity were used to assess whether the data were appropriate and sufficient for factor analysis.[10] In the literature, the calculated KMO must be 0.60 or higher proceeding with factor analysis and Bartlett's test of sphericity value should be statistically significant.[11,17,18] In this study, the KMO coefficient was >60 and Bartlett's test χ2 value <0.05. Our results showed that the sample was suitable for factor analysis. This study's sampling size and data sets were similar to those of the original[7] and Chinese[19] versions.
Kaiser Criterion, the most commonly used eigenvalue criteria, states that factors should be retained if their eigenvalues are greater than or equal to one, was used for extracting the factors.[20] As a result of the component matrix that was made to determine the items in each factor and their factor loads, it was found that the items were loaded on a single factor. When evaluating a scale in a single dimension; a) Eigenvalue of the first factor should be 3 times greater than the eigenvalue of the second factor. Although the scale appeared to be 2-dimensional, it was evaluated in a single factor because the eigenvalue (3.69) of the first factor was 3.45 times greater than the eigenvalue (1.07) of the second. b) The variance explained by the first factor is remarkable. c) The

variances described in single-factor scales must be 30% or more, and those described in multifactor scales must be greater.[21] The scale was evaluated on a single dimension and accounted for 41% of the total variance can be interpreted as an indication that the scale adequately measures nurses' alarm fatigue. In the Chinese version, after four common factors were extracted by exploratory factor analysis, the cumulative variance contribution rate was 59.568%.[19]

As a result of the EFA, the factor loads of the scale items in this study ranged from 0.36 to 0.87. According to the literature, the minimum factor load should be 0.30 and above, and items below 0.30 should be removed from the scale.[17,21] In this study, the factor loads were >0.30. The factor loadings ranged from 0.43 to 0.99 in the original study,[7] and 0.49 to 0.80 in the Chinese version.[19] In this study, since the factor loads of all items were greater than 0.30 the scale had valid and strong construct validity for the Turkish sample.

The literature suggests performing CFA, which aims to explore how well a predefined theoretical model "fits" the collected data.[22] Goodness of fit indexes were used to evaluate the model's goodness of fit. The RMSEA values of 0.05 and less designate a good fit, while between 0.05 and 0.08 is an adequate fit. The NFI, NNFI and CFI scores of more than 0.95 indicate good- fitting, whereas a score of more than 0.90 and 0.95, respectively, indicates acceptable-fitting. GFI and ANGFI scores of more than 0.90 indicate good-fitting, whereas a score of more than 0.85 indicates acceptable-fitting.[23,24] When the value derived from the ratio of the $\chi 2$ value to the degree of freedom (df) is less than three, good fit is suggested, and when the value is less than five, a satisfactory fit is indicated.[25] In this study, it was determined that the $\chi 2$/df value was less than three, the RMSEA was < 0.08, the NFI, NNFI, and CFI indices were >0.95, and the GFI and AGFI indices were >0.90. All of the goodness of fit indices indicated good concordance in this study. Our CFA results were consistent with the criteria stated in the literature. Both in the original[7] and adaptation studies,[15,19] the results could not be compared since the analysis of CFA could not be carried out. The results of the CFA indicate that the data were consistent with the model and confirmed the one-factor structure. Supporting the scale's construct validity, the results of the EFA and CFA in the current study suggest that a scale is a valid tool.

An important and widely used measure for assessing the internal consistency of a set of items is Cronbach's coefficient. Values for Cronbach's alpha should range between 0 and 1, with higher values indicating greater reliability among the items in the set.[20] The Cronbach's alpha value was found to be 0.80. The original scale's Cronbach's alpha value was found to be 0.91.[7] In the Chinese version, it was reported as 0.77,[19] and in the Arabic version, it was 0.91.[15] Item-total score correlation, Guttman split-half and Spearman-Brown coefficients are another analyzes to determine internal consistency. It is recommended that items with a correlation coefficient should be over 0.20.[10] Total item correlation of all scale items was between 0.27 and 0.77. The Guttman split-half and Spearman-Brown coefficients were 0.83. In the original study of the scale, they were 0.79 and 0.99, respectively[7] and, in the Chinese study split-half coefficient was 0.79.[19]

In conclusion, in this study, it was found that the Turkish version of the Nurses' Alarm Fatigue Questionnaire had sufficient validity and reliability. It can be said that the scale has sufficient psychometric properties to evaluate the alarm fatigue of nurses in newborn and pediatric intensive care units in our country. It is recommended that this scale be used in programs to be planned to examine the factors affecting alarm fatigue, to conduct studies with large samples, and to reduce the problems associated with alarm fatigue. In another study, the validity and reliability of the alarm fatigue scale were found to be sufficient.[26]

Ethics Committee Approval: Our study was approved by the Pamukkale University Non-Interventional Clinical Research Ethics Committee (Date: 06/09/2018, decision no: 17). The study was carried out by the Helsinki declaration.

Conflict of Interest: No conflict of interest was declared by the authors.

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Morphologic and Morphometric Evaluation of the Acetabulum

Acetabulum'un Morfolojik ve Morfometrik Olarak Değerlendirilmesi

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ABSTRACT

Objective: The aim of this study is to reveal the morphological and morphometric features of the acetabulum and to compare them with the current literature.

Materials and Methods: A total of 57 coxae (29 left, 28 right) were examined. The anterior ridge of the acetabulum was classified as curved, straight, angular, and irregular according to its morphological features and the transverse diameter of the acetabulum (TD), the vertical diameter of the acetabulum (VD), the anteroposterior diameter of the acetabulum (APD), acetabular depth (AD), acetabular notch width (ANW) and os coxae height (CH) were measured.

Results: The types of the anterior ridge of the acetabulum were found as 19 (33.3%) straight, 18 (31.6%) curved, 14 (24.6%) angular, and 6 (10.5%) irregular in shape. The mean values of the TD, VD, APD, ANW, AD and CH were 50.67±3.12 mm, 52.21±3.52 mm, 52.66±3.73 mm, 22.64±2.67 mm, 29.75±2.28 mm and 206.33±11.70 mm respectively. No significant difference was found between the right and left coxae in terms of the measured parameters ($p>0.05$). There was only a difference between the shapes and the depth of the acetabulum ($p<0.05$).

Conclusion: Knowing the normal anatomy of the acetabulum is important in preventing complications during surgical procedures of this area.

Keywords: Acetabulum, anatomy, anterior ridge, hip prosthesis, morphometry

ÖZ

Amaç: Bu çalışmanın amacı acetabulum'un morfolojik ve morfometrik özelliklerini ortaya koymak ve literatürde yapılan benzer çalışmalar ile karşılaştırmaktır.

Materyal ve Metot: Toplam 57 os coxae (29 sol, 28 sağ) incelendi. Acetabulum'un ön kenarı morfolojik özelliklerine göre kavisli, düz, açılı ve düzensiz olarak sınıflandırıldı ve acetabulum'un transvers çapı (TÇ), acetabulum'un vertikal çapı (VÇ), acetabulum'un ön-arka çapı (ÖAÇ), incisura acetabuli genişliği (İAG), acetabulum derinliği (AD) ve os coxae yüksekliği (CY) ölçüldü.

Bulgular: Acetabulum ön kenarı coxa'ların 19'unda (% 33,3) düz, 18'inde (%31,6) kavisli, 14'ünde (%24,6) açılı, 6'sında (%10,5) düzensiz şekilli olarak bulundu. TÇ, VÇ, ÖAÇ, İAG, AD ve CY'nin ortalama değerleri sırasıyla 50,67±3,12 mm, 52,21±3,52 mm, 52,66±3,73 mm, 22,64±2,67 mm, 29,75±2,28 mm ve 206,33±11,70 mm idi. Sağ ve sol acetabulum ölçümleri arasında anlamlı fark bulunamazken($p>0,05$), acetabulum derinliği ile acetabulum ön kenar şekli arasında anlamlı fark bulundu ($p<0,05$).

Sonuç: Acetabulum'un normal anatomisinin bilinmesi bu bölgenin cerrahi işlemleri sırasında komplikasyonları önlemede önemlidir.

Anahtar Kelimeler: Acetabulum, anatomi, kalça protezi, morfometri, ön kenar

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INTRODUCTION

The acetabulum, the anterior and downward pit on the outer surface of the os coxae, transmits body weight to the femur via the lunate surface. The concave shape of the acetabulum shows harmony with the head of the femur, allowing whole movements around the hip joint.[1] Various movement disorders of the joint may occur in the pathologies of this region.[2] The normal anatomical morphology of the acetabulum is important in terms of some clinical pathologies' diagnosis or surgical success applied in this region and decreasing the risk of complications.[3], For example, pathologies of the hip joint, such as acetabular dysplasia or pincer-type femoral acetabular impingement, are associated with morphological abnormalities of the acetabulum, including diameter, depth and orientation.[4] Han et al. conducted a radiological study and presented the radiological parameters for acetabular dysplasia diagnosis.[5] And also, clinically, it is very important to know the morphology of the anterior acetabular ridge during total hip arthroplasty.[6] The shape of the acetabulum may be relevant in the design and implantation of hip implants.[7] Maruyama et al. evaluated the morphology of the anterior acetabular ridge to perform the hip joint implants correctly.[3] For these reasons, it is necessary to know the anatomy of the acetabulum to diagnose hip diseases and to make appropriate surgical treatments.

This study aims to reveal the morphological and morphometric features of the acetabulum, compare them with the current literature, and extend the data set.

MATERIALS AND METHODS

Ethical Status: Ethics committee approval was obtained from Hacettepe University Non-Interventional Clinical Research Ethics Committee (date: 10.052022, decision no: 2022/08-43). The study was conducted in accordance with the principles of the Declaration of Helsinki.

Cases: A total of 57 coxae (29 left, 28 right) from the Anatolian adult population of unknown gender and age were examined and included in the Hacettepe University Faculty of Medicine, Department of Anatomy collection. The specimens showed no obvious signs of physical damage or pathological trauma. The anterior ridge of the acetabulum was classified as curved, straight, angular and irregular according to its morphological features (Figure 1).[6,8-11]

In addition, six parameters of the acetabulum were measured. These are:

1. The transverse diameter of the acetabulum (TD): the maximum distance on the acetabular margin in horizontal plane,[10]
2. The vertical diameter of the acetabulum (VD): the maximum distance on the acetabular margin in vertical plane,[10]
3. The anteroposterior diameter of the acetabulum (APD): the maximum distance on the acetabular margin in anteroposterior axis,[10]
4. The acetabular depth (AD): Maximum vertical

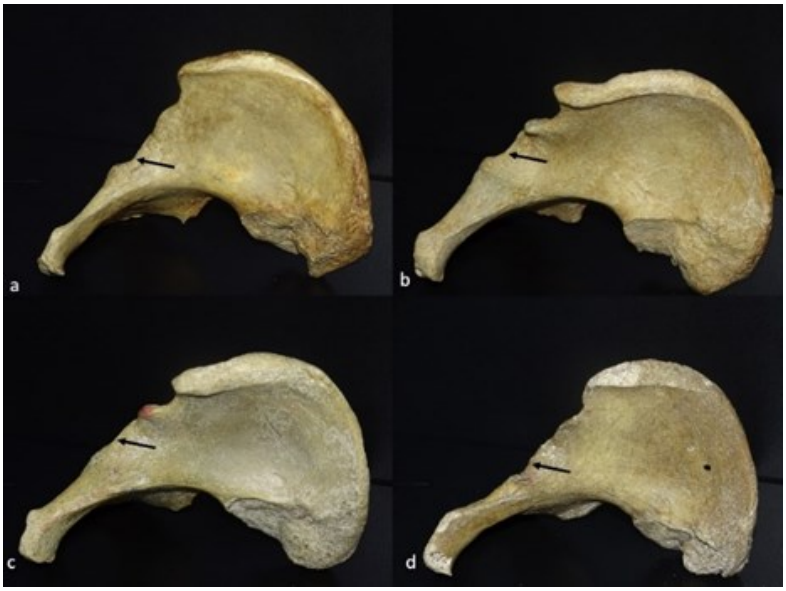

Figure 1. The view of the morphology of the anterior acetabular ridge. a) angular; b) curved; c) straight; d) irregular.

distance from the margin of the acetabulum to the deepest point in the acetabular cavity,[12]
5. Acetabular notch width (ANW): distance between the two ends of lunate articular surface,[10]
6. Os coxae height (CH): the maximum distance between the iliac crest and the ischiopubic ramus.[13]
Figure 2 shows these parameters.
A sliding digital calliper with a 0.01 millimetre (mm) accuracy was used for linear measurements. Length measurements were expressed as mean±standard deviation and in mm.

Statistical Analysis: SPSS (Statistical Package for the Social Sciences) 23.0 program was used for statistical analysis. The distribution of the data was evaluated with "Kolmogorov Smirnov and Shapiro-Wilk normality tests"; then, for normal distribution, Student's t-test was used for the difference between the two groups and one-way ANOVA test was used to determine whether there was a difference between more than two independent groups. The correlation of the data was evaluated with Pearson coefficient analysis. The significance level was set at $p<0.05$.

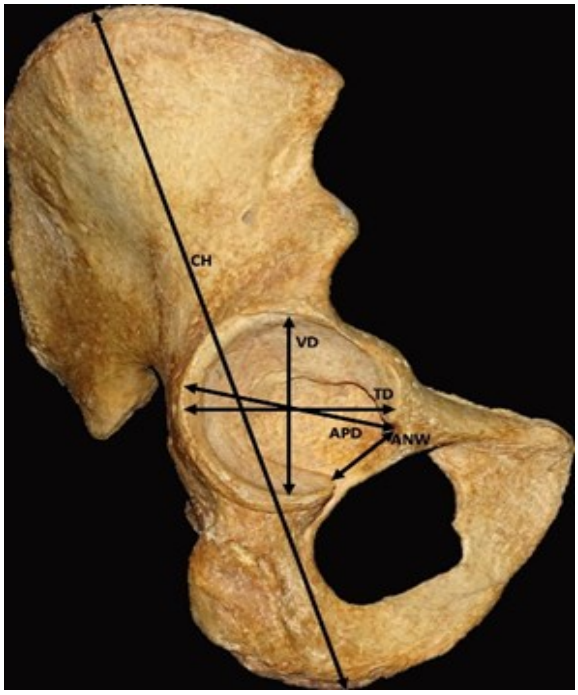

Figure 2. Demonstration of the measurement of the parameters.

TD: the transversal diameter of the acetabulum; VD: the vertical diameter of the acetabulum; APD: the anteroposterior diameter of the acetabulum; ANW: acetabular notch width; CH: os coxae height.

RESULTS

Based on our morphometric study of the shape of the 57 acetabula's anterior ridge, four distinct types could be identified. The straight-type acetabulum was observed on 19 samples (33.3%). 18 (31.6%), 14 (24.6%), and 6 (10.5%) were curved, angular and irregular subtypes, respectively (Figure 3).
The mean values of the TD, VD, APD, ANW, AD, and CH were 50.67±3.12 mm (R: 51.14±3.42 mm, L: 50.21±2.80 mm), 52.21±3.52 mm (R: 52.87±3.36 mm, L: 51.56±3.60 mm), 52.66±3.73 mm (R: 52.93±3.40 mm, L: 52.40±4.06 mm), 22.64±2.67 mm (R: 22.03±2.43 mm, L: 23.23±2.79 mm), 29.75±2.28 mm (R: 29.80±2.24 mm, L: 29.70±2.36 mm) and 206.33±11.70 mm (R: 208.29±12.39 mm, L: 204.45±10.85 mm) respectively. In the statistical analysis, no significant difference was found between the right and left coxae in terms of the measured parameters ($p>0.05$) (Table 1).

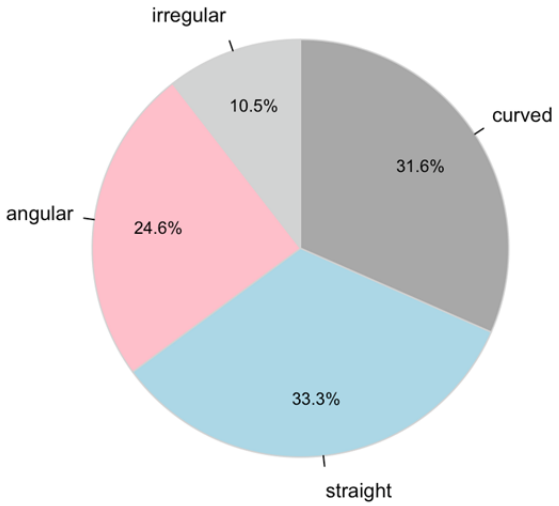

Figure 3. Distribution schema of the anterior acetabular ridge morphology.

Table 1. Shows the descriptive values of the right and left acetabulum.

Parameters	Side	n	Mean±SD	p-values
TD	L	29	50.21±2.80	0.27
	R	28	51.14±3.42	
	T	57	50.67±3.12	
VD	L	29	51.56±3.60	0.16
	R	28	52.87±3.36	
	T	57	52.21±3.52	
APD	L	29	52.40±4.06	0.59
	R	28	52.93±3.40	
	T	57	52.66±3.73	
ANW	L	29	23.23±2.79	0.09
	R	28	22.03±2.43	
	T	57	22.64±2.66	
AD	L	29	29.70±2.36	0.87
	R	28	29.80±2.24	
	T	57	29.75±2.28	
CH	L	29	204.45±10.85	0.22
	R	28	208.29±12.39	
	T	57	206.33±11.69	

TD: Transverse diameter; VD: Vertical diameter; APD: Anteroposterior diameter; AD: Acetabular depth; ANW: Acetabular notch width; CH: Os coxae height; R: Right, L: left; T: Total, n: Sample size; SD: Standard deviation.

There was only a difference between the shapes and the depth of the acetabulum ($p<0.05$). It was about the curved and angular types of the acetabula. The curved types were more in-depth than the angular ones (Figure 4).

In addition, a high positive correlation (R~0.80) was found between CH and TD, VD, APD and AD.

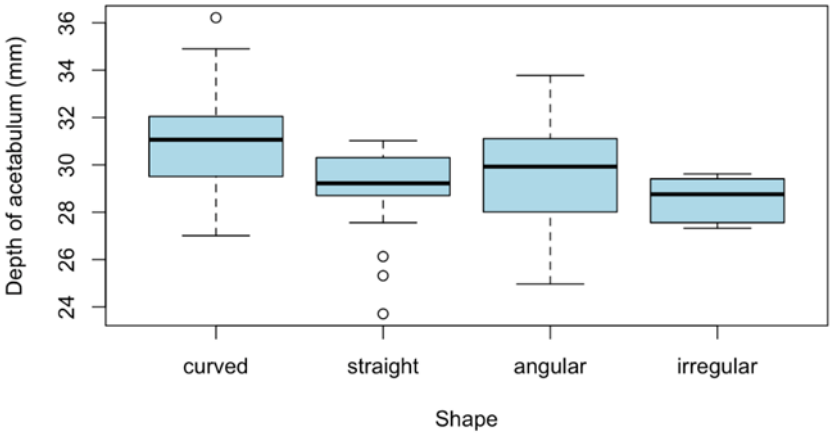

Figure 4. Schematic view of the correlation between the acetabular depth and anterior acetabular ridge morphology.

DISCUSSION AND CONCLUSION

Various movement disorders of the joint may occur in the pathologies of the acetabulum, such as osteoarthritis. Osteoarthritis is a common pathology that originates from many different reasons.[2] Acetabular dysplasia is one of the main causes of this clinical condition. Acetabular dysplasia correlates with the depth of the acetabulum. Acetabulum that is less than or equal to 9 mm in depth is defined as dysplastic.[6] In this case, a smaller surface area is revealed for weight bearing. Therefore, more force is applied per unit area, so more load is placed on the acetabulum. As a result, degeneration occurs in the hip joint.[14] The pathologies of the hip joint, such as acetabular dysplasia or pincer-type femoral acetabular impingement, are associated with morphological abnormalities of the acetabulum, including diameter, depth and orientation.[4] In treating patients who consult the physician with these clinical conditions, hip prostheses are used in progressive degenerations besides symptomatic treatments.[15] The morphology of the anterior acetabular ridge is clinically important for total hip arthroplasty.[3,6,7,11] The morphology of the anterior ridge of the acetabulum may differ depending on the populations living in different geographies, and this differentiation affects the anteversion of the acetabulum. These morphological differences observed in different people should be considered to reduce complications during surgical procedures such as acetabular prosthesis.[3] Positioning of the acetabular component is one of the most important steps in total hip arthroplasty; It must be done with care and requires mastery of acetabular morphology, as incorrectly positioned components can cause dislocations, impact and limited range of motion.[11]

The posterior acetabular ridge is almost always a simple semicircle. However, the anterior acetabular ridge is variable, and due to these variations, the amount of anteversion is affected by the measurement point along the anterior ridge.[3,6,11] The anterior acetabular ridge is classified as curved, straight, angular and irregular.[6-11] In studies in which the anterior ridge of the acetabulum was typed in populations living in different geographies, Devi and Philip (60%), Bahl et al. (44.1%), Gwala et al. (34.04%), Singh et al. (45.7%) and Govsa et al. (43.36%) in their study, the anterior ridge of the acetabulum was found the curved type most frequently,[6,8,9,11] while Indurjeeth et al. found angular type (41%).[7] In this study, the anterior ridge of the acetabulum was most commonly found in the straight type (33.3%). Devi and Philip (4%), Indurjeeth et al. (14%), Bahl et al. (5.9%), and Govsa et al. (11.94%) found the straight type as the least frequently in their study,[6-8,11] while this study (10.5%) and Gwala et al. (20.23%) and Sing et al. (13%), the irregular type was detected as the least frequently.[9,10]

When studies conducted in different geographical regions were searched, the minimum and maximum values of the morphometric measurements of the acetabulum were observed as 47.2 mm and 56.15 mm for TD, 48.00 mm and 54.84 mm for VD, 15.49 mm and 31.30 mm for AD, 18.08 mm and 23.98 mm for ANW. While the measurements made in our study were between these minimum and maximum values, the APD measurement in our study (right: 52.93±3.40 mm, left: 52.40±4.06 mm) compared to the study of Sing et al. in India (right: 48.70±4.54 mm, left: 48.86±3.68 mm) was found to be higher.[6-8,10,11,16,17]

As expected, no significant difference was found between the right and left coxae in terms of the measured parameters ($p>0.05$). To our knowledge, there is no clinically oriented difference between the sides and the other parameters.

Also, in our study, there was a difference between the shape and the depth of the acetabulum ($p<0.05$).

The curved types were greater in-depth than the angular types. We could not find any study or evaluation about whether this difference, which we did not observe in other studies, has clinical significance.

In conclusion, knowing the acetabulum's normal anatomical structure and morphometric values is important in preventing possible complications during surgical procedures applied to this region. We think that this study will be beneficial for surgeons and clinicians in surgical approaches to the coxae and will contribute to future studies. The study has some limitations. Since the age and gender of the bones used in the study were not known, age and gender differences of the coxae could not be revealed in this study. Also, the sample size was limited to 57 bones in this study.

Ethics Committee Approval: Ethics committee approval was obtained from Hacettepe University Non-Interventional Clinical Research Ethics Committee (date: 10.5.2022, decision no: 2022/08-43).

Conflict of Interest: No conflict of interest was declared by the authors.

Author Contributions: Concept - MÜ, HBI; Supervision - MÜ, HBI; Materials - MÜ, HBI; Data Collection and/or Processing - MÜ, HBI; Analysis and/or Interpretation - MÜ, HBI; Writing - MÜ, HBI.

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Magnetic Resonance Imaging Findings of Anatomy, Variation and Pathologies of Sternum, Sternoclavicular and Sternocostal Joints

Sternum, Sternoklavikular ve Sternokostal Eklemlerin Anatomi, Varyasyon ve Patolojilerinin Manyetik Rezonans Görüntüleme Bulguları

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ABSTRACT

Objective: The study aimed to assess the sternum's morphology and morphometry, and to find anomalies and diseases using breast magnetic resonance imaging (MRI).

Materials and Methods: Retrospective evaluations of 320 breast MRIs were conducted. Congenital abnormalities accompanying pathological conditions were investigated. The sternum overall's length, the manubrium-corpus' width and length, and the manubrium-corpus-xiphoid's shape were all measured. The relationship between the manubriosternal fusion and age was analyzed.

Results: Pectus excavatum, sternal band, sternal foramen, angled sternum and the sternal band, rachitic rosary, intraosseous ganglion, sternoclavicular joint degeneration, sternoclavicular joint ganglion cyst and costal cartilage calcifications, breast carcinoma metastasis, enchondroma and invasion of costal cartilages by malignant mesenchymal tumour were determined. The average length of the sternum was 144±14 mm, the manubrium length is 46±6 mm and the corpus length is 89±10 mm for adults. Manubrium was most commonly trapezoid in shape, the corpus was longitudinal oval and xiphoid was flat. 67% had no manubriosternal fusion. The degree of manubriosternal fusion did not show statistically significant correlation with increasing age.

Conclusion: The sternum, sternoclavicular, and sternocostal joints are susceptible to a wide range of congenital abnormalities and clinical conditions. Age increase has no relation to manubriosternal fusion.

Keywords: Magnetic resonance imaging, pathology, sternocostal joints, sternum

ÖZ

Amaç: Sternum, sternoklavikular ve sternokostal eklemlerin morfoloji ve morfometrisini değerlendirmek ve meme manyetik rezonans görüntülemede (MRG) anomali ve patolojileri saptamak amaçlandı.

Materyal ve Metot: 3 Tesla ana mayetik alan gücündeki bir sistemle elde edilen, 320 kadına ait meme MRG tetkikleri retrospektif olarak değerlendirildi. Konjenital anormallikler ve eşlik eden patolojik durumlar araştırıldı. Toplam sternumun uzunluğu, manubrium-korpus genişliği ve uzunluğu ve manubrium-korpus-ksifoid şekli değerlendirildi. Manubriosternal füzyon ile yaş arasındaki ilişki istatistiksel olarak analiz edildi.

Bulgular: Pektus ekskavatum, sternal bant, sternal foramen, açılı sternum (ve Poland sendromu), raşitik rozari, intraosseöz ganglion, sternoklavikular eklem dejenerasyonu, sternoklavikular eklem ganglion kisti ve kostal kıkırdak kalsifikasyonları, meme karsinomu metastazı, enkondrom ve malign mezenkimal tümör tarafından kostal kıkırdak invazyonu belirlendi. Morfometrik analiz, kadın erişkinlerde ortalama sternum uzunluğunun 144±14 mm, manubrium uzunluğunun 46±6 mm ve korpus uzunluğunun 89±10 mm olduğunu göstermiştir. Manubrium en yaygın olarak yamuk şeklinde, korpus uzunlamasına oval ve ksifoid düzdü. Olguların çoğunda (%67) manubriosternal füzyon yoktu. Manubriosternal füzyon derecesi, artan yaş ile istatistiksel olarak anlamlı bir korelasyon göstermedi.

Sonuç: Birçok doğumsal anomali ve patolojik süreç sternum, sternoklavikular ve sternokostal eklemleri etkileyebilir. Manubriosternal füzyon artan yaşla ilişkili değildir ve yaş tespiti için kullanılması uygun olmayabilir.

Anahtar Kelimeler: Manyetik rezonans görüntüleme, patoloji, sternokostal eklem, sternum

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INTRODUCTION

For practices in radiology, pediatrics, thoracic surgery, cardiovascular surgery, and forensic medicine, knowledge of the radiographic appearance of the anatomy, variation, and pathologies of the sternum, sternoclavicular, and sternocostal joints is crucial. It is known that these structures' variations, abnormalities, and diseases might cause various cardiopulmonary complications.[1-6] Additionally, it is essential to avoid potential and undesirable consequences before various interventional procedures.[7] In forensic circumstances, knowledge of the anatomy of the sternum may be useful in determining age and gender.[8-10]

Some anatomical features and numerical data of the sternum have great significance in anthropological researches. Sternal anomalies and morphometric analyses in living individuals have been evaluated especially by spiral computed tomography, multislice computed tomography, or magnetic resonance imaging (MRI).[11-15] These studies, however, are limited in number and no previous study has been performed by a 3 Tesla system.

When evaluating the sternum, sternoclavicular, and sternocostal joints, MRI is a crucial imaging technique. It has a high spatial and contrast resolution, is ionizing radiation-free, and supports multiplanar imaging. It can assess soft tissues, cartilage, and bone's cortex and medulla. Compared to computed tomography, bone marrow oedema and replacement are defined more precisely.[13] The likelihood of finding certain small lesions may increase in images taken with high main magnetic strength devices.

The aim of this study is to determine the anomalies and pathologies of the sternum, sternoclavicular and sternocostal joints, to perform the morphological and morphometric analysis of the sternum and evaluate the age-manubriostenal fusion relationship by evaluating breast MRIs.

MATERIALS AND METHODS

Ethical Status: Our study was approved by the Ethics Committee of the Institute of Health Sciences of Ataturk University (Date: 19.03.2013, decision no: 2.2/6). Informed consent was not obtained because of the retrospective observational design. The study design was evaluated for compliance with the guidelines for strengthening the reporting of epidemiological observational studies (STROBE).

Patients*:* We reviewed breast MRI data sets of patients who were evaluated at our institution between October 2010 and September 2014. A total of 320 females (mean age±standard deviation 39±12 years, range 3-67 years) were enrolled. The main indications for breast MRI were to detect multifocal, multicentric or contralateral breast carcinomas; to reveal invasive components in ductal carcinomas in situ; to identify occult cancer in patients with metastatic axillary nodes; to detect unequivocal findings on conventional imaging, to follow-up of neoadjuvant chemotherapy, to evaluate breast implants, and post-surgical findings.[16-20]

Breast MRIs: Breast MRIs were performed by a 3T system (Skyra; Siemens, Germany) with a dedicated breast coil in the prone position. The obtained sequences were sagittal fat-saturated turbo spin echo (TSE) T2-weighted imaging (WI), transverse short tau inversion recovery (STIR), transverse TSE T1-WI, transverse diffusion-WI using single-shot echo-planar imaging, transverse pre- and post-contrast fat-saturated fast low-angle shot (FLASH) 3D T1-WI. All the patients' gadolinium chelate was injected intravenously at 0.1 mmol/kg, followed by a 20 mL saline flush. The injection rate was 2 mL/s and a power injector was used. Dynamic imaging with FLASH 3D T1-WI was started after a fixed delay of 30 sec following contrast material injection.

Image Analysis: Images were retrieved from PACS (Picture archiving and communication system), and sternum, sternoclavicular and sternoclavicular joints were evaluated at the workstation (Syngo Via, Siemens, Enlarge, Germany). Variations and pathologies (such as pectus excavatum, pectus carinatum, angulated sternum, sternal band-cleft, sternal foramen, episternal ossicle, degenerative and inflammatory pathologies, infections, fractures, sternoclavicular dislocation, manubriosternal dislocation, et.c.) were noted, frequency of pathologies was investigated. Morphometric and morphologic analysis was performed in cases when the entire sternum or related part was displayed.

Morphometric analysis was performed from coronal STIR and coronal and sagittal reformations of FLASH 3D images. Total sternum length, length and width of manubrium and corpus, the shape of manubrium, corpus and xiphoid and manubriosternal fusion were all evaluated. Total sternum length was measured from the jugular notch to the end of the xiphoid. The manubrium's length was calculated from the jugular notch to the manubriosternal junction along the cortex's edge. The manubriosternal junction to the xiphoid was the point used to measure the corpus length.

Manubrium shape was visually assessed as quadrangle, trapezoid or triangle. Corpus length and width were evaluated on the longest coronal section. The shape of the corpus was visually evaluated as "O" shaped, longitudinal oval and flat.

The shape of the xiphoid was evaluated as flat, triangular, quadrangular and bifurcated.

Manubriosternal fusion was evaluated as "no fusion" and "fusion.

Statistical Analysis: Statistical analysis was performed using SPSS (Statistical Package for the Social Sciences) 24.0 software. The cases were divided into three groups according to their age (Group 1: 20 -35 years, Group 2: 36-50 years and Group 3: 51-70 years). In addition, the manubriosternal fusion of the patients was evaluated as "no fusion" and "fusion (complete or partial)". The Chi-square test was used to determine whether there was any difference between the age groups in terms of manubriosternal fusion. Spearman correlation test and Chi-square trend tests were used to determine whether manubriosternal fusion increased with increasing age. When the p-value was less than 0.05, it was considered statistically significant.

RESULTS

Among congenital anomalies, sternal band (n=1), sternal foramen (n=3) (Figure 1A), *pectus excavatum* (n=1) (Figure 1B), angled sternum and the sternal band (Figure 1D) with Poland syndrome (n=1) were detected. Among the degenerative and developmental pathologies, rachitic rosary due to rickets (n=1), sternal intraosseous ganglion adjacent to the sternoclavicular joint (n=1) (Figure 1C), sternoclavicular joint degeneration (n=3) (Figure 1E), and costal cartilage calcification (n=12) were detected (Figure 1). 11 cases of breast carcinoma metastasis, 7 cases of the benign bony lesion (Figure 1F) and 1 case of costal cartilage invasion by malign mesenchymal tumour (Figure 2) were detected.

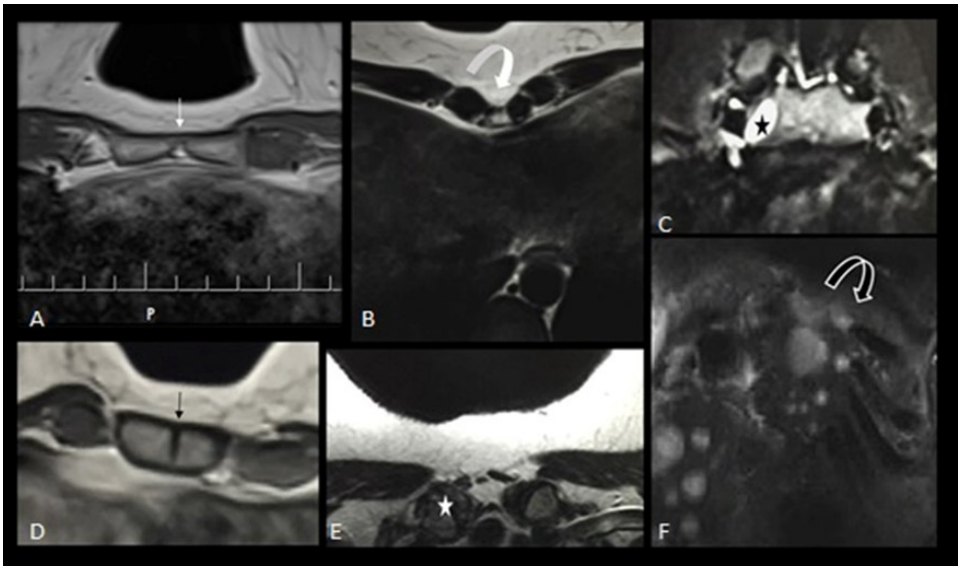

Figure 1. Sternal pathology and anomalies.
Sternal foramen (white arrow, A), pectus excavatum (solid curved arrow, B), manubrial intraosseous ganglion (black star, C), sternal band (black arrow, D), sternoclavicular joint degeneration (white star, E), sternal metastases (curved arrow, F).

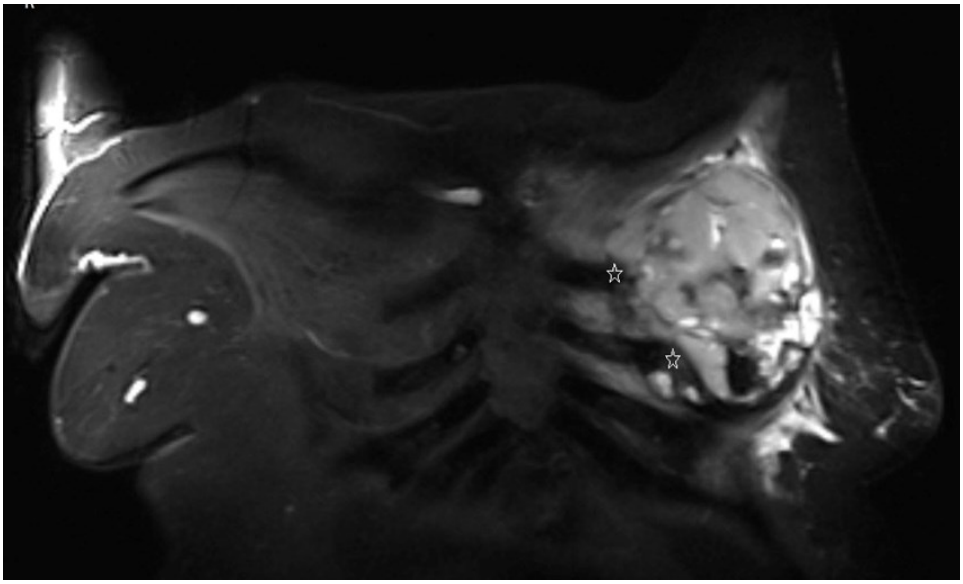

Figure 2. 67-year-old female patient. In the coronal STIR image, local invasion of the left costal cartilages (arrows) by malign mesenchymal tumor is observed.

In adult cases, morphometric and morphologic analysis was performed in cases when the entire sternum or related part was displayed. For this analysis, we included 113 cases older than 19 years old. 7 children were excluded. The mean sternal length was 144±14 millimetres (mm) ranging from 109 to 179 mm (Table 1).

The mean manubrium length (±stardard deviation) was 46±6 mm (27-70 mm). The mean manubrium width (±stardard deviation) was 54±6 mm (30-65 mm) (Table 1). Manubrium shape was evaluated as a trapezoid in 73 cases (65%), quadrangle in 28 cases (25%) and triangle in 12 cases (10%) (Table 2). The mean sternal body length (±stardard deviation) was 89±10 mm (56-113 mm). The mean sternal body width (±stardard deviation) was 36±6 mm (25-52 mm) (Table 1).

The sternal body shape was evaluated as longitudinal oval in 68 cases (60%), O-shaped in 25 cases (22%), and flat (18%) in 20 cases (Table 2). The xiphoid shape could be evaluated for 81 cases. Thirty-two (40%) of them were flat, 27 (33%) triangle, 18 (22%) quadrangle and 4 (5%) bifurcated (Table 2).

Manubriosternal fusion was seen in 37 (33%) cases and was not seen in 76 cases (67%). Manubriosternal fusion was complete in 15 cases (13%) and partial in 22 cases (20%). There was no statistically significant difference (p=0.43) by Chi-square test between groups (Group 1: 20-35 years, Group 2: 36-50 years and Group 3: 51-70 years) in terms of manubriosternal fusion (Table 3). In the Spearman correlation test, there was a pretty weak correlation between increased age and manubriosternal fusion (R = 0.06), and the correlation was not statistically significant (p=0.48). According to the Chi-square trend test, manubriosternal fusion did not progress with increasing age (p=0.38).

Table 1. Findings of morphometric analysis of sternum.

	n	Minimum- Maximum (mm)	Mean± Standard deviation (mm)
Total sternum length	113	109-179	144±14
Manubrium length	113	27-70	46±6
Manubrium width	113	30-65	54±0
Sternal body length	113	56-113	89±10
Sternal body width	113	25-52	36±6

mm: millimetre.

Table 2. Findings of morphological analysis of sternum.

		Case, n (%)
Manubrium shape	**Trapezoid**	73 (65)
	Quadrangle	28 (25)
	Triangle	12 (10)
Sternal body shape	**Longitudinal oval**	68 (60)
	"O" shaped	25 (22)
	Flat	20 (18)
Xiphoid shape	**Flat**	32 (40)
	Triangle	27 (33)
	Quadrangle	18 (22)
	Bifurcated	4 (5)

Table 3. Statistical analysis of age groups and manubriosternal fusion.

		Manubriosternal fusion (number, %)		Total	Statistical analysis
		No fusion	**Fusion (partial or complete)**		
Age groups	Group 1 (20-35 years)	15 (68)	7 (32)	22 (100)	p=0.43* R=0.06**
	Group 2 (36-50 years)	41 (72)	16 (28)	57 (100)	p=0.48*** P=0.38****
	Group 3 (51-70 years)	20 (59)	14 (41)	34 (100)	
Total		76 (67)	37 (33)	113 (100)	

*: Chi-square test between the age groups; **: Spearman correlation test between increased age and manubriosternal fusion; ***: Correlation test between increased age and manubriosternal fusion ; ****: Chi-square trend test, manubriosternal fusion between increased age.

DISCUSSION AND CONCLUSION

In this study, many different conditions affected this part of the thoracic wall. The most common manubrium-shape was a trapezoid, the corpus shape was longitudinal oval, and the xiphoid was flat. In the majority of cases, there was no manubriosternal fusion. There was no statistically significant correlation between increasing age and manubriostenal fusion.

In a study with multislice computerized tomography, one thousand consecutive patients were evaluated and sternal variations and anomalies were investigated. 4.1% suprasternal ossicles, 4% suprasternal tubercles, 19.6% complete manubriosternal fusion, 30.3% sternoxifoidal fusion, 4.5% sternal foramen and 37.1% sternal sclerotic band were detected.[11] The xiphoid process was 71% single piece. In another study, the morphologic features of the sternum and sex-related changes in adults were evaluated for 200 cases between 18-87 years of age and morphometric analysis was performed by multislice computerized tomography.[7] This study consisted of healthy men and women. For the determination of gender, the total length of the sternum was found to be more useful than corpus or manubrium lengths. 3.5% of the sternal foramen and 0.5% of sternal cleft changes were frequently seen in that investigation.[7] In our study, only females were evaluated with breast MRI, but the results were not analyzed regarding gender differences. In this group, congenital abnormalities were found 1.9% of the population. The fact that we only included females in our study could be one factor in the low prevalence. Breast MRI is not a main technique for breast, and it is only used on a limited number of patients. As a result, our study population did not accurately reflect the overall population.

In order to assess the degree of fusion between the sternum bones and identify its significance for determining age and gender, Pekcan et al. examined multislice computed tomography data from 620 patients (310 females and 310 men).[21] According to their research, the manubrium and corpus fully fuse at 31 years of age for men and 26 years of age for women. They stressed that the degree of fusion increases with age but that modelling of age prediction is impossible due to the large diversity in the degree of fusion.[21] The study of Garg et al. aimed to determine the radiological age by examining the manubriosternal joint between the people living in Punjab.[22] They evaluated lateral radiographs of the sternum, and it was concluded that the earliest age for manubriosternal fusion was 35 for males and 37 for females. The latest age was 65 for both sexes. According to their study, 60% of 60-65 year-old patients of cases did not show complete manubriosternal fusion.[22] Therefore, the authors did not find appropriate the manubriosternal fusion-based age determination during forensic medicine applications.[22] In our study, the degree of manubriosternal fusion did not show a statistically significant difference among age groups, and there was no significant correlation between the increasing age and fusion as well. The basic distinction between these last two studies is their different imaging methods. High-contrast resolution of MRI provides a better understanding of the boundaries of cartilaginous areas than radiography and computed tomography. It is possible to evaluate the fusion with a more realistic result by MRI.

Aslam et al., in their study on evaluating sternum and sternoclavicular joints by MRI emphasized that these anatomic structures can be examined ideally by MRI.[13] They especially mentioned that the sagittal plan is important in evaluating the sternum and retrosternal region. They also pointed out that MRI is an appropriate method for associated abnormalities of the other intrathoracic structures. It is also important and useful in assessing some features accompanying malignant lesions, such as bone destruction, bone marrow infiltration, periosteal reaction, and soft tissue components.[13]

Aslam et al. have also noted that primary and secondary tumors and infections may be better assessed by MRI.[13] They emphasized the advantage of evaluating pathologic specimens of the sternoclavicular joints, especially in the coronal plane.[13] In our study, transverse, coronal and sagittal images obtained with a 3T scanner were evaluated. It was also possible to evaluate subcentimetric lesions due to high magnetic field strength and high spatial resolution. The sternal band, sternal foramen, rachitic rosary, enchondromas, ganglion cysts and the joint degeneration findings were tiny lesions, and they were easily detected by MRI in our study.

Morphometric differences in various organs and systems among individuals have been defined and are relatively standardized. However, there is limited information about morphometry and morphology of the sternum. These findings are of great importance in terms of anthropological investigations.[6] Selthofer and colleagues performed morphometric analyses of 55 male and 35 female cadaveric sternums from their osteological collections.[6] They evaluated the sternal segments in terms of width, length and thickness, and found that the overall sternum structure was similar in both males and females, but they found that the female sternum was relatively short, narrow and thin.[6] According to their results, the mean manubrium length was 52 mm and width 45 mm, sternal body length 94 mm and width 27 mm and total sternum length 182 mm in females.[6] According to the study of Atesoglu et al., the manubrium length was found to be 46.7±5.1 mm, the sternal body length 86.6±9.7 mm and the total sternum

length 133.1±1.1 mm.[7] In our study, as mentioned earlier, in adult women, the total length of the sternum was 144±14 mm, the length of the manubrium was 46±6 mm, and the length of the sternal body was 89±10 mm.

One of the strengths of this study, which assesses the anatomy, variation and pathology of the sternum, sternoclavicular and sternocostal joints, and perhaps most importantly, is the use of an ideal imaging modality. Another strength of this study is the fact that the quality of examinations could provide enough spatial and contrast resolution to discover minor lesions. The study could be applied to a relatively large group of patients, and a wide spectrum of variations, anomalies and pathologies were identified.

Because breast MRI is primarily a female imaging technique and the male population has not been studied, this is one of the study's limitations (population bias). A limitation of the study is that it does not reflect the general population, as was already highlighted. Others included a retrospective design, no control group, and fewer patients.

In conclusion, congenital anomalies, developmental and degenerative processes, and a wide variety of abnormalities and pathologies, such as neoplasms can affect the sternum, sternoclavicular and sternocostal joints. An accurate diagnosis means that the patients are directed correctly to the appropriate interventions and treatments. MRI has the impression of being one of the most suitable methods for assessing the morphology and pathological processes in a wide variety of anatomical regions that can be observed in such a narrow but complex anatomical region with the ability to evaluate the anatomic compartments in more detail than other imaging modalities and to enable characterization of tissues.

Ethics Committee Approval: Our study was approved by the Ethics Committee of the Institute of Health Sciences of Ataturk University (Date 19.03.2013, decision no:2.2/6). Informed consent was not obtained because of the retrospective observational design. The study design was evaluated for compliance with the guidelines of strengthening the reporting of observational studies in epidemiology (STROBE).

Conflict of Interest: No conflict of interest was declared by the authors.

Author Contributions: Concept–IDS, MS, SD; Supervision–IDS, MS, SD; Materials–IDS; Data collection and/or Processing–IDS; Analysis and/or interpretation–IDS, MS, SD; Writing–IDS, MS, SD.

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Domestic Violence Against Women: A Cross-Sectional Study

Kadına Yönelik Aile İçi Şiddet: Kesitsel Bir Çalışma

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ABSTRACT

Objective: Domestic violence against women is an important public health problem worldwide and in Türkiye. This study aimed to analyze participants' demographic characteristics, violence levels, and relations between the two.

Materials and Methods: 308 women participated in the study online via “Google Forms”. Participants answered "Sociodemographic Characteristics and Data Form" and “The Severity of Violence Against Women Scale”. As a method inside SPSS, descriptive statistical analysis and nonparametric tests were used in analysis of the data.

Results: It has been determined that demographic characteristics of participants are better than average for Türkiye. Proportion of women who have been subjected to violence in at least one sub-category by not answering "never" to all questions is 43.8%. 41.6% of participating women did not answer "never" to all questions about the threat dimension, 14% about the actual violence dimension, and 7.5% about the sexual violence dimension. In comparative analyzes, a significant difference or a significant correlation couldn’t be detected for most part.

Conclusion: Frequency of not answering "never" to all questions in the violence dimensions except the "threat dimension" was low. Level of violence was found low in all sizes. It is recommended that the study be repeated under better conditions.

Keywords: Domestic violence, domestic violence against women, public health

ÖZ

Amaç: Dünyada ve Türkiye’de kadına yönelik aile içi şiddet önemli bir halk sağlığı sorunudur. Bu çalışmada çalışmaya katılan katılımcıların demografik özelliklerini, şiddet görme düzeylerini ve ikisi arasındaki ilişkileri analiz etmek amaçlanmıştır.

Materyal ve Metot: Araştırmaya 308 kadın “Google Forms” üzerinden çevrimiçi bir şekilde katılmıştır. Katılımcılar “Sosyodemografik Özellikler ve Veri Formunu” ve “Kadına Yönelik Şiddet Derecelendirme Ölçeğini” cevaplamışlardır. Yöntem olarak verilerin analizinde SPSS içerisinde tanımlayıcı istatiksel analiz ve nonparametrik testler kullanılmıştır.

Bulgular: Katılımcıların Türkiye ortalamasına göre demografik özelliklerinin daha olumlu olduğu tespit edilmiştir. Bütün sorulara “asla” cevabını vermeyerek en az 1 alt kategoride şiddet gören kadınların oranı %43,8’dir. Katılımcı kadınların %41,6’sı tehdit boyutunu ele alan, %14’ü eylem boyutunu ele alan ve %7,5’i cinsel şiddet boyutunu ele alan bütün sorulara “asla” cevabını vermemiştir. Karşılaştırmalı analizlerde ise büyük çoğunlukla anlamlı bir farklılık ya da anlamlı bir ilişki tespit edilememiştir.

Sonuç: “Tehdit boyutu” dışındaki şiddet boyutlarında bütün sorulara “asla” cevabını vermeme sıklığı düşük olarak bulunmuştur. Şiddet görme düzeyi ise bütün boyutlarda düşük bulunmuştur. Çalışmanın daha uygun şartlar içerisinde tekrarlanması önerilmektedir.

Anahtar Kelimeler: Aile içi şiddet, halk sağlığı, kadına yönelik aile içi şiddet

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INTRODUCTION

Domestic violence against women is a major public health problem in Türkiye and the world. In the research conducted by the Ministry of Family and Social Services General Directorate of Women's Status (KSGM) and carried out by Hacettepe University Institute of Population Studies in 2013-2014, the proportion of women who have been subjected to physical violence at least once by their spouses was found to be 36%. The ratio of women who have experienced sexual violence at least once and have been married is 12%. Those exposed to physical and/or sexual violence at least once were determined as 38%. This shows that domestic violence against women is an ongoing and crucial public health problem in Türkiye.[1]

In the World Health Organization report in 2013, it was determined that 35% of women worldwide had been subjected to either physical and/or sexual violence by their partner or sexual violence by a person who is not their partner.[2-6]

There are economic, legal, political, mediatic, religious, psychiatric, biological, and sociological situations that pave the way for violence. Behaviors involving domestic violence are transmitted as a behavior pattern from generation to generation through observation and imitation.[7]

This study aimed to analyze the participants' demographic characteristics, violence levels, and the relations between them.

MATERIALS AND METHODS

Ethics Committee Approval: This project was submitted to and approved by the University of Health Sciences Hamidiye Scientific Research Ethics Committee (Date: 01.10.2021, decision no: 30/7). This study was carried out by the international declaration, guidelines, etc.

Patient Selection: There is an online participation in this cross-sectional research from all over Türkiye, mainly from Istanbul and other metropolitan cities. "Research on Domestic Violence Against Women in Türkiye" conducted by KSGM in 2013-2014 is the most up-to-date and comprehensive research. This study was used as a reference for the expected prevalence value. According to the data of this study, the proportion of women subjected to physical violence at least once by their spouses was 36% throughout Türkiye. The ratio of women who have experienced sexual violence at least once and have been married is 12%. Those who have been exposed to physical and/or sexual violence at least once is 38% (KSGM 2014). The sample size was found to be 451 using the sample size calculation for cross-sectional studies with the OpenEpi program, with an expected prevalence value of 12% (frequency of sexual violence) and a 95% confidence level with a 3% margin of error. Although the sample size was 451, 308 women could participate in this study. Women who have completed 18 and have spent the last year (wholly or partially) living with their family or partner participated.

Study Protocol: Women participated in this study online. In this study, the "The Severity of Violence Against Women Scale" consisting of 46 questions was used. The "The Severity of Violence Against Women Scale", which is used to evaluate the participants in terms of physical violence (threat of violence dimension and actual violence dimension) and exposure to sexual violence, was prepared by 'Marshall' in 1992 under the name of "Severity of Violence Against Women".[8] This scale was adapted to Turkish by Tuz et al.[9] The scale consists of 46 items with short sentences, cases with physical violence (threat of violence dimension and actual violence dimension) and sexual violence, and has a 4-point Likert-type scale as 1: Never, 2: Once, 3: A few times and 4: Many times. The scale is based on individuals' feedback. The degree of severity increases as the scale and subscales score increases. It is used to evaluate the physical and sexual aspects of violence scientifically. The internal reliability coefficient of the scale, Cronbach's alpha, was found to be 0.979 with high reliability and 0.738 with excellent reliability, respectively. The Severity of Violence Against Women Scale with nine sub-domains explains 88.1% of the variance. There are subscales to distinguish the severity of the violence. The nine sub-domains of the scale are: threat (symbolic), threat (mild), threat (moderate), and threat (severe) of violence; actual (mild), actual (minor), actual (moderate), actual (severe) violence, and sexual violence. The threat dimension ranges from symbolic to mild, medium and severe; in the actual violence dimension, the effectiveness of violence increases, respectively, from mild to minor, moderate and severe. The first 4 questions are related to a symbolic threat, questions 5-8 are about a mild threat, questions 9-12 are about a moderate threat, and questions 13-19 are about a severe threat. Questions 20-23 are related to actual mild, questions 24-28 are about actual minor, questions 29-31 are about actual moderate and questions 32-40 are about actual severe violence. Questions 41-46 are about sexual violence. In the first 19 questions, the threat dimension of physical violence and psychological violence (due to the emotional stress created by the threat) are discussed. The questions 20-40 address the actual violence dimension. Sexual violence is discussed in the questions 41-46. All groups are completely independent of each other. For this reason, for an example, someone who gets a low score on the "mild act"

questions may get a higher score on the "severe act" questions. In addition to this scale, a questionnaire related to demographic information named "Sociodemographic Characteristics and Data Form" was used to obtain demographic information. The demographic characteristics of the participants and their partners and their habits towards harmful substances were questioned. It consists of 46 questions.

Data Collection: The data obtained in the research were filled by the participating women online through the "Google Forms" application from 20 January 2022 to 3 February 2022. Participants answered the "Sociodemographic Characteristics and Data Form" and the "The Severity of Violence Against Women Scale", respectively. Those living with their partner answered the questions on the scale for their partners, while those living with their families answered the questions on the scale for their families.

Statistical Analysis: The research data were evaluated with the SPSS (Statistical Package for the Social Sciences) for Windows 22.0 statistical analysis program (SPSS 2013). Count, percentage, mean, standard deviation, minimum and maximum values were used as descriptive statistics. According to the results obtained, the exposure of women participating in the study to domestic violence was analyzed by descriptive statistics. Descriptive statistical analysis was made for both "Sociodemographic Characteristics and Data Form" and "The Severity of Violence Against Women Scale". While the Mann-Whitney U Test was used for the comparative analysis of nominal independent variables consisting of two groups with the dependent variable containing the means of the scale responses, the Kruskal-Wallis Test was used for the comparative analysis of the nominal and ordinal independent variables consisting of three or more groups with the dependent variable including the means of the scale responses. While performing the Post Hoc Test (as there is no normal distribution), analyzes were made over the Tamhane option. Spearman correlation analysis was performed to compare the independent numerical variables with the dependent variable, including the scale responses' means. The cut-off value for statistical significance in all test results was taken as $p<0.05$.

RESULTS

Regarding marital status, 31.8% of women are single, 62% are married, 5.5% are widowed or divorced, and 0.6% live together. 1.4% of women with a partner have lived together under 18 for the first time (except unanswered). It has been found that 77.9% of women have undergraduate or higher education in terms of educational status and 68% of women's (except unanswered) partners have undergraduate or higher education. 59.1% of women (except unanswered) stated that their families have a sufficient income. Regarding family structure, 7.9% of women (except unanswered) have an extended family, while 92.1% have a nuclear family (Table 1).

Table 1. Demographic characteristics of the participants.

Demographic Characteristics		n (%)
Marital Status	Single	98 (31.8)
	Married	191 (62.0)
	Widowed or Divorced	17 (5.6)
	Living together	2 (0.6)
	Total	308 (100.0)
First Living Together Age	Before the 18	3 (1.4)
	After the 18	209 (98.6)
	Total	212 (100.0)
Education	High school and below	48 (15.6)
	Associate degree	20 (6.5)
	Undergraduate	215 (69.8)
	Graduate	25 (8.1)
	Total	308 (100.0)
Family Income Status	Hunger threshold or below	38 (13.8)
	Poverty threshold or below	75 (27.1)
	Quite enough	163 (59.1)
	Total	276 (100.0)
Family Structure	Extended family	19 (7.9)
	Nuclear family	222 (92.1)
	Total	241 (100.0)
Partner's Education	High school and below	58 (25.1)
	Associate degree	16 (6.9)
	Undergraduate	130 (56.3)
	Graduate	27 (11.7)
	Total	231 (100.0)

It was found that 65.6% of the women never smoked and 13% of them used more than half a pack. It was determined that 60.2% of the women's (except unanswered) partners never smoked and 19.9% of them used more than half a pack a day. It was found that 63.3% of the women never used alcohol. It was determined that 56.7% of the women's (except unanswered) partners never used alcohol and 2.6% of them consumed more than 2 drinks a day (Table 2).

The mean score of the participants for the questions that measure all subscale types one by one were calculated along with their related median scores (Table 3).

Table 2. The use of harmful substances by the participants.

Harmful Substances		n (%)
Tobacco use	Non-user	202 (65.6)
	Less than 5 a day	37 (12.0)
	Less than 10 a day	29 (9.4)
	More than 10 a day	40 (13.0)
	Total	308 (100.0)
Alcohol use	Non-user	195 (63.3)
	Less than 1 drink a day	111 (36.1)
	Less than 2 drinks a day	2 (0.6)
	Total	308 (100.0)
Partner's Tobacco use	Non-user	139 (60.2)
	Less than 5 a day	32 (13.8)
	Less than 10 a day	14 (6.1)
	More than 10 a day	46 (19.9)
	Total	231 (100.0)
Partner's Alcohol use	Non-user	131 (56.7)
	Less than 1 drink a day	86 (37.2)
	Less than 2 drinks a day	8 (3.5)
	More than 2 drinks a day	6 (2.6)
	Total	231 (100.0)

Table 3. Evaluation of the scores of the participants from The Severity of Violence Against Women Scale.

Sub-domains of the scale	Mean±SD	Median(Min-Max)
Symbolic Threat	1.2078±0.46568	2.25 (1.00-4.00)
Mild Threat	1.2995±0.57728	2.375 (1.00-3.75)
Moderate Threat	1.1023±0.35311	2.125 (1.00-4.00)
Severe Threat	1.0533±0.21137	1.57 (1.00-3.57)
Actual Mild Violence	1.0698±0.23875	1.75 (1.00-2.75)
Actual Minor Violence	1.0442±0.18227	1.60 (1.00-3.00)
Actual Moderate Violence	1.0444±0.20626	1.835 (1.00-2.67)
Actual Severe Violence	1.0188±0.14310	1.275 (1.00-3.33)
Sexual Violence	1.0319±0.13170	1.33 (1.00-2.00)

In the research, by not answering all questions as "never", the frequency of women exposed to violence in at least one sub-form, even if at a minimum level, was 43.8%. On the other hand, 56.2% of women answered "never" to all questions on the scale. This situation was determined through the analysis of the variable covering the mean scores per question of all scale questions (1-46). 58.4% of the participants marked the "never" option for the questions (1-19) addressing all of the threat sub-domain. In contrast, 41.6% of them did not mark that option. The mean score of 4.5% of the participants from the questions about the threat sub-domain is above 2, while 95.5% of the participants'scores are below 2. This situation was determined through the analysis of the variable covering the mean scores per question of the threat questions (1-19). 86% of the participants marked "never" for the questions (20-40) addressing all of the actual violence sub. In contrast, 14% of them did not mark that option. The mean score of 1% of the participants from the questions about this sub-domain is above 2, while 99% of the participants' scores are below 2. This situation was determined through the analysis of the variable covering the mean scores per question of the actual violence questions (20-40). 92.5% of the participants marked the "never" option for the questions (41-46) addressing all of the sexual violence sub. In contrast,

7.5% of them did not mark that option. The mean score of 1% of the participants from the questions related to the sub-domain of sexual violence is above 2, while 99% of the participants' scores are below 2. This situation was determined through the analysis of the variable covering the mean scores per question of the sexual violence questions (41-46).

According to the Post Hoc Test analysis results, there was no significant difference in marital status between the groups ($p>0.05$ for all). But there are significant differences in the "living together" group, which is the 4th group, compared to the "single" and "married" groups, but there are only two individuals in this group ($p<0.05$). According to the Post Hoc Test analysis results about alcohol, there was a statistically significant difference in the "less than two drinks per day" group, which included only two people, compared to the other groups ($p<0.05$ for all). However, there was no significant difference between the other groups ($p>0.05$ for all). Apart from these minor exceptions, no significant difference or a significant correlation could be detected in all other demographic characteristics, such as family income and education level among their subgroups or with the scale score ($p>0.05$ for all).

DISCUSSION AND CONCLUSION

1.4% of women with a partner have lived together under 18 for the first time, which is lower than the 2021 Turkish Statistical Institute (TUIK) data on marriage for the first time under 18 (24.2%).[10] 84.4% of women have at least an associate degree or more. This is higher than the proportion of the female population over the age of 25 who are higher education graduates, which is 17.3%, according to 2021 TUIK data. 74.9% of women's partners have at least an associate degree or more. This is higher than the proportion of the male population over the age of 25 who are higher education graduates, which is 21.1% according to 2021 TUIK data.[11] Regarding family structure, 7.9% of women have an extended family, while 92.1% have a nuclear family. In terms of a nuclear family, this is higher than the proportions of 64.4% nuclear family and 13.5% extended family, according to 2021 TUIK data.[12]

14% of women subjected to actual physical violence at least once (even if at a minimum level) and 7.5% of women subjected to sexual violence at least once (even if at a minimum level) in this study. Unlike this study, there are higher available physical and sexual violence ratios in other literature studies. In the literature, it is reported that 35-39% of women have been exposed to physical violence at least once by their partner, and 12-15% of them have been exposed to sexual violence at least once by their partner.[1,13-14] According to "Domestic violence against women in Türkiye" study in 2018, 41.3% of the women were exposed to general domestic violence. Of the women subjected to general domestic violence, 44.8% were subjected to physical violence, and 13.4% to sexual violence.[15] The general domestic violence ratio (41.3%) shows similarity with this research. Because the frequency of women exposed to violence in at least one sub-form, even if at a minimum level, was 43.8% in this study. According to World Health Organization (WHO) in 2019, 35% of worldwide women were subjected to physical and/or sexual violence by an intimate partner or sexual violence by any people in their whole life. In addition, according to WHO in 2018, 26% of worldwide ever-married/partnered women aged 15 years and older have been exposed to physical and/or sexual violence from the current or divorced husband or intimate male partner at least once in their whole life (after the age of 15). However, in the last 12 months only 10% of them have been exposed to physical and/or sexual intimate partner violence. That situation shows more similitary with this study. Because both of them only contain the last 12 months only and 10% is close to this study's 14% and 7.5% ratios.[16-17]

The people participating in the study mostly have positive characteristics compared to the average for Türkiye in terms of sociodemographic factors such as income level, education level and bad habits. It is thought that this situation causes the level of exposure to violence to be lower in the results of the study compared to other studies.

In the comparative analyzes in this study, no significant difference or correlation was found in terms of violence scores (apart from very minor exceptions). Since the women who participated in the study have a positive profile compared to the average for Türkiye in terms of demographic characteristics, there is a numerical disproportion between the subgroups of the grouped independent variables. Subgroups with positive traits have more people, while subgroups with negative traits have fewer people. However, the people participating in the research either have never been subjected to violence in any way or have experienced mild acts of violence because they have positive demographic characteristics. Since the number of people who have suffered severe acts of violence is limited, it is thought that obtaining meaningful data in comparative analysis is difficult.

It can be considered as an indication that when the demographic characteristics are positive, the level of violence can be low. The frequency of women not choosing "never" for all answers is high for "threat dimension" but low for "actual violence dimension" and "sexual violence dimension". When we look at the frequency of not selecting the "never" option in all answers, women are most exposed to the threat dimension. The actual violence dimension and the sexual violence dimension, respectively, follow this.

As a primary prevention against violence, people are informed about issues such as domestic violence, anger management and resolving disputes using non -violent methods, and mechanisms to which victims of violence can resort. Secondary preventions are programs for people who show the first symptoms and have the potential to commit acts of violence. Tertiary preventions are programs in which sanctions and penalties are applied to perpetrators and the support to be received by victims of violence is determined.[18]

It is necessary for the state to make legal and practical arrangements on violence and gender equality, to create programs and campaigns that raise people's awareness about violence, to develop a national policy in cooperation with various sectors, and to provide socio-economic support and health services support for women and children who are exposed or have the potential to be subjected to violence.[19]

The state's positive discrimination for women in necessary matters, establishment of a helpline for victims of violence, social services support, communication support, health services support, shelter support, legal consultancy support, law enforcement support, rehabilitation service, and financial support are also seen as important.[20]

In conclusion, because the participants mostly have positive demographic characteristics presence of a numerical disproportion between the subgroups of the grouped independent variables, the research is mainly attended by the close circle of the researcher, and the investigation is online and cross-sectional, it is recommended that this research be re-conducted by eliminating the limitations. If the research is done again, it is recommended to represent all demographic subgroups in sufficient numbers, to provide participants from all over Türkiye in a more randomized manner, and to ensure that the demographic characteristics of the participants are closer to the TUIK data. As for the importance of the study, in the descriptive statistical analyses, demographic characteristics drew a positive profile compared to the average for Türkiye, while the level of experiencing forms of violence in the 9 subscales was lower than the average for Türkiye. Despite the sample size is calculated as 451 only 308 women were able to join the study (that may weaken the study's power). Mostly, the women in the researcher's family, friends and relatives were able to participate in the study. It is thought that the cross-sectional type of the study and the fact that mostly women in the researcher's family, friends and relatives participated in the study create a limitation in evaluating the cause-effect relationship and generalizing the results. Since the research was conducted online because of the pandemic, there is also the possibility of giving incomplete or incorrect answers as a choice or error among the participating women.

Ethics Committee Approval: The study was approved by the University of Health Sciences Hamidiye Scientific Research Ethics Committee (Date: 01.10.2021, decision no. 30/7). The study was carried out by the international declaration, guidelines, etc.

Conflict of Interest: No conflict of interest was declared by the authors.

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Examination of Female Healthcare Professionals' Work-Family Life Balance and Burnout Within the COVID-19 Period

COVID-19 Pandemi Sürecinde Kadın Sağlık Çalışanların İş Aile Yaşam Dengesi ve Tükenmişliğinin İncelenmesi

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ABSTRACT

Objective: The study aimed at female healthcare professionals' work-family life balance and burnout levels during the COVID-19 pandemic.

Materials and Methods: The study has a cross-sectional descriptive design. The questionnaire forms were sent to female healthcare professionals online. A total of 305 female healthcare professionals who answered the questionnaire were included. Data were collected using the "Descriptive Information Form", "Work-Family Life Balance Scale (WFLBS)", and "Maslach Burnout Inventory (MBI)."

Results: In the study, female healthcare professionals' mean WFLBS score was 3.140.66; "Negative Impacts of Work on Family" subscale mean score was 2.30±1.10; "Negative Impacts of Family on Work" subscale mean score was 3.751.19 and "Work-Family Accordance" subscale mean score was 3.910.78. Mean MBI score was found as 46.1913.51, while mean scores were found as 19.80±8.57 for "Emotional Exhaustion", 6.72± 4.90 for "Depersonalization", and 19.66±5.39 for "Personal Accomplishment" subscales. A negative correlation was found between the overall mean scores of the WFLBS and the MBI.

Conclusion: It was found that work-family life balance of female healthcare professionals was moderate, and the lowest score was found in the negative effect of the job on the family. It found that as work-family life balance of female healthcare professionals deteriorated, their burnout levels increased.

Keywords: Burnout, COVID-19, female healthcare professionals, work-family life balance

ÖZ

Amaç: Araştırma, COVID-19 pandemi sürecinde kadın sağlık çalışanların iş aile yaşam dengesi ve tükenmişliklerinin incelenmesi amacıyla yapıldı.

Materyal ve Metot: Araştırma kesitsel tanımlayıcıdır. Anket formu online olarak kadın sağlık çalışanlarına gönderildi. Anketlere geri dönüş sağlayan 305 kadın sağlık çalışanı araştırmaya dahil edildi. Veriler, tanıtıcı bilgi formu, İş Aile Yaşam Dengesi Ölçeği (İAYDÖ), Maslach Tükenmişlik Anketi (MBI) kullanılarak toplandı.

Bulgular: Araştırmada kadın sağlık çalışanların İAYDÖ toplam puan ortalaması 3,14±.0,66; "İşin Aileye Olumsuz Etkisi" alt boyut puan ortalaması 2,30±1,10; "Ailenin İşe Olumsuz Etkisi " alt boyut puan ortalaması 3,751,19 ve "İş- Aile Uyumu "alt boyut puan ortalaması 3.910.78 olarak bulundu. MTÖ toplam puan ortalaması 46,19±13,51; "Duygusal tükenme" alt boyut puan ortalaması 19,80±8.57; "Duyarsızlaşma" alt boyut puan ortalaması 6,72± 4,90; "Kişisel başarı" alt boyut puan ortalaması 19,66±5,39 olarak saptandı. İAYDÖ ile MTÖ toplam puan ortalamaları arasında negatif yönde bir ilişki olduğu saptandı.

Sonuç: Kadın sağlık çalışanlarının iş-aile yaşam dengelerinin orta düzeyde olduğu, işin aileye olumsuz etkisinin ise en düşük puanı aldığı saptandı. Kadın sağlık çalışanların tükenmişliklerinin yüksek düzeyde olduğu saptandı. Kadın sağlık çalışanlarının iş-aile-yaşam dengeleri bozuldukça tükenmişliklerinin arttığı saptandı

Anahtar Kelimeler: COVID 19, iş aile yaşam dengesi, kadın sağlık çalışanları, tükenmişlik

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INTRODUCTION

Coronavirus disease (COVID-19) is a respiratory tract disease caused by a newly discovered coronavirus. COVID-19 was first reported in Wuhan, Hubei Province of China, in November 2019 and spread to almost all countries in a few months; in March 2020, the World Health Organization made the assessment that COVID-19 can be characterised as a pandemic.[1]

Within the scope of the measures taken in line with the course of the epidemic, with the changing working conditions of workplaces, the closure of schools and the need to meet some basic needs such as distance education of children, control of homework, cooking and cleaning in the household, it has become more difficult for women to bear with their business life.[2] Individuals working in the health sector during the COVID-19 pandemic period are faced with many sources of stress, such as the prolongation of working hours, the ever-increasing number of patients, the constant vigilance due to the risk of disease transmission, the physical limitation of working with protective equipment, the loss of spontaneity and autonomy, the current situation regarding COVID-19 and the need to keep track of information and family responsibilities.[3] Attaining satisfactory role balance is another key challenge working women face. Achieving a satisfactory role balance is challenging for women as they have to perform a disproportionate number of domestic roles.[4]

The COVID-19 pandemic has posed an unprecedented threat and significant challenges for healthcare professionals.[5] In terms of female healthcare professionals, it has caused problems related to working life to deepen even more.[6] During the COVID-19 pandemic, female healthcare professionals have become the greatest force in combating the epidemic.[5] Already experiencing gender-based problems in their business lives in the pre-pandemic process, female healthcare professionals have faced more problems due to the epidemic's physical and psychological effects.[6] Along with the increasing workload during the pandemic, healthcare providers have been pressured to prioritise their work and make personal sacrifices for their work. These pressure and job demands have negatively impacted healthcare providers' ability to leave their duties after they quit and caused work-family conflict.[7] Because of this work-life imbalance, many physicians, nurses, and other healthcare providers have faced a risk of burnout.[8] In studies conducted to examine the determinants of work-family conflict, it is reported that situations arising from the nature of health services lead to work-family conflict[2] and that female healthcare workers experience a higher level of work-family conflict compared to men.[9]

This descriptive study aimed to examine the work-family-life balance problems faced by healthcare professionals, who have become the greatest power in fighting against the pandemic, and their burnout levels within the framework of the female gender.

MATERIALS AND METHODS

Ethics Approval: The ethics committee approval was obtained from the Ethics Committee of a university (Date: 22/09/2020, decision no: 413808). All procedures have been carried out by the Helsinki Declaration.

Study Design: This is a cross-sectional and descriptive study.

Population and Sample: The study was conducted between 17 and 22 October 2020. In the study, "snowball sampling", one of the nonprobability sampling techniques, was used. Data were collected online. A total of 560 female healthcare professionals were reached through this online questionnaire form. 255 of the female health workers reached were not included in the study because they did not meet the research criteria (agreeing to participate in the study, working in a university, government or private hospital). Therefore, 305 (54.5%) female healthcare professionals who responded to the questionnaire forms were included in the study. Power analysis of the study was performed in G*Power 3.1 program. According to the power analysis, an effect size of 0.336 with a power of 90% at the 0.05 level of margin of error was obtained. The power analysis has indicated that the data collected were adequate.[10]

Data Collection Tools

Personal Information Form: This form questions the descriptive characteristics of female health workers.

Work-Family Life Balance Scale (WFLBS): This scale was developed by Apaydın (2011) to determine faculty members' work-family life balance perceptions.[11] The scale is an 11-item 5-point Likert type. The Work-Family Life Balance Scale consists of nine negative and two positive items. A score between 1 and 5 is taken from the scale. It was stated that the higher the score is, the higher the work-family life balance is. Negative items were reversely scored. The scale has three subscales: "Negative Impacts of Work on Family", "Negative Impacts of Family on Work", and "Work-Family Accordance". The Cronbach's alpha of the scale was.84.[11] In this study, we found Cronbach's alpha as .74.

Maslach Burnout Inventory (MBI): In this study, the MBI was used to evaluate the burnout levels of respondents. The MBI was developed by Maslach and Jackson in 1981, and it was adapted into Turkish by Ergin in 1992.[12,13] All 22 items of MBI are scored

using a 5-level frequency rating from "Never=0" to "Always=4". The MBI has three subscales: emotional exhaustion (EE), depersonalisation (DP), and personal accomplishment (PA). Emotional Exhaustion and Depersonalization consist of negative components, while Personal Accomplishment consists of positive components. It is expected for individuals experiencing burnout to have a high score of Emotional Exhaustion and Depersonalization and a low score of Personal Accomplishment. The Cronbach's alpha coefficients were found as 0.81; 0.70; and 0.77 for emotional exhaustion, depersonalisation, and personal accomplishment, respectively.[13] In this study, Cronbach's alpha values were found as 0.91; 0.80; and 0.74 for emotional exhaustion, depersonalisation, and personal accomplishment, respectively.

Statical Analysis: The statistical analysis was performed with SPSS Version 20.0 statistic software. Descriptive statistics for the variables were given as numbers, percentages, arithmetic mean and standard deviation. In the study, which showed normal distribution, the Independent Samples t-test was used to compare two independent groups. A one-way analysis of variance (ANOVA) was used to compare more than two group means. A value of $p<0.05$ was considered statistically significant.

RESULTS

The distribution of female health workers according to their descriptive characteristics is shown in Table 1.

The subscale mean scores of female health workers in the study are shown in Table 2.

The comparison of the descriptive characteristics of female health workers with the mean scores of WFLBS and MBI and their statistical significance

Table 1. Distribution of female healthcare professionals by their descriptive characteristics (n=305).

Mean age (Mean±SD)		30.66 ±7.14
		n(%)
Marital status	Married	178(58.4)
	Single	127(41.46)
Level of education	High school	15(4.9)
	Two-year degree	32(10.5)
	Undergraduate	210(68.9)
	Post-graduate	48(15.7)
	Doctor	13(4.3)
Profession	Nurse	163(53.4)
	Midwife	76(24.9)
	Other*	53(17.4)
Years in the profession	0-3	105(34.4)
	4-7	59(19.3)
	8-11	65(21.3)
	12 and more	76(24.9)
The state of working hours being affected during the Covid-19 pandemic process	Increased	167(54.8)
	Decreased	38(12.5)
	No change	100(32.8)
The state of family life being affected during the Covid-19 pandemic process	Little	9(3)
	Moderate	75 (24.6)
	Very much	213(69.8)
	No change	8(2.6)
The state of having chronic disease	Yes	56(18.4)
	No	249(81.6)
The state of having individuals older than 65 in the house	Yes	53(17.4)
	No	252(82.6)
The state of having individuals with chronic disease in the house	Yes	142(46.9)
	No	162(53.1)
The state of having been infected with COVID-19	Yes	24(7.9)
	No	281(92.1)
The state of having cared for individuals with COVID-19	Yes	180(59)
	No	125(41)
The state of having family members infected with COVID-19	Yes	51(16.7)
	No	54(83.3)
The state of staying isolated in one's home or at a different place (teacher's lodge, doctor's lodge) since the beginning of the COVID-19 process	Yes	125(41)
	No	180(59)
The hours of sleep one gets a day	0-3 hours	80(15.7)
	4-7 hours	202(66.2)
	7 hours and more	55(18)
The state of defining the diet during the pandemic process	Good	80(26.2)
	Moderate	167(54.8)
	Bad	58(19)

*: Pharmacist, Paramedic, Emergency medical technician, Radiology technician.

Table 2. Distributions of mean WFLBS and MBI Scores of female healthcare professionals (n=305).

SCALES		Number of items	Min. Score	Max. Score	X±SD
WFLBS Sub-dimensions	Negative effects of work on family	5	1	5	2.30±1.10
	Negative effects of family on work	3	1	5	3.75±1.19
	Work-family harmony	3	3	5	3.91±0.78
	WFLBS Total	11	1.64	5	3.14±0.66
MBI Sub-dimensions	Emotional Exhaustion	9	0	36	19.80±8.57
	Depersonalisation	5	0	20	6.72±4.90
	Personal accomplishment	8	0	31	19.66±5.39
	MBI Total	22	2	82	46.19±13.51

WFLBS: Work-Family Life Balance Scale; MBI: Maslach Burnout Inventor.

Table 3. Comparison of female healthcare professionals' mean WFLBS and MBI scores by their descriptive characteristics (n=305).

		WFLBS Total and Sub-dimensions (Mean±SD)				MBI Total and Sub-dimensions (Mean±SD)			
		Negative effects of work on family	**Negative effects of family on work**	**Work-family harmony**	**Total WFLBS**	**Emotional Exhaustion**	**Depersonalisation**	**Personal accomplishment**	**Total MBI**
Marital Status	Married	2.38±1.12	3.76±1.17	3.86±0.77	3.16±0.68	19.46±8.38	6.54±4.71	19.58±5.21	45.58±12.93
	Single	2.19±1.06	3.74±1.22	3.97±0.80	3.10±.64	20.27±8.85	6.98±5.17	19.77±5.65	47.03±14.29
Test and Significance		t=1.492 p=137	t=0.159 p=0.874	t=-1.203 p=0.230	t=.807 p=0.420	t=-0.817 p=414	t=-0.770 p=0.442	t=-299 p=0.765	t=-0.918 p=0.359
Level of Education	High school	2.89±1.16	3.91±1.15	3.66±0.78	3.38±.59	17.00±19.18	5.20±5.08	18.33±5.80	40.53±15.97
	Two-year degree	2.04±1.01	3.72±1.03	3.83±.78	2.99±.61	20.34±6.56	6.31±4.45	20.25±4.47	46.90±10.91
	Undergraduate	2.32±1.10	3.74±1.20	3.91±.78	3.14±.67	17.79±8.79	6.83±4.89	19.62±5.48	46.26±13.45
	Post-graduate	2.22±1.09	3.73±1.26	4.03±.80	3.12±.67	20.33±8.66	7.00±5.24	19.33±5.50	47.16±14.49
Test and Significance		F=2.165 p=0.092	F=0.095 p=0..963	F=0.980 p=0.402	F=1.199 p=0.310	F=0.635 p=0.593	F=0.643 p=0.588	F=0.447 p=0.720	F=0.992 p=0.397
Profession	Doctor	2.72±1.14	4.15±0.71	3.74±.81	3.39±.56	17.76±7.24	7.38±3.96	17.53±4.68	42.69±10.78
	Nurse	2.17±1.04	3.62±1.25	3.94±.77	3.05±.68	19.86±8.72	7.39±5.16	19.70±5.44	46.96±14.03
	Midwife	2.60±1.18	3.79±1.21	3.83±.72	3.26±.69	19.21±7.96	5.01±4.21	19.90±4.43	44.13±12.39
	Other*	2.20±1.07	3.96±0.99	3.96±.90	3.16±.56	20.94±9.30	6.98±4.76	19.69±5.37	47.62±13.86
Test and Significance		**F=3.496 p=0.016**	F=1.695 p=0.168	F=0.656 p=0.579	F=2.465 p=0.062	F=0.677 p=0.567	F=4.355 p=0.005	F=0.727 p=0.537	F=1.258 p=289

WFLBS: Work-Family Life Balance Scale; MBI: Maslach Burnout Inventor.

Table 3. Continue.

Years in the profession	0-3 years	2.43±1.20	3.82±1.19	3.88±.82	3.21±.70	19.78±8.64	6.41±4.94	19.50±5.55	45.70±13.42
	4-7 years	2.49±1.18	3.78±1.25	3.83±.78	3.20±.75	18.77±8.83	6.76±4.55	20.08±4.70	45.62±13.03
	8-11 years	1.98±.94	3.51±1.19	3.94±.76	2.93±.60	22.01±8.21	7.78±5.20	20.23±5.41	50.03±13.49
	12 years and more	2.27±0.946	3.82±1.13	3.99±0.76	3.16±0.56	18.72±8.38	6.22±4.80	19.06±5.66	44.01±13.61
Test and Significance		F=2.988 p=0.031	F=1.090 p=0..354	F=.527 p=0.664	**F=2.705 p=0.046**	F=2.146 p=0.095	F=1.418 p=0.238	F=.699 p=0.553	F=2.524 p=0.58
The state of working hours being affected during the Covid-19 pandemic process	Increased	2.19±1.03	3.73±1.21	4.02±0.76	3.11±0.61	20.22±8.55	7.17±4.95	20.31±5.49	47.71±13.60
	Decreased	2.40±1.14	3.64±1.23	3.76±.81	3.11±.73	18.44±7.87	5.97±4.34	18.18±5.77	42.60±11.86
	No change	2.46±1.19	3.82±1.14	3.78±.78	3.19±.72	19.61±8.89	6.26±4.99	19.13±4.94	45.00±13.69
Test and Significance		F=1.949 p=0.144	F=.0317 p=729	**F=4.025 p=0.019**	F=0.424 p=0.655	F=0.697 p=0.499	F=1.618 p=0.200	**F=3.191 p=0.043**	F=2.827 p=0.061
The state of family life being affected during the Covid-19 pandemic process	Little	2.57±1.25	4.18±1.13	3.74±.92	3.33±0.83	18.11±11.10	7.11±5.39	17.88±5.41	43.11±17.06
	Moderate	2.70±1.09	4.16±0.91	3.92±.92	3.43±0.61	17.02±8.60	5.50±5.34	20.00±6.43	42.53±14.15
	Very much	2.10±1.02	3.56±1.24	3.92±.76	3.00±0.62	21.06±8.07	7.18±4.66	19.57±4.96	47.82±12.66
	No change	3.60±1.31	4.54±0.46	3.62±.67	3.86±0.66	14.12±11.21	5.50±5.29	20.75±6.27	40.37±18.72
Test and Significance		**F=10.388 p=0.000**	**F=6.758 p=0.000**	F=0.532 p=0.661	**F=12.823 p=0.000**	**F=5.680 p=0.001**	F=2.390 p=0.069	F=0.564 p=651	**F=3.612 p=0.014**
The state of having chronic disease	Yes	2.36±1.16	4.16±0.86	3.88±0.73	3.26±0.66	20.07±8.05	5.27±4.86	19.98±5.14	45.32±13.23
	No	2.29±1.09	3.66±1.23	3.92±0.80	3.11±0.66	19.74±8.70	7.04±4.86	19.59±5.45	46.38±13.59
Test and Significance		t=.411, p=0.681	**t=3.555 p=0.001**	t=-.310 p=.757	t=1.585 p=0.114	t=.260, p=0.795	**t=-.2.449 p=0.015**	t=.485 p=0.628	t=-.522 p=0.602
The state of having individuals older than 65 in the house	Yes	1.92±0.84	3.31±1.29	3.83±0.85	2.82±.56	22.13±7.40	6.66±5.41	20.77±4.94	49.56±13.17
	No	2.38±1.13	3.84±1.15	3.93±0.77	3.20±0.67	19.30±8.73	6.74±4.80	19.42±5.46	45.48±13.50
Test and Significance		**t=-3.396 p=0.001**	**t=-2.984 p=0.003**	t=-0.859 p=391	**t=-3.886 p=0.000**	**t=2.191 p=0.029**	t=-0.110 p=0.913	t=.1.655 p=0.099	**t=-2.011 p=0.045**
The state of having individuals with chronic disease in the house	Yes	2.31±1.14	3.63±1.24	3.88±0.80	3.10±.70	19.86±8.46	6.32±4.74	19.95±5.39	46.15±13.48
	No	2.30.±1.07	3.85±1.13	3.93±0.77	3.17±.63	19.74±8.70	7.08±5.03	19.40±5.39	46.22±13.58
Test and Significance		t=0.034 p=973	t=-1.610 p=0.109	t=-0.554 p=0.580	t=-0.933 p=0.351	t=0.128 p=0.898	t=-1.337 p=0.182	t=0.899 p=0.369	t=-0.044 p=0.965
The state of having been infected with COVID-19	Yes	2.21±1.05	4.01±0.95	4.05±0.72	3.20±.59	20.41±10.12	7.33±5.59	19.04±4.41	46.79±17.32
	No	2.31±1.10	3.73±1.20	3.90±0.79	3.13±.67	19.74±8.45	6.67±4.85	19.71±5.47	46.13±13.17

Table 3. Continue.

Test and Significance		t=-0.423 p=0.673	t=1.117 p=0.265	t=0.911 p=363	t=0.518 p=0.605	t=0.366 p=0.714	t=0.629 p=530	t=-0.587 p=0.558	t=0.180 p=0.858
The state of having cared for individuals with COVID-19	Yes	2.04±0.89	3.71±1.18	3.95±0.78	3.02±.57	21.42±8.19	7.55±4.80	19.72±4.78	48.70±12.77
	No	2.68±1.25	3.80±1.20	3.85±0.79	3.30±.76	17.45±8.60	5.53±4.81	19.57±6.18	42.56±13.77
Test and Significance		**t=-0.4.832 p=0.000**	t=0.727 p=0.545	t=1.135 p=0.257	**t=-0.3.518 p=0.001**	**t=4.077 p=0.000**	**t=3.604 p=0.000**	t=0.222 p=0.824	**t=0.557 p=0.000**
The state of having family members infected with COVID-19	Yes	2.38±1.10	3.72±1.11	4.01±0.78	3.19±0.67	19.56±8.22	6.64±4.31	18.82±5.06	45.03±13.29
	No	2.29±1.10	3.75±1.20	3.89±0.78	3.12±0.66	19.84±8.66	6.74±5.02	19.83±5.45	46.42±13.57
Test and Significance		t=0.567 p=0.571	t= -0.180 p= 857	t=0.976 p=330	t=0.651 p=0.515	t=-0.211 p=0.833	t=-.129 p=0.898	t=-1.218 p=224	t=-0.666 p=506
The state of staying isolated in one's home or at a different place (teacher's lodge, doctor's lodge) since the beginning of the COVID-19 process	Yes	2.22±1.10	3.80±1.20	3.86±.84	3.10±.64	20.04±8.70	6.70±5.09	19.36±5.90	46.11±13.70
	No	2.36±1.09	3.71±1.18	3.95±0.74	3.16±.68	19.63±8.51	6.74±4.78	19.86±5.01	46.24±13.41
Test and Significance		t= -1.154 p=249	t= 638 p=524	t= -937 p=350	t= -855 p=393	t=0.407 p=0.685	t= -0.071 p=0.944	t=-0.771 p=0.442	t=-0.084 p=0.933
The hours of sleep one gets a day	0-3	2.53±1.03	3.84±1.03	3.86±0.77	3.25±.62	18.14±7.76	5.91±4.38	18.72±5.18	42.79±11.89
	4-7	2.22±1.06	3.67±1.21	3.92±0.78	3.08±.65	20.79±8.42	7.12±4.98	19.59±5.26	47.51±13.05
	7 hours and more	2.42±1.24	3.96±1.22	3.90±0.83	3.25±.74	17.58±9.29	5.96±4.93	20.72±5.93	44.27±15.82
Test and Significance		F=1.963 p=0.142	F=1.464 p=0.226	F=0.111 p=0.895	F=2.37 p=0.109	**F=4.180 p=0.016**	F=2.010 p=0.136	F=1.816 p=0.164	**F=3.091 p=0.047**
The state of defining the diet during the pandemic process	Good	2.31±1.05	3.64±1.14	3.95±0.80	3.12±.64	19.62±8.00	6.32±4.50	19.27±5.55	45.22±14.36
	Moderate	2.29±1.14	3.79±1.19	3.92±0.76	3.14±.68	19.91±8.69	6.94±5.07	19.70±5.29	46.55±12.71
	Bad	2.34±1.07	3.78±1.25	3.83±0.83	3.14±.65	19.72±9.14	6.67±4.99	20.06±5.50	46.46±14.67
Test and Significance		F=0.047 p=0.954	F=0.439 p=0.645	F=0.405 p=0.667	F=0.039 p=0.962	F=0.032 p=0.968	F=0.428 p=0.652	F=0.375 p=0.687	F=0.276 p=0.0759

Table 4. Comparison of age, WFLBS and MBI and Sub-dimensions**.**

		Age	Negative effects of work on family	Negative effects of family on work	Work-family harmony	Total WFLBS	Emotional Exhaustion	Depersonalisation	Personal accomplishment	Total MBI
Age	**r**	1	0.030	0.070	0.003	0.057	0.033	-0.019	0.016	0.020
	p	.	0.603	0.224	0.954	0.317	0.562	0.739	0.786	0.722
Negative effects of work on family	**r**	0.030	1	0.430**	-0.347**	0.848**	-0.593**	-0.302**	-0.136*	-0.541**
	p	0.603	.	**0.0001**	**0.0001**	0.**0001**	**0.0001**	**0.0001**	0.**017**	**0.0001**
Negative effects of family on work	**r**	0.070	0.430**	1	-0.156**	0.759**	-0.355**	-0.391**	-0.014	-0.373
	p	0.224	0.**0001**	.	**0.006**	**0.0001**	0.**0001**	**0.0001**	0.807	**0.0001**
Work-family harmony	**r**	0.003	-0.347**	-0.156**	1	-0.014	0.162**	0.022	0.367**	0.258**
	p	0.954	**0.000**	**0.006**	.	0.806	0.**004**	0.698	**0.000**	**0.000**
Total WFLBS	**r**	0.057	0.848**	0.759**	-0.014	1	-0.566**	-0.410**	0.009	-0.504
	p	0.317	**0.0001**	**0001**	0.806	.	**0.0001**	**0.0001**	0.872	**.0001**

Pearson Correlation; *:p<0.05; **p<0.01.

levels are shown in Table 3. Table 4 shows the correlation between age, and the scales used, and the subscales.

DISCUSSION AND CONCLUSION

The findings obtained as a result of the research were discussed in the light of the literature.

In this study, it was determined that the work-family life balance of female healthcare professionals was at a moderate level. When examined in terms of subdimensions, it was determined that the negative effect on the family received the lowest score. Work and family life balance is when an individual accords the needs of business and family life with each other and redresses the balance.[14] Female healthcare professionals who are at the centre of the fight against the COVID-19 pandemic have experienced negative circumstances such as balancing work and family life, failure to fulfil their responsibilities of caring for the sick, elderly, and children in their family in the face of the risk of infection, often being on duty at risk, and intensive and stressful work. Within that period, female healthcare professionals and their family members have been exposed to more psychological traumas, which has led to the deepening of the problems of female workers in the health sector.[6] Literature information supports our study findings in this respect.

This study determined that the work-family accordance of female healthcare professionals was at a good level. In the world and Türkiye, women experience extraordinary situations at their home, at work and in the community, due to the COVID-19 pandemic.[15] This situation may be associated with female healthcare professionals, who have both work and domestic responsibilities and have made more intense efforts not to disrupt their roles in the family and to ensure work-family accord. It is seen that women had to undertake the main part of the burden of care after the pandemic as before the pandemic. For example, when pre-pandemic data are examined, it is understood that those responsible for care work on a global scale are women to a large extent, as Oxfam indicates in its report on women and care work.[16] Similarly, as the Turkish Statistical Institute[17] has revealed in its report "Time Use Survey", "working women spend five times more time on family care than men in Türkiye. For household and family care, women allocate 3 hours and 31 minutes daily, and working men 46 minutes a day, on average."[17] According to the OECD's report,[18] Turkish women spend 5 hours and 8 minutes daily on unpaid work while their menfolk spend only 1 hour and 30 minutes daily. This information in the literature supports our study results.

It was found that female healthcare professionals who participated in the study experienced high levels of burnout. When many studies conducted in the pre-pandemic period were examined, it was reported that nurses had the highest burnout rates.[19] In a study

examining the mediating effect of social support between employees' work-life balance and burnout in the coronavirus pandemic measures and social isolation, Tuğsal[20] determined that the burnout levels of female healthcare professionals were higher. The result of the study was similar to the studies carried out. Healthcare professionals in the health sector have endured great sacrifices to solve the major health problems caused by the COVID-19 pandemic; moreover, they have served heroically for long periods at the risk of being detached from their families, loved ones, and even their own lives. Within that period, they often had to experience concerns such as staying alone with patients requiring intensive health care for a long time, the risk of becoming infected, and anxiety about infecting these viruses to their families and loved ones.[21,22] All these negative situations experienced might have caused healthcare professionals to experience more burnout.

In this study, a significant correlation was found between the number of years in the profession and the WFLBS mean scores, and those with 0-3 working years had higher mean scores of the WFLBS. This circumstance can be explained by the failure to complete the adaptation process to the profession, and the disturbance of the work-family life balance due to the different negativities arising from the COVID-19 pandemic. Work and family life conflicts during the COVID-19 period increase the stress on individuals, and being able to balance both becomes one of the main problems for women in this difficult process.[15,21,23] Çobanoğlu et al.[24] made a study on teachers and managers to evaluate work-life balance, and they found that as the number of years spent by participants in the profession increases, they become more successful in achieving a balance between work and life. Polat[23] stated that as female teachers' years of working in the profession decrease, the work-life imbalance increases and more conflicts are experienced. Based on this, it can be understood that the more experience an individual has, the higher his competence is to fulfil the demands and requirements of his job and to adapt between the two components. The studies conducted are in parallel with the study findings.

In terms of participants included in the study, a significant correlation was found between the mean overall WFLBS and MBI scores and the exposure to family life during the COVID-19 period, having an individual aged 65 years and older in the resident they lived, and the state of giving care for a COVID-19 patient. In many parts of the world, it was observed that COVID-19 often progresses severely among patients with advanced age and comorbidity.[25] In their study carried out with 425 patients, Li et al.[26] did not identify any young patient case under 15 years of age. More than half of the patients were male, and the majority were 45 years or older. In later studies, it was observed that the disease progressed more severely in advanced ages and male patients.[24] It can be said that women are more affected by this period due to the anxiety about protecting their families. In this process, the mounting burden, responsibility and stress of living in the same house with an individual over 65 in the riskier group have negatively affected the work-family balance of individuals and led healthcare employees to get more tired and even exhausted.[22] During the pandemic process, factors such as increasing demands of children for domestic education, having elderly parents who need care and safety, developmental delays, having family members with chronic emotional or behavioural difficulties or other health problems can drive the family into a crisis and cause conflicts within the family by disturbing the work-life balance.[15] This finding also supports the research result.

In this study, a significant negative correlation was found between the WFLBS mean scores and the MBI mean scores of female healthcare professionals. It was observed that as individuals' work-family life balance deteriorates, their burnout level increases. In his study conducted with individuals from different sectors during COVID-19, Tuğsal[20] determined that work-life balance is an important factor affecting burnout. Wang et al.[27] stated that female physicians experienced more burnout than male physicians during the pandemic, and the family's support was effective in their burnout. Güran and Güler[28] reported that work-family conflict increases burnout. These studies in the literature support the findings of the study.

In conclusion, it was found that the work-family life balance of female healthcare professionals was moderate. It was determined that the sub-dimension of the negative effect of work on the family had the lowest score. We determined that the burnout of female healthcare professionals was at high levels. We found that as work-family life balances of female healthcare professionals deteriorate, their levels of burnout increase as well. In line with these results, making arrangements for the working hours of female healthcare professionals can be recommended. Moreover, to reduce the workload of female healthcare professionals and maintain work-family balance, opening special family and psychological counselling units in institutions can be recommended in cooperation with the Ministry of Family and Social Policies and the Ministry of Health. As a limitation, this study has three limitations in this study; First, this may have caused sampling bias because only the individuals who could be reached online participated in the study, and the snowball sampling method was used. The second limitation is;

The reliability of the data is limited by the accuracy of the answers given by all individuals participating in the research. Third limitation; the study's results apply to the individuals included in the survey; Therefore, it cannot be generalised to the whole society.

Ethics Committee Approval: This research was approved by the non-interventional ethics committee of Fırat University. (Date: 22/09/2020, decision no: 413808). All procedures have been carried out by the Helsinki Declaration.

Conflict of Interest: No conflict of interest was declared by the authors.

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Examination of Pain Assessment and Multimodal Analgesia Records in Trauma Patients

Travma Hastalarında Multimodal Analjezi ve Ağrı Değerlendirme Kayıtlarının İncelenmesi

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ABSTRACT

Objective: This study aimed to reduce the side effects of multiple pain sources and investigate the effectiveness of multiple analgesics in trauma pain.

Materials and Methods: The research was conducted with nurse observation forms of 190 trauma patients hospitalised in the emergency unit of a university hospital between March 1 and September 30, 2019. In the statistical analysis, per cent mean, min-max values and standard deviation were used for descriptive data. Paired Simple t-test was used for repeated measurements of the double-dependent variable.

Results: The mean age of the patients included in the study was 40.94±15.18 years, and 65.8% were male. While the cause of 47.9% of traumas is traffic accidents, 37.9% of the patients have multiple traumas. The pain was evaluated in 55.7% of the patients, and multimodal analgesia was applied in 71.6% of the patients, and it was determined that the pain of the patients decreased.

Conclusion: Accordingly, this study supports the treatment of trauma pain with multiple sources of pain with a multimodal analgesia approach. In addition, the pain was not appropriately assessed as recommended in the acute pain guidelines. Therefore, nurses should increase awareness of pain assessment records for effective pain management.

Keywords: Emergency department, multimodal analgesia, nursing, pain

ÖZ

Amaç: Bu çalışmada, travma hastalarında ağrı değerlendirmesi ve multimodal analjezi kayıtlarının incelenmesi amaçlanmıştır.

Materyal ve Metot: Araştırma 1 Mart-30 Eylül 2019 tarihleri arasında, bir üniversite hastanesinin acil ünitesinde yatan, 190 travmalı hastanın hemşire gözlem formlarıyla yapıldı. Araştırmanın verileri Hasta Bilgi Formu ve Multimodal Analjezi Değerlendirme Formu ile toplanmıştır. Verilerin istatistiksel analizinde tanımlayıcı verilerde yüzde ortalama, minimum-maksimum değerleri ve standart sapma kullanıldı. İkili bağımlı değişkene ait tekrarlı ölçümler için Paired Simle t- testi kullanıldı.

Bulgular: Araştırmaya dâhil edilen hastaların yaş ortalaması 40,94±15,18 olup, %65,8'i erkektir. Travmaların % 47,9'unun nedeni trafik kazaları iken, hastaların % 37,9'unda multiple travma mevcuttur. Hastaların % 55,7'sine ağrı değerlendirmesi yapılmış olup, %71,6'sına multimodal analjezi uygulandığı ve hastaların ağrısının azaldığı saptandı. Ayrıca, gözlem formlarında farmakolojik olmayan ağrı tedavisine ilişkin hemşire kaydına rastlanmadı.

Sonuç: Buna göre, bu çalışma travma ağrısının çoklu ağrı kaynakları ile multimodal analjezi yaklaşımı ile tedavisini desteklemektedir. Ek olarak, ağrı, akut ağrı kılavuzlarında önerildiği gibi uygun şekilde değerlendirilmemiştir. Bu nedenle hemşireler, etkili ağrı yönetimi için ağrı değerlendirme kayıtlarının farkındalığını arttırmalıdır.

Anahtar Kelimeler: Acil Servis, ağrı, hemşirelik, multimodal analjezi

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INTRODUCTION

Emergency services are one of the units where stress is very intense due to its complexity. For this reason, it is often impossible to make holistic evaluations in patient groups where treatment and care are critical.[1] Trauma patients are among the groups where treatment and care are critical. In cases where patient circulation and workload in emergency services are high, the immediate physiological needs of trauma patients may be more important.[1,2] However, the multidimensional nature of trauma and tissue injuries causes severe pain in patients.[3] In traumatised patients, both the cause of trauma and pain affects the patient's systems negatively.[2,4]

In trauma patients, analgesia treatment, which uses more than one analgesia method due to more than one source of pain (skin and muscle cut, nerve damage, etc.), provides more effective pain control than a single analgesic approach. Therefore, pain management of trauma patients with multiple sources of pain requires multimodal analgesia.[2-4] Multimodal analgesia combines analgesia techniques by using different analgesics' action mechanisms and provides effective pain control with low-dose analgesics.[4] Pharmacological and non-pharmacological analgesia methods are used in multimodal analgesia.[4,5] Studies have found that when multimodal analgesia is applied in trauma pain, the level of pain and the amount of analgesic consumption decrease.[5] Multimodal analgesia is based on multidisciplinary teamwork.[5-7] Nurses are the most important health professionals in the process, from evaluating pain to monitoring the effect of analgesia on the patient.[8,9]

In recent years, although the number of studies on the pain management of these patients has been predominantly, pain control cannot be achieved effectively.[5-9] Pain assessment is appropriate for the first step to control pain.[6] The patient should be actively added to the pain treatment, a valid and reliable pain assessment should be used, the weight of the pain and its location in the body should be questioned, and appropriate analgesia should be evaluated according to the type of pain, evacuation and intensive care hose. In addition, the pain evaluation should be repeated after each analgesia, and all data obtained should be recorded in the observation formula and shared with the healthcare team.[7,8] Nursing studies on multimodal analgesia in trauma patients are limited in the literature.[5-9]

This study aimed to reduce the side effects of multiple pain sources and investigate the effectiveness of multiple analgesics in trauma pain.

MATERIALS AND METHODS

Ethical Approval: Written permission was obtained from the Çukurova University Faculty of Medicine Non-Interventional Clinical Research Ethics Committee (Date: 04.01.2019, decision no: 15) and the Chief Physician of Çukurova University Medical Faculty Balcalı Hospital (Date: 12.02.2019, no: 18649120-302) for the implementation of the study. The Clinical Research Ethics Committee waived informed consent, the requirement for individual patient consent, due to the retrospective and anonymous nature of the study. The study was conducted in accordance with the principles of the Declaration of Helsinki.

Design: This retrospective and descriptive study aims to examine pain assessment and multimodal analgesia records in trauma patients.

***Setting and Sample*:** This research was conducted at a university hospital in Turkey. In the study, nurse observation forms of patients hospitalised with a diagnosis of trauma between January 1, 2018, and December 31, 2018, in the emergency unit of a university research hospital were examined. Nurse observation forms of 190 trauma patients who were 18 years of age or older, who could be contacted and who received treatment for at least 12 hours were included in the study. Non-pharmacological methods should be applied in the second plan because the reason for including patients who received treatment for at least 12 hours in trauma and because they are among the patient groups whose urgent analgesia needs should be met. Therefore, the patient groups under observation in the emergency department were included within a certain period. In addition, nurse observation forms of patients who were unconscious and could not communicate verbally (60 patients), had a history of chronic pain, alcohol and drug addiction, had metastatic disease (18 patients) and died (107 patients) were not included in the sample of the study.

***Data Collection Tools*:** The study's data were collected using the Patient Information Form (PIF) and Multimodal Analgesia Assessment Form (MAAF) created by the researchers by scanning the literature.[1-9] Pain was assessed using the Numeric Rating Scale (NRS: 0-10). The PIF consists of a total of 6 questions that includes age, sex, cause of trauma, trauma site, chronic disease, and information on medications used continuously. MAAF includes pharmacological and non-pharmacological analgesia methods. Opioids, non-opioid analgesics, and auxiliary analgesics (such as antidepressants, anticonvulsants, and local anesthetics) have been studied in pharmacological analgesia methods. In non-pharmacological analgesia methods, the application of peripheral techniques, cognitive behavioral techniques, and other non-pharmacological methods (acupuncture, hypnotherapy, etc.) were examined, and pain assessment status before and after analgesia

was questioned.

Data Collection: Data collection forms were prepared by scanning the literature, and 1-year non-electronic patient records in the Emergency Service archive were examined. The researcher examined these records for six months, from March 2019 to September 2019, and it took approximately 10-15 minutes to review each patient file.

Statistical Analysis: In the statistical analysis, descriptive data were given as numbers, mean percentages, minimum - maximum values and standard deviation. Paired sample t-test was used in normally distributed data for repeated measures of the binary dependent variable. A one-way ANOVA test was used in the data showing normal distribution in repeated measurements with more than one categorical variable. If there was a significant difference, the Bonferonni test was used from the Post Hoc analysis tests. In all tests applied, $p<0.05$ was considered statistically significant.

RESULTS

This section contains the statistical data and data of the patients included in the study. The average age of the patients included in the study is 40.94 ± 15.18, and 65.8% are male. While the reason for 47.9% of the traumas is traffic accidents, 37.9% of the patients have multiple trauma. (Table 1).

The distribution of the types of analgesia applied to the patients according to their types is given in Table 2. It was found that multimodal analgesia was applied to 71.6% of the patients, and no methods related to non-pharmacological analgesia were applied It has been determined that 32.1% of weak opioids and non-opioid analgesics are used in combination with multimodal analgesia. It was determined that while opioids were used at a rate of 16.3% and non-opioid analgesics were used at a rate of 12.1% in a single type of analgesia, among opioid analgesics, weak opioids were the most frequently used with a rate of 8.9% and acetaminophen was the most commonly used among non-opioid analgesics with the rate of 5.8% (Table 2).

Table 1. Distribution of patient information (n:190).

Demographic Information		**n (%)**
Age, Mean ± SD (Min-Max)		40.94±15.18 **(**18-80)
Gender	Male	125 (65.8)
	Female	55(34.2)
Cause of Trauma,	Traffic accident	91 (47.9)
	Penetrating tool injury	44 (23.2)
	Fall	38 (20)
	Assault	17 (8.9)
Regions of Trauma	Multiple	72 (37.9)
	Extremity	46 (24.2)
	Head-neck	40 (21.1)
	Thorax	14 (7.4)
	Abdomen	13 (6.8)
	Other (pelvis, urogenital)	5 (2.6)
Chronic Disease		41 (21.6)
Constantly Taking Medication		37 (19.5)

SD: Standard Deviation; Min: Minimum; Max: Maximum.

Table 2. Distribution of types of analgesia applied to patients (n:190).

	Types of Analgesia Applied to Patients	**n (%)**
Pharmacological Analgesia	**Single Types of Analgesia**	**54 (28.4)**
	Opioid Analgesics (Tramadol, Fentanyl, Morphine)	**31 (16.3)**
	Weak Opioid (contramal)	15 (7.9)
	Strong Opioid (fentanyl, morphine)	8 (4.2)
	Strong Opioid + Weak Opioid	8 (4.2)
	Non-Opioid Analgesics	**23 (12.1)**
	Acetaminophen (parol)	11 (5.8)
	Acetaminophen + NSAA	7 (3.6)
	NSAA (dichloron, ketorolac)	4 (2.1)
	Adjuvant Analgesics (ketamine)	1 (0.6)
	Multimodal Analgesia	
	Opioid Analgesics + Non-Opioid Analgesics	**136 (71.6)**
	Weak Opioid + Nonopioid	61 (32.1)
	Strong Opioid + Nonopioid	41 (21.6)
	Opioid + Nonopioid + Adjuvant Analgesic	34 (17.9)
Non-Pharmacological Analgesia	Peripheral Techniques	-
	Cognitive (Cognitive) Behavioral Techniques	
	Other Methods (Acupuncture, Hypnotherapy etc.)	

In Table 3, the pain was assessed at 55.7% of the patients, and it was found that pain was significantly reduced in both multimodal analgesia and patients who received a single type of analgesia (p = 0,0001). In Table 4, pain levels were examined according to the trauma characteristics and types of analgesia, and a significant difference was found between the pain levels after multimodal analgesia according to the causes of trauma (p=0.024) and the region of trauma (p=0.030). In addition, the groups this significance originated from were analysed. As a result of the analysis, a significant difference was found between falling and assault, according to the reasons for trauma after multimodal analgesia, and other regions (pelvis and urogenital), and multiple sections according to the trauma region. (p<0.05) (Table 4).

Table 3. Pain levels according to the types of analgesia of the patients (n: 106).

	Pain Levels According to the Types of Analgesia*			
	Single Type		**Multimodal**	
	Before Analgesia (n=27)	**After Analgesia (n=27)**	**Before Analgesia (n=79)**	**After Analgesia (n=79)**
Mean ± SS	7.37±1.41	2.55± 1.21	8.10±1.47	1.26±1.16
(Min-Max)	(5-10)	(1-6)	(4-10)	(0-6)
Statistical Evaluation	t=17.036		t=-37.489	
t-test / p	**p=0.0001**		**p=0.0001**	

*: Percentage of patients assessed for pain: 55.7%; Min: Minimum; Max: Maximum.

Table 4. Distribution of pre and post-analgesia pain levels according to trauma information (n: 106).

Trauma Information		**Pain Levels According to Types of Analgesia**			
		Single Type		**Multimodal**	
		Before Analgesia Mean ± SD	**After Analgesia** Mean ± SD	**Before Analgesia** Mean ± SD	**After Analgesia** Mean ± SD
Cause of Trauma	Traffic accident	7.33±1.37	2.83±1.41	8.25±1.51	1.23±0.97
	Penetrating tool injury	7.50±0.92	2.25±1.03	7.93±1.52	1.37±1.14
	Fall*	6.83±1.83	2.33±0.81	8.00±1.36	0.80±0.94
	Assault*	-	-	7.60±1.51	2.60±2.30
Statistical Evaluation		f=1.550	f=0.455	f=0.431	f=3.331
		p=0.228	p=0.716	p=0.732	**p=0.024**
Regions of Trauma	Multiple*	6.90±1.51	2.45±0.93	8.00±1.39	1.15±1.01
	Extremity	7.44±1.42	2.88±1.05	8.25±1.43	1.18±1.10
	Head-neck	7.66±0.57	1.33±0.57	8.00±1.60	1.22±1.11
	Thorax	9.50±0.70	4.50±2.12	8.83±0.98	1.50±1.04
	Abdomen	7.00±0.00	1.50±0.70	7.60±2.19	1.00±1.00
	Other (pelvis, urogenital)*	-	-	8.50±2.12	4.00±2.82
Statistical Evaluation		f=1.638	f=3.634	f=0.505	f=2.641
		p=0.200	**p=0.020**	p=0.772	**p=0.030**

*: Bonferonni p values of Post-hoc multiple comparison test.

DISCUSSION AND CONCLUSION

Due to their complex and dense structure, in emergency units, the physiological needs of patients are generally prioritised while pain control can be ignored. However, pain control is very important in trauma patients where treatment and care are critical. In this context, multimodal analgesia is recommended for trauma patients with multiple pain sources. [1,2]

In our study, the rate of applying multimodal analgesia was 71.6%, which is between 6.6% and 42.8% of trauma patients in the literature.[6,10,11] The published guidelines stated that appropriate multimodal analgesia techniques should be applied to the patient in acute pain.[4,9,12,13] Studies have shown that multimodal analgesia reduces pain, the amount of opioid consumption, and severe the side effects such as respiratory depression.[7,8,14] Burton et al.[15] determined that multimodal pain management reduces the number of opioids used and the prescribed dose in patients with thoracic trauma. Similarly, Hatton et al.[16] found that multimodal pain management applied in elderly patients decreased the number of opioids used and, thus, the complications. The most important reason is that the multiple analgesia met-

hod is thought to provide effective analgesia because it affects both peripheral and central pain sources and causes fewer side effects at low doses.

This study has shown that a single type of analgesia was applied to 28.4% of hospitalised patients due to trauma. It is observed that weak opioids are used more frequently among opioids, and acetaminophen is used in non-opioids as a single type of analgesia. In the literature, it is seen that weak opioids[6,17] and NSAAs are frequently preferred for trauma pain.[18,19] Hatton et al.[19] determined pain relief in pain treatment in which only NSAAs are applied, but analgesia alone is insufficient in patients with severe trauma. This situation confirms that trauma pain originates from multiple sources, including peripheral oedema and inflammation. As a matter of fact, in severe acute pain such as the pain of trauma, pain guidelines recommend that strong opioids and multimodal analgesia should be preferred first.[9,12,13,20] However, studies in the literature show that healthcare professionals avoid opioid use even if the pain is severe, so multimodal analgesia is not used frequently.[20,21] This is thought to be due to the severe side effects of opioids.[22] Although opioids continue to be used as the "gold standard" for pain management,[13] may lead healthcare professionals to be cautious in the early stages of trauma to avoid the risk of respiratory depression and opioid addiction in the patient.

Our study has shown that adjuvant analgesics were used in 21.6% of the patients who received multimodal analgesia. Similarly, in a study of trauma patients, approximately one-third of patients received adjuvant analgesics.[23] In our study, it is seen that only ketamine was preferred among the auxiliary analgesics. Oddo et al. stated that ketamine should be used with opioid analgesia in patients with severe head trauma.[24] Aminiahidashti et al.[25] found that the combination of ketamine and propofol causes fewer respiratory problems and provides more effective analgesia in addition to the sedation effect in emergency departments. Since ketamine reduces intracranial pressure and provides analgesia, it has been preferred in head trauma in recent years.[25,26] However, although it is known that adjuvant analgesics have fewer side effects, their use in practice is not common. This situation suggests that the beliefs of healthcare professionals in the analgesic effectiveness of adjuvant analgesics are weak, and therefore they are not used sufficiently.

Comprehensive pain assessment ensures patient involvement in pain management and allows the nurse to evaluate the effectiveness of pain management. Therefore, evaluating patient outcomes for effective pain assessment and management plays a "key role" in effective pain management.[3] When the nurse observation forms included in the study were examined, it was determined that nurses evaluated pain only in 55.7% of trauma patients (Table 3). When the nurse observation forms included in the study were examined. When the literature was reviewed, many studies showed that pain assessment was generally not performed in patients.[3,5,27] Erden et al.[3] examined the pain assessment records of nurses and stated that they did not use any pain scales to assess pain or record pain. At the same time, Samarkandi[27] reported that nurses had insufficient knowledge of pain assessment. Rafati et al.[28] stated that nurses did not use a standard scale when assessing pain, and pain severity was included in only 6% of the records. In this context, the reasons for the inadequate assessment of pain in patients in the emergency room may be related to the high workload of nurses and the continuous variation in the number of patients due to emergency room conditions.

In this study, pain levels were significantly reduced after analgesia in patients who received both multimodal and single types of analgesia ($p < 0.05$). When the literature is reviewed, it is seen that the pain of patients who undergo multimodal analgesia is reduced and is consistent with our study.[2,6-9,29] In studies conducted with patients with thoracic trauma, it was reported that pain levels significantly decreased after multimodal analgesia.[7,8] Similarly, in another study in which both single and multimodal analgesia was applied, it was found that more effective pain control was achieved in patients who received multimodal analgesia.[29] Based on these data, we emphasise the effectiveness of multimodal analgesia in controlling trauma pain, which is both severe and has multiple pain sources.

In our study, it was found that pain significantly decreased in all trauma regions after multimodal analgesia ($p<0.05$, Table.3). According to results obtained from the limited number of studies in the literature, it was found that pain was significantly reduced in the abdominal and pelvis region.[18] Findings in the literature show that different patient characteristics, trauma sites, and tissue damage levels can lead to different pain levels after multimodal analgesia, and in another study in the head-neck, abdominal, thoracic, and spinal regions.[30]

In conclusion, in this study, even if pain assessment was not performed in all patients, it was determined that the pain levels of the patients administered multimodal analgesia decreased. Accordingly, this study supports the treatment of trauma pain with multiple sources of pain with a multimodal analgesia approach. In addition, it was observed that pain assessment was not performed as recommended in the pain guidelines, and there was a lack of records. As nurses, we must increase our awareness of the importance of pain assessment records for effective pain management.

Ethics Committee Approval: Written permission was obtained from the Çukurova University Faculty of Medicine Non-Interventional Clinical Research Ethics Committee (Date: 04.01.2019, decision no: 15) and the Chief Physician of Çukurova University Medical Faculty Balcalı Hospital (Date: 12.02.2019, no: 18649120-302) for the implementation of the study. Informed consent, the requirement for individual patient consent was waived by the Clinical Research Ethics Committee due to the retrospective and anonymous nature of the study. The study was conducted in accordance with the principles of the Declaration of Helsinki.

Conflict of Interest: No conflict of interest was declared by the authors.

Author Contributions: Concept – IT, SE; Supervision – IT, SE; Materials – IT, SE; Data Collection and/or Processing – IT, SE; Analysis and/or Interpretation – IT, SE; Writing – IT, SE.

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Investigation of the Relationship between Physical Activity Levels and Menstrual Symptoms in Healthy Women

Sağlıklı Kadınlarda Fiziksel Aktivite Seviyesi ve Menstrual Semptomlar Arasındaki İlişkinin İncelenmesi

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ABSTRACT

Objective: This study was conducted to investigate relationship between physical activity levels and menstrual symptoms in healthy women.

Materials and Methods: Healthy women with regular menstruation (n=133, 21.80±2.45 years) included in current study. In the first three days of menstrual cycle, severity of menstrual pain (Visual Analog Scale), menstrual symptoms (Menstruation Symptom Scale (MSS)), and physical activity levels (Recent Physical Activity Questionnaire) were evaluated in these women.

Results: Mean duration of women's menstruation was 5.95±1.68 days, menstrual pain score was 6.22±2.82, total MSS score was 3.36±0.76, and total physical activity score (PAS) was 26.08±26.93 hours*day*MET. There were significant positive correlations between domestic activities PAS and the score of menstrual pain symptoms and between duration of menstruation and pain scores and mean scores on total MSS, negative effects/somatic complaints, menstrual pain symptoms, and coping methods ($p<0.05$).

Conclusion: As menstruation duration, pain of menstruation and physical domestic activities increased in women with regular menstruation, the severity of symptoms increased. Therefore, the effects of methods reducing menstrual symptoms should be investigated in further studies. We recommend that women reduce their physical activities at home during menstruation, support this process with relaxation practices, and continue their physical activities after menstruation period is over.

Keywords: Menstrual cycle, menstrual symptoms, pain, physical activity

ÖZ

Amaç: Bu çalışmada sağlıklı kadınlarda fiziksel aktivite seviyeleri ve menstrual semptomlar arasındaki ilişkiyi araştırmak amaçlandı.

Materyal ve Metot: Bu çalışmaya düzenli adet gören sağlıklı kadınlar (n=133, 21,80±2,45 yıl) dahil edildi. Bu kadınlarda menstrual döngünün ilk üç günü içerisinde menstrual ağrının şiddeti (Görsel Analog Skalası), menstrual semptomlar (Menstruasyon Semptom Ölçeği (MSÖ)) ile fiziksel aktivite seviyesi (Yakın Zamanlı Fiziksel Aktivite Anketi) değerlendirildi.

Bulgular: Kadınların ortalama menstruasyon süresi 5,95±1,68 gün, menstruasyon ağrısı 6,22±2,82 puan, toplam MSÖ puanı ise 3,36±0,76 ve toplam fiziksel aktivite puanı (FAP) 26,08±26,93 saat*gün*MET'ti. Ev aktiviteleri FAP ile menstrual ağrı belirtileri puanları arasında ve menstruasyon süresi ve ağrı puanı ile toplam MSÖ, negatif etkiler/somatik yakınmalar, menstrual ağrı belirtileri ve baş etme yöntemleri puanları arasında pozitif yönde anlamlı korelasyon vardı ($p<0,05$).

Sonuç: Çalışmamızın sonuçlarına göre kadınlarda menstruasyon süresi, ağrısı ve ev içinde yapılan fiziksel aktiviteler arttıkça menstrual döneme ait semptomların şiddeti de artmaktadır. Bu nedenle menstrual semptomları azaltmaya yönelik yöntemlerin etkileri ileri çalışmalarda araştırılmalıdır. Kadınların menstruasyon dönemlerinde ev içindeki fiziksel aktivitelerini azaltarak gevşemeye yönelik uygulamalarla bu süreci desteklemeleri, menstruasyon dönemi bittikten sonra da fiziksel aktivitelerini sürdürmelerini önermekteyiz.

Anahtar Kelimeler: Ağrı, fiziksel aktivite, menstrual semptomlar, menstrual siklus

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INTRODUCTION

Menstruation, which is seen as a symbol of the transition to womanhood in girls, is the beginning of an important process that affects women, their families and societies due to the accompanying symptoms.[1] There may be different symptoms that occur during or before the menstrual phase of a menstrual cycle,[1] which is a normal physiological event due to changes in sex hormone levels.[2] Generally, menstrual symptoms are classified as dysmenorrhea, which is associated with menstrual-related pain symptoms, or premenstrual syndrome (PMS), which is associated with emotional or psychological symptoms.[3] The PMS is defined as a combination of symptoms that begin within five days before menstruation and disappear within four days after the menstrual phase. These symptoms can be grouped as somatic and affective. Affective symptoms include depression, tantrums, irritability, anxiety, and social isolation while somatic symptoms include breast tenderness, abdominal bloating, headache, and extremity edema.[3] Due to medical and social results of all these symptoms and dysmenorrhea,[1] menstrual symptoms may afflict progress of education life, daily living activities, and social activities in women which reduce their quality of life.[4]

Although it is commonly known that menstruation may restrict daily living of women,[1,4] some research papers in the literature have demonstrated that hormone fluctuations occurring in the menstrual period may have no considerable effect on exercise performance, maximal oxygen consumptions, heart and lung response to exercise or muscle contractile characteristics in female athletes with regular menstrual cycle.[5,6] On the other hand, doing regular physical activity improves mental health by reducing anxiety, depression, and negative mood.[7] People with a high level of physical activity have a lower incidence of anxiety and depression than those with a low level of physical activity.[8,9] Studies have shown that physical activity is an effective treatment for anxiety and depression, as well.[10] That is, being physically active is an important key to prevent mental health disorders and improve existing mental health problems. However, the association between these menstrual symptoms and exercise and/or physical activities in sedentary women has not been studied to our knowledge until now.

Based on this knowledge, being more physically active may be associated with fewer menstrual symptoms in women. However, this issue has not yet been clarified, to date. Therefore, this study was conducted to investigate the relationship between physical activity levels and menstrual symptoms in healthy women.

MATERIALS AND METHODS

Ethics Committee Approval: Approval of the ethics committee of Sivas Cumhuriyet University Non-Interventional Clinical Research was obtained for this cross-sectional study (date: 27.04.2022; decision number: 2022-04/20). Consent of the women who volunteered to participate in the study was obtained. The study was conducted in accordance with the Declaration of Helsinki.

Studying Group: The healthy women included in the study were selected on a voluntary basis among those who were aged ≥18 years and had a regular menstrual cycle. Exclusion criteria were having any orthopedic, neurological, or cardiovascular system diseases that prevent physical activity, being pregnant, having any accident or trauma in the last six months that prevents physical activity or having a history of injury to the lower extremities, and having used oral contraceptives or other hormone medications at least three months before participating in the study.[11]

Data Collection: The healthy women were reached through social media and close circles. The link to an online questionnaire created on Google Forms was sent to the women who met the inclusion criteria via e-mail or messaging applications on their mobile phones (SMS, WhatsApp, etc.). The women participating in the study were evaluated only once during their menstrual phase, and the assessment was made within the first three days of the menstrual cycle. General participant data (age, height, body weight, education, marital status, presence of pregnancy status, presence of previous illness or surgery, medications used and their duration, presence of oral contraceptives or other hormonal drugs usage, sleep duration, smoking status, status of cigarette and alcohol usage, the presence of regular menstruation, and menstrual cycles duration) were recorded.

Assessment of Pain: The visual analog scale (VAS) was used to determine the severity of menstrual pain in women.[12] The degree of pain felt by women during their last menstrual period was questioned and the pain severity score they determined was recorded.

Assessment of Menstrual Symptoms: The Menstruation Symptom Scale (MSS) was used to evaluate the menstrual symptoms of the women participating in our study. This scale was developed by Chesney and Tasto in 1975. Turkish validity and reliability study was conducted by Güvenç et al. in 2014.[13] The scale consists of 22 items and has a five-point Likert -type structure. Items 1-13 belong to the “negative effects/somatic complaints” sub-dimension, 14-19 to the “menstrual pain symptoms” sub-dimension, and 20-22 to the "coping methods" sub-dimension. The MSS score is found by calculating the mean of the

total scores of the items on the scale. A high mean score indicates an increase in the severity of menstrual symptoms. The score of each sub-dimension is calculated.[13,14]

Assessment of Physical Activity Level: The Recent Physical Activity Questionnaire (RPAS) was used to evaluate physical activity. The validity and reliability studies of the questionnaire in Turkey were carried out by Daşdemir et al.[15] RPAS questions physical activity in the past four weeks. The questionnaire consists of a total of nine questions covering four areas.[16,17] The first part is about domestic activities, the second part is about activities at work, and the third part is about leisure activities. All activities were classified according to their intensity as sedentary, mild, moderate, and vigorous.[17] The physical activity score (PAS) in the form of energy consumption for four different areas (home, work, transportation, and leisure) is calculated by multiplying the duration of each activity (hours/day) with the MET value corresponding to each activity. Total energy consumption (total PAS) is calculated by summing the energy consumption evaluated for each area.[16]

Statistical Analyses: Sample size of the study was calculated using the Raosoft sample size calculator software (http://www.raosoft.com/samplesize.html., access date: April 21, 2022). Based on the estimated population (82 individuals with low physical activity levels) and response distribution as proportion of women with premenstrual syndrome to 47.6% who do low-intensity physical activity, the required sample size was calculated as at least 64 women based on a confidence level of 90% and a 5% type-1 margin of error.[18]

Statistical analyses were performed on SPSS 15.0 software package. The conformity of all variables to the normal distribution was investigated using visual (histogram and probability plots) and analytical methods (Kolmogorov-Smirnov/Shapiro-Wilk tests). Descriptive analyses were presented using frequency (n) and percentage (%) values for categorical variables, median and interquartile range (IQA) for non-normally distributed variables and mean and standard deviation (x±sd) values for normally distributed variables. Independent samples t-test (student t-test) was used to compare the variables that showed a normal distribution, and the Mann-Whitney U test was used to compare the variables that did not. The Chi-square test was used to compare the categorical variables.

The relationships between non-normally distributed variables were determined using Spearman correlation, and the relationships between normally distributed variables were determined using the Pearson correlation analysis method. In the statistical analysis, the probability of Type-1 error was determined as $p<0.05$.

RESULTS

Demographic and descriptive characteristics of 133 healthy women included in the study are given in Table 1. The mean menstrual duration of the women was 5.95±1.68 days, menstrual pain score was 6.22±2.82 (Table 1).

Table 1. Demographic and descriptive characteristics of participants.

		Participants (n=133) x±sd / median (IQR)
Age (years)		21.80±2.45
Height (m)		1.65±0.06
Body weight (kg)		58.78±9.17
Body mass index (kg/m^2)		21.52±3.04
Sleep time (hours)		7.50±1.27
Regular menstruation cycle time (day/month)		26.60±4.78
Period of regular menstruation (days)		5.95±1.68
Menstrual pain (VAS, 0-10)		6.22±2.82 / 7 (4)
Education level (n (%))	**High school**	5 (3.76%)
	University	125 (94%)
	Master's degree	1 (0.75%)
	Doctorate	2 (1.5%)
Marital status (n (%))	**Single**	130 (97.7%)
	Married	3 (2.3%)
Presence of pregnancy (n (%))		0
Those who gave birth (n (%))		0
Smokers (n (%))		37 (27.8%)
Those with chronic disease (n (%))		15 (11.3%)
Those who have undergone surgery (n (%))		2 (1.5%)

m: Meters; kg: Kilograms; VAS: Visual analogue scale; n: Frequency; %: Percent; x: Mean, sd: Standard deviation; IQR: Interquartile range.

As shown in Table 2, total MSS score was 3.36±0.76, and total PAS was 26.08±26.93 hours*day*MET.

Table 3 explains that there was a statistically significant positive and low correlation between women's domestic activities PAS and the scores of menstrual pain symptoms ($p<0.05$), but there was no statistically significant correlation between other total physical activity and physical activity subscale scores and the mean scores on the total MSS and its subscales ($p>0.05$).

As presented in Table 4, there was a statistically significant negative and low correlation between women's mean duration of sleep and total PAS, work activity PAS, and scores for the duration of mild activity ($p<0.05$). Moreover, there was a statistically significant positive correlation between the duration of menstruation and mean menstruation pain scores and mean scores on the total MSS, and negative effects/somatic complaints, menstrual pain symptoms, and coping methods subscales (Table 4, $p<0.05$).

Table 2. Physical activity level and menstrual symptoms of participants.

	Participants (n=133) x±sd /median (IQR)
Total PAS (hour*day*MET)	26.08±26.93 / 18.71 (25.66)
Home activity PAS (hour*day*MET)	4.66±4.08 / 3.37 (4.74)
Business activity PAS (hour*day*MET)	8.38±13.03 / 0 (14)
Leisure activity PAS (hour*day*MET)	12.72±23.34 / 6.52 (13.82)
Transportation activity PAS (hour*day*MET)	0.32±1.52 / 0 (0)
Sedentary activity duration (hours)	5.18±3.02 / 4.79 (4.25)
Light-intensity activity duration (hours)	1.07±2.02 / 0.01 (1.12)
Moderate activity duration (hours)	0.99±1.27 / 0.49 (1.19)
Duration of vigorous activity (hours)	0.11±0.39 / 0.01 (0.06)
MSS total score (1-5)	3.36±0.76
Negative effects/somatic complaints (1-5)	3.34±0.75
Menstrual pain symptoms (1-5)	3.55±0.89 / 3.67 (1)
Coping methods (1-5)	3.07±1.29 / 3.33 (2.17)

PAS: Physical activity score; MET: Metabolic equivalent; MSS: Menstruation symptom scale; n: Frequency; x±sd: Mean±Standard deviation; IQR: Interquartile range.

Table 3. The relationship between the scores of the Recent Physical Activity Questionnaire and Menstruation Symptom Scale of participants.

	MSS total score (1-5)		**Negative effects/somatic complaints (1-5)**		**Menstrual pain symptoms (1-5)**		**Coping methods (1-5)**	
	r	**p**	**r**	**p**	**r**	**p**	**r**	**p**
Total PAS (hour*day*MET)	0.118	0.177	0.069	0.431	0.135	0.122	0.119	0.173
Home activity PAS (hour*day*MET)	0.012	0.891	-0.022	0.803	**0.190**	**0.028***	-0.053	0.547
Business activity PAS (hour*day*MET)	0.103	0.236	0.077	0.377	0.015	0.865	0.157	0.072
Leisure activity PAS (hour*day*MET)	0.018	0.833	-0.011	0.896	0.057	0.515	-0.019	0.828
Transportation activity PAS (hour*day*MET)	0.027	0.756	0.003	0.968	-0.044	0.614	0.122	0.160
Sedentary activity duration (hours)	-0.115	0.188	-0.109	0.213	0.021	0.809	-0.156	0.074
Light-intensity activity duration (hours)	0.102	0.244	0.112	0.201	0.020	0.816	0.111	0.205
Moderate activity duration (hours)	0.035	0.690	-0.005	0.957	0.079	0.369	0.014	0.876
Duration of vigorous activity (hours)	0.037	0.672	0.038	0.664	0.114	0.190	-0.062	0.477

PAS: Physical activity score; MET: Metabolic equivalent; MSS: Menstruation symptom scale; r: Correlation coefficient; p: p value; Spearman Correlation test: *: p<0;05.

Table 4. The relationship between sleep duration, physical activity level and menstrual symptoms in partici-

	Sleep time (hours)		Period of menstruation (days)		Menstrual pain (VAS, 0-10)	
	r	p	r	p	r	p
Total PAS (hour*day*MET)	**-0.280**	**0.001**[*]	0.141	0.105	0.167	0.054
Home activity PAS (hour*day*MET)	0.010	0.905	0.001	0.996	-0.035	0.693
Business activity PAS (hour*day*MET)	**-0.293**	**0.001**[*]	-0.009	0.918	0.144	0.099
Leisure activity PAS (hour*day*MET)	-0.080	0.361	0.166	0.056	0.070	0.426
Transportation activity PAS (hour*day*MET)	-0.149	0.087	0.081	0.356	0.110	0.208
Sedentary activity duration (hours)	-0.058	0.511	-0.152	0.081	-0.163	0.061
Light-intensity activity duration (hours)	**-0.205**	**0.018**[*]	0.128	0.141	0.071	0.419
Moderate activity duration (hours)	-0.148	0.089	0.162	0.063	0.083	0.340
Duration of vigorous activity (hours)	0.055	0.527	0.124	0.155	-0.047	0.594
MSS total score (1-5)	0.043	0.624	**0.344**	**0.001**[#]	**0.651**	**0.001**[*]
Negative effects/somatic complaints (1-5)	0.066	0.448	**0.309**	**0.001**[#]	**0.494**	**0.001**[*]
Menstrual pain symptoms (1-5)	0.012	0.892	**0.273**	**0.001**[*]	**0.548**	**0.001**[*]
Coping methods (1-5)	-0.031	0.726	**0.224**	**0.009**[*]	**0.702**	**0.001**[*]

PAS: Physical activity score; MET: Metabolic equivalent; MSS: Menstruation symptom scale; r: Correlation coefficient; p: p value; Pearson Correlation test; [#]: $p<0.05$; Spearman Correlation test; [*]: $p<0.05$.

DISCUSSION AND CONCLUSION

As a result of the study, in which we investigated the relationship between physical activity levels and menstrual symptoms in healthy women, there was a positive relationship between domestic activities PAS and scores of menstrual pain symptoms, a negative relationship between sleep duration and total PAS, work activity PAS, and scores for the duration of mild activity, and a positive relationship between the duration of menstruation and mean scores for menstruation pain and mean scores on the total MSS, negative effects/somatic complaints, menstrual pain symptoms, and coping methods subscales.

Exercise is known to act as a non-specific analgesic by improving pelvic blood circulation and stimulating the release of beta-endorphins.[19] In a study by Salehi et al.[20], the effects of eight-week Pilates exercise on menstrual pain and its duration were investigated in women with and without primary dysmenorrhea. In conclusion, it was reported that exercise training improved the severity and duration of pain in women with primary dysmenorrhea.[20] In another study involving women with premenstrual symptoms, the effects of aerobic exercise training and yoga exercises applied regularly for one month on pain and premenstrual symptoms were investigated. It was found that both pain intensity and premenstrual symptoms decreased in women in both exercise groups. However, yoga exercises were found to be more effective in relieving premenstrual symptoms than aerobic exercise training.[21] No exercise program was applied to the women included in our study; only the amount of physical activity in the last month was questioned. As a result of our study, it was found that as the amount of physical activity performed by healthy women at home increased, menstrual pain increased, as well. Although our results look different from those of the literature, the effects of regular exercise have been questioned in the literature. Since exercise and physical activity are different concepts, it is normal for the results to be different. Menstrual pain may have increased due to the wrong posture and prolonged housework. Studies in the literature have examined the effects of exercise performed by specialist health professionals. Including domestic activities in the content of physical activity counseling in public health protection programs and providing education on doing housework appropriately and within certain hours can be a solution to this problem. On the other hand, in a study, in which the relationship between physical activity levels and premenstrual symptoms in women was directly questioned, university students were evaluated. It was reported that the physical activity levels of women with the premenstrual syndrome were lower than those of healthy women and that the incidence of premenstrual syndrome decreased as the level of physical activity increased.[22] In a randomized controlled study examining the effect of swimming on premenstrual symptoms, premenstrual symptoms were evaluated with the help of a questionnaire. The study was concluded that premenstrual symptom severity in the swimming group was lower than in the control group.[23] In a systematic review, it was emphasized that the exercise may be beneficial in alleviating symptoms as an effective method for the treatment of premenstrual syndrome.[24] In another study examining the effect of aerobic exercise on the physical symptoms of premenstrual syndrome, the intervention group performed exercise for 20 minutes per a day, 3 days per a week and totally 8 weeks. As a result, it was determined that there was a significant decrease in the severity of physical symptoms such as bloating, nausea, vomiting, hot flashes, and increased appetite in the aerobic exercise group. Therefore, it was con-

cluded that aerobic exercise is a valuable way to treat the physical symptoms of premenstrual symptoms.[25] In our study, a physical activity questionnaire, which is used to do a detailed evaluation of women's domestic, workplace, and leisure activities and is longer than its counterparts, was used, and no correlation could be found between physical activities other than domestic activities and menstrual symptoms. The reason for this difference may be because the evaluation methods used in this study[22] were employed to evaluate physical activities more generally and the sample size was different. In another study, the physical activity levels of women with and without primary dysmenorrhea were questioned by using the International Physical Activity Questionnaire, and it was found that the physical activity levels of women with primary dysmenorrhea were significantly higher.[26] These results support our results that as the physical domestic activities increase, the symptoms also increase. The high amount of physical activity may cause women to do strenuous uncontrolled activities during the menstrual period. However, exercises to be done with the consultancy of a specialist can help reduce the severity of menstrual pain, as stated in the literature, as it will provide controlled exercise. In the literature, it has been stated that women need to work more for less total work than men depending on their body mass, and it is emphasized that women have less capacity than men to complete the upper extremity exercise protocol.[27] The fact that housework activities involve more upper extremity movements by nature may also cause women to have difficulty and increase menstrual symptoms.

Day 1 to 5 of the menstrual cycle is called menstruation, and the duration of menstruation is variable. The normal duration of menstruation is 3-5 days.[28] In a study on the relationship between menstruation duration and pain and menstrual symptoms in the literature, it was found that women with a longer menstrual period or more pain had higher depressive mood changes and eating tendencies.[29] Similarly, in another study involving women, it was reported that women with prolonged menstruation had more pain and experienced more menstrual symptoms.[30] Consistent with the results of these studies, in our study, women with longer menstrual duration and more pain experienced more menstrual symptoms. We think that strategies to be developed to reduce pain will also play a role in reducing menstrual symptoms.

To reach more individuals in current study, the evaluations were made within the first three days of the menstrual cycle as in similar studies in the literature. However, it would be better if all women included in the study were evaluated on the same day of the menstrual cycle. This may be a limitation of our study.

In conclusion, menstruation, which is a natural physiological process, is perceived as a different experience by every woman. For this process to be positive and smooth, we recommend that women reduce their physical activities at home during menstruation, support this process with relaxation practices, and continue their exercise programs after the menstruation period is over in line with the recommendations of health professionals who are knowledgeable about exercise. In future studies, the effect of methods that reduce menstrual symptoms should be investigated in detail.

Ethics Committee Approval: Ethical approval for the study was obtained from the Non-Interventional Clinical Research Ethics Committee of Sivas Cumhuriyet University (date 27.04.2022; decision number: 2022-04/20). The study was conducted in accordance with the Declaration of Helsinki.

Conflict of Interest: No conflict of interest was declared by the authors.

Author Contributions: Concept - SSK; Supervision – SSK, GB; Materials – SSK; Data Collection and/ or Processing – SSK, GB; Analysis and/ or Interpretation – SSK, GB; Writing – SSK, GB.

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Investigating the Necessity of Radiological Analysis in Pulled Elbow

Çekilmiş Dirsek Sendromunda Radyolojik Analizin Gerekliliğinin İncelenmesi

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ABSTRACT

Objective: Primary objective was to reveal the necessity of radiological analysis by investigating the differences in radiological findings in the pulled and intact sides of pulled elbow patients. The secondary objective was to examine pulled elbow patients' demographic and radiographic distributions to reveal recurrence-related risk factors.

Materials and Methods: In this retrospective prognostic study, 80 patients, treated for pulled elbow between August 2019 and January 2022 were examined. The patient's gender, age, side, and injury mechanism information were evaluated. The radio-capitellar line, the radial epiphyseal angle, and the humero-ulnar angle were evaluated on both injured and intact side X-rays.

Results: No missed fractures were detected, and no significant difference was found between injured and intact sides in the radiological analysis ($p>0.05$). Recurrent dislocations were detected in 14 patients (17.5%). No significant relationship was found between recurrent pulled elbow and gender, side, mechanism of injury, and radiological findings ($p>0.05$).

Conclusion: Although radiographic examination of the pulled elbow is not diagnostically and prognostically necessary, radiographs of the elbow can be taken and examined regarding fracture exclusion and medicolegal concerns. There is no obvious risk factor predicting recurrent dislocation.

Keywords: Humero-ulnar angle, pulled elbow, radial epiphyseal angle, radio-capitellar line, radiological analysis

ÖZ

Amaç: Birinci amaç, çekilmiş dirsek hastalarının yaralanmış ve sağlam taraflarının radyolojik bulgularındaki farklılıkları araştırarak radyolojik incelemenin bu hastalardaki gerekliliğini ortaya koymaktır. İkinci amaç, nüks ile ilişkili risk faktörlerini ortaya çıkarmaktır.

Materyal ve Metot: Bu retrospektif prognostik çalışmada, Ağustos 2019 ile Ocak 2022 tarihleri arasında çekilmiş dirsek nedeniyle tedavi edilen 80 hasta incelendi. Hastaların cinsiyeti, yaşı, tarafı ve yaralanma mekanizması bilgileri değerlendirildi. Radyo-kapitellar hat, radyal epifiz açı ve humero-ulnar açı hem kırık hem de sağlam taraf grafilerinde değerlendirildi.

Bulgular: Radyolojik analizde gözden kaçmış kırık saptanmadı ve yaralı ve sağlam taraflar arasında radyolojik açıdan anlamlı fark bulunmadı ($p>0,05$). 14 hastada (% 17,5) tekrarlayan çekilmiş dirsek saptandı. Tekrarlayan çekilmiş dirsek ile cinsiyet, taraf, yaralanma mekanizması ve radyolojik bulgular arasında anlamlı bir ilişki bulunmadı ($p>0,05$).

Sonuç: Çekilmiş dirseğin radyografik değerlendirilmesi tanısal ve prognostik olarak gerekli olmasa da kırık ekartasyonu ve medikolegal kaygılar açısından radyografik incelemeler gerekebilir. Tekrarlayan çıkığı öngören belirgin bir risk faktörü yoktur.

Anahtar Kelimeler: Çekilmiş dirsek, humero-ulnar açı, radyal epifiz açısı, radyolojik analiz, radyo-kapitellar hat

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INTRODUCTION

Pulled Elbow (Nursemaid's Elbow), with an annual incidence of up to 2.6%, is a rare elbow injury that can be explained by the slipping over of the radial head, because of the weak annular ligament and increased ligamentous laxity, usually after sudden and severe traction of the arm.[1,2] As with other ligamentous laxity-related pathologies, it is generally reported more commonly in girls.[2-4] and clinical projection is usually a frightened child younger than six years of age who, following a history of traction on the upper extremity, tries to keep the arm still and has pain with active movement.[1,2,5] The pulled elbow is usually diagnosed with an anamnesis and physical examination, and a radiological examination is not required for diagnosis. Closed reduction manoeuvres of hyperpronation or supination-flexion, which are applied in the emergency service, are recommended for the treatment.[2,5-7] Although its recurrence is reported to be low, recurrence rates of up to 46% have been reported in some series.[1]

Although direct radiographs are not usually required for diagnosis, comparative bilateral radiographs are usually requested in clinical practice in patients who apply to the emergency department suspected of a pulled elbow. The reasons for this include atypical findings accompanying pulled elbow, suspicion of child abuse, history other than traction of the upper arm, risk of fracture, and medicolegal concerns.[2,8-10] On the other hand, the necessity of a radiographic examination of the pulled elbow is still a matter of debate.

Our primary objective was to reveal the necessity of radiological analysis by investigating the differences in radiological findings in the pulled and intact sides of pulled elbow patients with elbow X-rays. Our secondary objective was to examine pulled elbow patients' demographic and radiographic distributions to reveal recurrence-related risk factors.

MATERIALS AND METHODS

Ethics Committee Approval: Our study was approved by the Clinical Research Ethics Committee of Ankara City Hospital (Date: 23.03.2022, decision no: E1-22-2500). The study was carried out under the International Helsinki Declaration of human rights.

Studying Group: In this retrospective prognostic study, patients consulted to our clinic with the suspicion of a pulled elbow between August 2019 and January 2022 were examined. All patients were included in the study with a confirmed case of the unilaterally pulled elbow and treated with either hyperpronation or supination-flexion manoeuvres implemented in the emergency department. Exclusion criteria were defined as; patients with recurrent or bilateral pulled elbows or a history of elbow fracture on either side, patients with accompanying systemic musculoskeletal diseases, patients who do not have a comparative bilateral elbow radiograph at the first admission, and patients who refused to come to follow-ups. Following inclusion and exclusion criteria, 80 patients were evaluated retrospectively.

Data Collection: In the radiological examination, all measurements were performed by the same radiologist (ISD) with more than ten years of experience. A total of four radiological examinations were performed on X-ray images, three in the anteroposterior and one in the lateral view. In addition, all x-rays were reevaluated for missed fractures. The radio-capitellar line, which has diagnostic significance in children with radial head dislocations,[11] were evaluated on both anteroposterior and lateral radiographs. In this measurement, it was examined whether the imaginary line drawn at the radius neck passed through the capitellum (Figure 1).

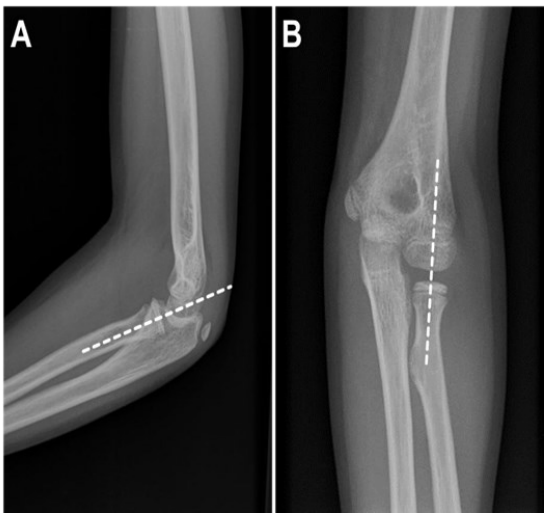

Figure 1. Radio-capitellar line. The radio-capitellar line, the imaginary line drawn passing through the center of the radius neck, should pass through the capitellum on both anteroposterior and lateral planes.

Radial epiphyseal angle (RE) and humero-ulnar angle (HU) were also evaluated on both fractured and intact side anteroposterior radiographs of all patients to evaluate the necessity of radiological examination of the pulled elbow (Figure 2).

The radial epiphyseal angle is defined as the angle at the proximal lateral edge of the point where the first line is drawn along the long axis of the humerus and the second line passing through the radial head epiphysis intersects. In contrast, the humero-ulnar angle is defined as the angle between the long axes of the humerus and ulna.[12] The patient's gender, age, side, and injury mechanism information were evaluated to determine recurrence-related risk factors. Injury mechanisms were categorised under two subheadings as direct upper extremity traction and fall. All patients' families were called for control follow-ups from the phone numbers in the patient files. In the control follow-ups, whether the patients had recurrent pulled elbows was questioned. In addition, it was evaluated whether there was a limitation in the range of motion of the joint in comparison with the opposite elbow.

Statistical Analyses: In descriptive statistics, median, interquartile range, minimum and maximum values are used for continuous data, and frequency and percentage values are given in categorical data. Compliance of continuous data with normal distribution was checked with the Kolmogorov-Smirnov test. The Mann-Whitney U test was used to compare whether there was a difference between the groups in the data that were not normally distributed. Categorical comparisons were made using Pearson chi-square and Fisher's Exact tests. Statistical Package for Social Sciences (SPSS) 26.0 program was used in the evaluations, and the statistical significance limit was accepted as $p<0.05$.

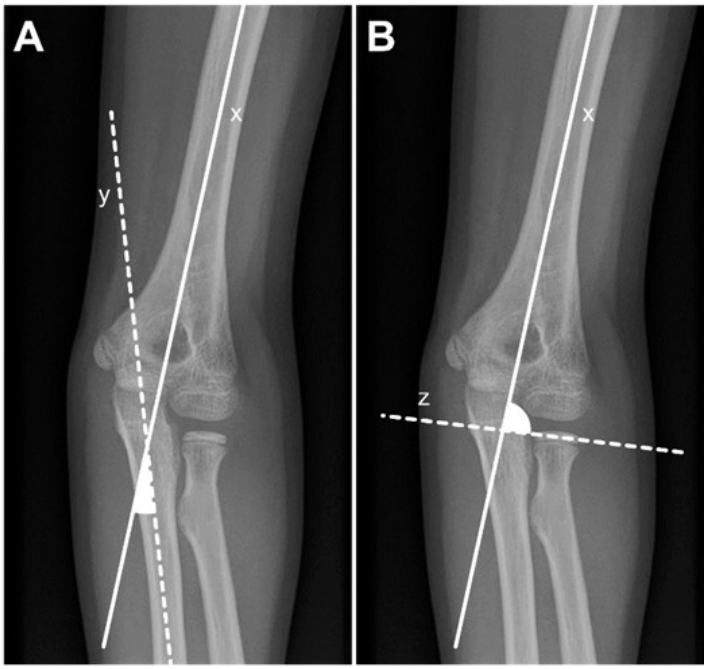

Figure 2. Radial epiphyseal angle and humero-ulnar angle. **A.** Humero-ulnar angle is defined as the angle (scanned area) between the long axes of the humerus (line x) and ulna (line y). **B.** Radial epiphyseal line is defined as the angle at the proximal lateral edge of the point (scanned area) where the first line drawn along the long axis of the humerus (line x) and the second line passing through the radial head epiphysis intersect (line z).

RESULTS

Of the 80 patients evaluated, the mechanism of injury was found to be traction in 27 patients (33.8%), while the pulled elbow was observed in 53 patients (66.3%) after falling. No loss of range of motion was detected in any of the patients. Detailed distribution of the patients can be seen in Table 1.

No missed fractures were detected in any patient in the radiological analysis. The radio-capitellar line was disrupted in 10 patients (12.8%) in the anteroposterior radiographs and 18 patients (23.1%) in lateral radiographs. The median RE and HU angles of the injured side were 92.2° (Range: 81.9-170.8 degrees) and 170.8° (Range: 90-176.3 degrees). No significant difference was found between the injured and intact sides in terms of radiological measurements ($p>0.05$ for each) (Table 2).

Recurrent dislocations were detected in 14 patients (17.5%). No significant relationship was found between recurrent pulled elbow and gender, side, mechanism of injury, and radiological findings ($p>0.05$ for each) (Table 3).

Table 1. Demographic profile of the patients.

		Pulled Elbow (n=80 patients)	
Age		**24.5 months (IR: 21) (Range: 4-71 months)**	
Gender	Male	37	46.3%
	Female	43	53.8%
Side	Right	31	38.8%
	Left	49	61.3%
Injury Mechanism	Traction	27	33.8%
	Fall	53	66.3%
Recurrence	No	66	82.5%
	Yes	14	17.5%
Follow-up		**12.5 months (IR: 11) (Range: 8-32 months)**	
Range of motion at the last follow-up	No limitation	80	100
	Limited	0	0

N: number of patients; IR: interquartile range.

Table 2. Radiographic analysis of pulled elbow.

		Injured Elbow (N= 80 patients)	Intact Elbow (N= 80 patients)	p
Anteroposterior Radio-capitellar Line	Available	70 (87.5%)	N/A	N/A*
	Disrupted	10 (12.5%)		
Lateral Radio-capitellar Line	Available	62 (77.5%)	N/A	N/A*
	Disrupted	18 (22.5%)		
Radial Epiphyseal Angle (degrees)		92.2° (IR: 7.25°) (81.9° - 170.8°)	91° (IR: 7.1°) (80° - 104.2°)	0.580
Humero-ulnar Angle (degrees)		170.8° (IR: 6.45°) (90° - 176.3°)	170° (IR: 6.1°) (160° - 176.4°)	0.406

N: Number of patients; p: Statistical significance value; IR: Interquartile range; *: No statistics were computed because Radio-capitellar line is a constant for intact elbow.

Table 3. Analysis of the Recurrency-related Demographic and Radiological Factors.

		No Recurrency (N=66 patients)	Recurrent Cases (N=14 patients)	p
Age (months)		25.5 (IR: 20) (4 – 71)	20.5 (IR: 14) (7 – 55)	0.121
Gender	Male	30 (81.1%)	7 (18.9%)	0.757
	Female	36 (83.7%)	7 (16.3%)	
Side	Right	26 (83.9%)	5 (16.1%)	0.797
	Left	40 (81.6%)	9 (18.4%)	
Injury Mechanism	Traction	23 (85.2%)	4 (14.8%)	0.763
	Fall	43 (81.1%)	10 (18.9%)	
Anteroposterior Radio-capitellar Line	Available	58 (82.9%)	12 (17.1%)	0.824
	Disrupted	8 (80%)	2 (20%)	
Lateral Radio-capitellar Line	Available	51 (82.3%)	11 (17.7%)	0.916
	Disrupted	15 (83.3%)	3 (16.7%)	
Radial Epiphyseal Angle (degrees)		91° (IR:7°) (81.51° - 170.8°)	94° (IR: 5.77°) (87.3° - 104.2°)	0.075
Humero-ulnar Angle (degrees)		170.8° (IR: 6.8°) (90° - 176.4°)	170.4° (IR: 6.17°) (164.6° - 175°)	0.924

N: Number of patients; p: Statistical significance value; IR: Interquartile range.

DISCUSSION AND CONCLUSION

The necessity of radiological evaluation in the diagnostic process of the pulled elbow is controversial since the diagnosis is usually easily made by sufficient anamnesis and optimal physical examination.[1,13,14] Although the prevailing opinion in the literature is that no additional diagnostic tests are necessary, some studies[13-15] in recent years suggest elbow ultrasonography to assist the diagnostic process. On the other hand, the absence of radiography raises some ethical and medicolegal concerns, such as missed fractures and overlooked child abuse, especially considering the possibility of families' concealment of information. Our study aimed to investi-

gate the diagnostic and prognostic importance of radiographic examination in the pulled elbow and to examine the relationship between radiological findings and recurrence. To the best of our knowledge, there is no large-scale radiological study regarding pulled elbow in the literature, constituting our study's main strength. Our most important finding was that the radio-capitellar line, the radiological indicator of radial head dislocation, was disrupted in only 10 (12%) patients in the anteroposterior plane and only 18 (23.1%) patients in the lateral plane. There was no significant difference between the values of the elbow angles on the injured and intact sides ($p>0.05$ for each). Moreover, no recurrence-related radiological parameter was detected ($p>0.05$ for each).

Approximately one-fourth of childhood injuries involve the elbow area.[16] Although most of them are supracondylar fractures, the pulled elbow should be kept in mind, especially in children under six years of age with a history of sudden traction.[1,2,5,6] As mentioned before, the prevailing view in the literature is that the diagnosis of the pulled elbow should be made clinically, and unnecessary radiation should be avoided. On the other hand, radiographic examinations are also requested in the pulled elbow for reasons such as atypical history and suspected fracture. There are many radiographic measurements described in the literature for pediatric elbow examination.[10-12] Since pulled elbow is a pathology associated with the radial head, in this study, the radio-capitellar line, which is an indicator for radial head dislocation,[11] and radial epiphyseal angle, which is directly related to the radial epiphysis,[12] was examined. In addition, the humero-ulnar angle, which was clinically correlated with the bearing angle,[12] was also evaluated. Unfortunately, we found that the radio-capitellar line was disrupted in the anteroposterior, and lateral planes in very few of our pulled elbow cases. Moreover, no significant difference was detected between the injured and healthy side values of RE and HU angles. In line with the findings of our study, we concluded that radiographic examination is not necessary for the diagnostic process of the pulled elbow. Although it can be interpreted as a dislocation, the fact that the underlying pathology of this clinical picture is ligament-related may explain this situation. Moreover, when the relationship between radiological analyses and recurrent pulled elbow cases was examined, no significant association was found between recurrency and radiological measurements ($p>0.05$ for each). This situation can be interpreted as the radiological examination is not prognostically critical in the pulled elbow. On the other hand, the fact that no significant relationship was found not only between recurrency and radiological analyses but also between recurrency and demographic characteristics and injury mechanisms suggests that recurrency is unpredictable and families should avoid sudden and rapid upper extremity traction.

Considering the pulled elbow occurs with the sudden and rapid traction of the upper extremity pathophysiologically, traction must be present in the anamnesis. On the other hand, contrary to both theoretical knowledge and literature, two-thirds of the patients in our study were injured after falling. We believe the reason behind this contradiction is the involuntary deficiencies of families in explaining the mechanism of injury. Moreover, how a child is lifted off the ground after falling is also important. If someone is lifted from the ground by holding a single upper extremity and pulling it suddenly after a slight fall, the family will give an anamnesis of the fall. Still, pulled elbow will be seen after traction. The crucial point is, regardless of the reason, in a child younger than six years old who applied to the emergency department with anamnesis of falling and complaining of elbow pain, both emergency physicians and general practitioners will order comparative bilateral radiographs to exclude fracture and protect themselves medicolegally. At this point, taking the correct anamnesis from the patient and the family and an effective physical examination may reduce the need for a radiographic examination. Still, medicolegal problems that may arise are a separate topic of discussion.

One of the most important steps in the patient evaluation process for a patient with a pre-diagnosis pulled elbow is to consider child abuse. The child and family should be evaluated carefully, and other accompanying injuries of the child should be examined. In the suspect of abuse, the whole body should be examined in detail for extensive bruises in the body, and fractures at different healing stages on the X-ray should be checked.

There are some limitations in our study. First, the small number of patients, the retrospective nature of the study, and the absence of a control group significantly reduce the power of the study. In addition, the measurement of radiographs taken in the emergency room after an acute scenario is an important limitation. Incorrect positioning regarding acute pain will affect measurements. Finally, apart from the measurements included in the study, many radiographic measurements were defined to evaluate the pediatric elbow. The necessity of radiological analysis can be investigated in more detail with studies conducted with more extensive patient series and including all defined measurements.

In conclusion, although a radiographic examination of the pulled elbow is not diagnostically and prognostically necessary, radiographs of the elbow can be taken and examined in terms of fracture exclusion

and medicolegal concerns. There is no obvious risk factor predicting recurrent dislocation demographically and radiologically, and care should be taken regarding child abuse.

Ethics Committee Approval: Our study was approved by the Clinical Research Ethics Committee of Ankara City Hospital (Date: 23.03.2022, decision no: E1-22-2500). The international Helsinki Declaration of human rights carried out the study.

Conflict of Interest: No conflict of interest was declared by the authors.

Author Contributions: Concept – BG, İSD, NKÜ, MMA, ÖD; Supervision – İSD, ÖD; Materials – İSD, NKÜ, MMA; Data Collection and/or Processing – İSD, NKÜ, MMA; Analysis and/or Interpretation – BG, İSD, NKÜ, MMA, ÖD; Writing – BG, NKÜ, MMA

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Status of Pediatric Oncology Nurses to Achieve Global Standards: The Sample of Türkiye

Pediatrik Onkoloji Hemşirelerinin Küresel Standartlara Ulaşma Durumu: Türkiye Örneklemi

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ABSTRACT

Objective: This study's purpose is to investigate the achievement of baseline standards for pediatric oncology nursing care in Türkiye.

Materials and Methods: The research was carried out with nurse administrators in 41 pediatric oncology clinics between March and May 2022. Data were collected by an 'Information Form' and 'Baseline Standards for Pediatric Oncology Nursing Care'.

Results: Most of the clinics did not meet the first standard related to staffing based on patient acuity. It was found that 80.5% of the clinics that applied formalized education in pediatric oncology clinics, and they met the second standard related to formalized orientation. Most of the clinics (92.7%) had continuing education and training and they met the third standard. Most of the clinics (82.9%) met the fourth standard related to multidisciplinary teamwork. Nearly half of the clinics met the fifth and sixth standards.

Conclusion: It was revealed that there are not many specialist nurses working in the clinics, that the nurse-to-patient ratio is relatively high, and nurses do not receive sufficient financial support for research. Institutions and societies must create strategies that specify pediatric oncology nurses to the achievement of baseline standards.

Keywords: Pediatric oncology, nursing, global standards

ÖZ

Amaç: Bu çalışmanın amacı, Türkiye'de bulunan pediatrik onkoloji kliniklerinde çalışan hemşirelerinin küresel standartlara ulaşma durumunun incelenmektir.

Materyal ve Metot: Araştırma Mart-Mayıs 2022 tarihleri arasında 41 merkezdeki pediatrik onkoloji kliniğindeki sorumlu hemşirelere ulaşılarak gerçekleştirildi. Veriler 'Bilgi Formu' ve 'Pediatrik Onkoloji Hemşireliği Bakımı Temel Standartları' ile toplandı.

Bulgular: Kliniklerin çoğu, hasta başına düşen hemşire sayısı ilgili ilk standardı karşılamadı. Standardize edilmiş eğitimin, kliniklerin %85'inde uygulandığı ve kliniklerin çoğunun formalize oryantasyona ilişkin ikinci standardı karşıladığı saptanmıştır. Kliniklerin çoğu (%92,7) sürekli eğitim ve öğretime sahipti ve üçüncü standardı karşıladılar. Kliniklerin çoğu (%82,9) multidisipliner ekip çalışmasına ilişkin dördüncü standardı karşıladı. Kliniklerin yaklaşık yarısı beşinci ve altıncı standartları karşıladı.

Sonuç: Kliniklerde uzman hemşire sayısının az olduğu, hemşire/hasta oranının göreceli olarak fazla olduğu ve hemşirelerin araştırmalar için yeterli maddi destek almadığı bulundu. Kurumların ve derneklerin pediatrik onkoloji hemşirelerinin küresel standartlara ulaşmasında için stratejiler oluşturması kritik öneme sahiptir.

Anahtar Kelimeler: Pediatrik onkoloji, hemşirelik, küresel standartlar

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INTRODUCTION

Childhood cancers are a heterogeneous group of malignancies consisting of many different diseases with different formation forms, etiologies, treatment methods, and acute and late side effects, and are reported as the second cause of death in children worldwide.[1-3] About 400,000 children are diagnosed with cancer each year,[4] and almost nine out of ten of these children live in low- and middle-income countries (LMICs), where treatment is often unavailable or incredibly expensive.[5, 6] As a consequence, less than 30% of children with cancer survive in LMICs, compared to 80% or higher in high-income countries.[7, 8]

The International Society for Pediatric Oncology (SIOP) was established to prevent children from dying from cancer by improving access to treatment and care in LMICs.[9] SIOP established various strategies and initiatives to improve the priority of childhood cancer promoting increasing awareness at the national and international levels, as well as extending the resources to perform strategies in cancer care.[10] All these strategies aim to provide quality care to children and to remove these inequalities in LMICs.[11] To eliminate these disparities and improve the overall standard of care provided to children, professionals in the healthcare industry play an essential role. Especially pediatric oncology nurses, who are members of a multidisciplinary team, have great responsibilities in this regard.[12] Nurse Working Group was created at the 2011 SIOP congress to increase the quality of care in pediatric oncology nursing.[13] The main purpose of this group is to provide access to effective and safe nursing care in LMICs. In this context, six baseline standards for pediatric oncology nursing care were developed.[9]

To realize these standards, local governments need to support pediatric oncology nurses in the context of orientation programs and continuing education practices.[14,15] Nurses should comply with the standards prepared in line with the guidelines in pediatric oncology patient care.[16]

Within the scope of this information, this study's purpose is to investigate the achievement of baseline standards for pediatric oncology nursing care developed by the Nursing Working Group of the International Society of Pediatric Oncology in Türkiye.

MATERIALS AND METHODS

Ethics Committee Approval: Written permission was obtained from the Social and Human Sciences Research Ethics Committee of Koc University to conduct the study (Date: 24.03.2022, decision no: 2022.113.IR83.057). All nurses invited to the study were informed about the study and written consent was obtained. They were informed that if they wanted to withdraw from the study, they could leave without stating any circumstances. The research was conducted in accordance with the Declaration of Helsinki.

Study Design: This descriptive study purposed to investigate the achievement of baseline standards for pediatric oncology nursing care in Türkiye.

Study Setting: The research will be carried out between February and May 2022 by reaching 62 centers where the treatment and care of pediatric oncology patients in Türkiye are provided.

Data Collection Tools:

Information Form: This form was prepared by the researchers in line with the literature. In the study, a total of 7 questions about the descriptive characteristics of the participants (age, gender, educational status, working time, etc.) and 15 questions about the clinic where the participants worked (number of beds in the clinic, number of nurses working in the clinic, number of specialist nurses, number of pediatric oncologists, etc.) 22 questions were created.[9,17,18]

Baseline Standard Pediatric Oncology Nursing Care: To increase the quality of care in pediatric oncology nursing, the Nursing Working Group was established within the Pediatric Oncology in Developing Countries (PODC) structure.[9, 11] This society comprises nurses from 23 countries as well as partnerships and advocates for nurses who want to improve pediatric oncology care.[9] The main purpose of this group is to provide access to effective and safe nursing care in low and middle-income countries. In this context, six basic global standards for nursing care have been developed.[11] These standards have been converted into a form by the researchers. In a form consisting of six standards: Inpatient Staffing Plans, Orientation Program, Continuing Education, Multidisciplinary, Collaboration, Safety Resources, and Policies and Procedures.

Data Collection Procedure: To reach the administrator nurses of the pediatric oncology clinics in 62 centers by the researchers, the Turkish Oncology Nursing Association, and the Turkish Pediatric Oncology Group were contacted, and the contact addresses of the nurses were reached. Nurses whose contact addresses were reached were informed about the scope and purpose of the research. Nurses who volunteered to participate in the research were asked to complete a 'Survey Form' by sending them via email, WhatsApp, or social media.

Statistical Analysis: The data were analyzed using the IBM SPSS 28 package program. In the analysis of descriptive data, mean, standard deviation, percent, median, and interquartile range were used.

RESULTS

The research was carried out by reaching 41 centers from 62 pediatric oncology clinics in Türkiye and reaching the administrator's nurses of pediatric oncology clinics.

The mean age of the pediatric oncology nurses was 36.12 ± 8.94, 95.1% of the female, 29.3% of them have 1-2 years of working experience in pediatric oncology, and %46.3 of them have 1-2 years of working experience as administrators of pediatric oncology. More of the nurses had bachelor's degrees and 24.4% of them had a specialty in pediatric oncology nursing (Table 1).

Table 1. Descriptive characteristics of administrators of the Pediatric Oncology Nurses.

Variables		Statistical Analysis
Age (Mean ± SD)		36.12 ± 8.94
Gender (year) n (%)	Female	39 (95.1)
	Male	2 (4.9)
Working experiences in pediatric oncology (year n (%))	1-2 years	12 (29.3)
	3-5 years	5 (12.2)
	6-10 years	11 (26.8)
	>10 years	13 (31.7)
Working experiences as administrators of pediatric oncology (year n (%))	1-2 years	19 (46.3)
	3-5 years	3 (7.3)
	6-10 years	11 (26.8)
	>10 years	8 (19.5)
Education n (%)	High school	4 (9.7)
	Bachelor	26 (63.4)
	Graduated	11 (26.8)
Having a specialty in Pediatric Oncology Nursing n (%)	Yes	10 (24.4)
	No	31 (75.6)

The average number of beds in the pediatric oncology clinics was 21.85± 12.28, the number of nurses working in the clinics was 13.87±5.88, and the number of specialist nurses was 0.95±2.38. More of the clinics were in the university hospital (65.9%), 24.4% of the clinics had specialist nurses, most of the clinics had a specialist pediatric oncology physician (87.8%), 58.5% of them had a specialist psychologist, 48.8% of them had a specialist pharmacist, 36.6% of them had a social worker, 22% of them an occupational therapist, 61% of them had a hospital teacher, 87.8% of them had a medical secretary, 65.9% of them had a nutritionist, 24.4%of the had a day room for parents, 73.2% of them had kitchen/laundry room for parents and 70.7% of them had a playroom for children (Table 2).

Table 2. Descriptive characteristics of pediatric oncology clinic.

Variables		Statistical Analysis
Number of beds (Mean ± SD)		21.85± 12.28
Number of nurses (Mean ± SD)		13.87±5.88
Number of specialist nurses (Mean ± SD)		0.95±2.38
Type of institution n (%)	State Hospital	9 (22.0)
	University Hospital	27 (65.9)
	Foundation Hospital	5 (12.2)
Having a specialist pediatric oncology nurse n (%)	Yes	10 (24.4)
	No	31 (75.6)
Having a specialist pediatric oncology physician n (%)	Yes	36 (87.8)
	No	5 (12.2)
Having a specialist psychologist n (%)	Yes	24 (58.5)
	No	17 (41.5)
Having a specialist pharmacist n (%)	Yes	20 (48.8)
	No	21 (51.2)
Having a social worker n (%)	Yes	15 (36.6)
	No	26 (63.4)
Having an occupational therapist n (%)	Yes	9 (22.0)
	No	32 (78.0)

Table 2. Continue.

Having a hospital teacher n (%)	Yes	25 (61.0)
	No	16 (39.0)
Having a medical secretary n (%)	Yes	36 (87.8)
	No	5 (12.2)
Having a nutritionist n (%)	Yes	27 (65.9)
	No	14 (34.1)
Having day room for parents n (%)	Yes	10 (24.4)
	No	31 (75.6)
Having kitchen/laundry room for parents n (%)	Yes	30 (73.2)
	No	11 (26.8)
Having a playroom for children n (%)	Yes	29 (70.7)
	No	12 (29.3)

The first standard related to staffing is based on patient acuity. The nurse-to-patient ratio in clinics was 6.80±1.89, and it was determined that 31.7% of the centers reached this standard. The nurse-to-patient ratio in the intensive care unit and bone marrow transplant units was 2.97±1.35 and 22% of the clinics met this standard. 24.4% of the clinics had nurses who were experts in the field of oncology and 12.2% of them met the first standard that specialist nurses should not be included in rotations. Unfortunately, most of the clinics did not meet the first standard. The second standard is related to formalized orientation. It was found that 80.5% of the clinics applied a formalized pediatric oncology orientation program for new nurses and the duration of orientation was 10.04±11.46 weeks. It was determined that most of the clinics met the second standard according to the topics to be included in the orientation program. The third standard related to continuing education and most of the clinics (92.7%) had continuing education and training to increase pediatric oncology clinical skills and knowledge, more of them (78.0%) had a least ten hours of continuing education each year and the duration of annual training was 14.26±13.94 hours. Most of the clinics met the third standard. The fourth standard is related to multidisciplinary teamwork. In most of the clinics (82.9%), a nurse participated in patient visits as well as all discussions with patients as well as parents or other caregivers about treatment plans and diagnosis plans. Most of the clinics met the fourth standard. The fifth standard is related to resources for safe care. 58.5% of the clinics had available resources for safe pediatric oncology care, 68.3% of the included intravenous pumps and hand-washing facilities, and 43.9% of them would only prepare chemotherapeutic agents in the lack of a pharmacist and the presence of suitable personal protective equipment. Unfortunately, nearly half of the clinics met the fifth standard. The sixth standard is related to evidence-based practice. 63.4 % of pediatric oncology nursing practices and policies are now evidence-based, and 26.8 % of nursing research projects that aim to enhance nursing policies and practices have received financial support. Unfortunately, most of the clinics did not meet the sixth standard (Table 3).

Table 3. Global pediatric oncology nursing standards.

Variables		**Available**	**Not Available**
Standard 1: **Staffing based on patient acuity**	A nurse-to-patient ratio of 1:5 for pediatric oncology units n (%)	13 (31.7)	28 (68.3)
	The number of patients per nurse in your clinic (Mean ± SD)	6.80±1.89	
	1:2 for critical care and bone marrow transplant units n (%)	9 (22.0)	32 (78.0)
	The number of patients per nurse in your clinic (Mean ± SD)	2.97±1.35	
	Clinics should have nurses who are experts in the field of oncology. n (%)	10 (24.4)	31 (75.6)
	Specialist nurses should not be included in rotations n (%)	5 (12.2)	36 (87.8)

Table 3. Continue.

Standard 2: Formalized orientation	A formalized pediatric oncology orientation program for new nurses n (%)	33 (80.5)	8 (19.5)
	The program should define specific learning objectives and include training in both theory and clinical skills, followed by 3–4 weeks of working with a skilled nurse n (%)	34 (82.9)	7 (17.1)
	A minimum of 2 weeks of theory/skills training in key topic areas and 3-4 weeks of clinical observation are required n (%)	31 (75.6)	10 (24.4)
	Orientation time in the clinic (Mean ± SD)	10.04± 11.46	
Topics to be included in the orientation program	New nurses should successfully complete orientation before providing unsupervised patient care n (%)	36 (87.8)	5 (12.2)
	An overview of pediatric cancers n (%)	29 (70.7)	12 (29.2)
	Safe administration of chemotherapy and high-alert medication n (%)	39 (95.1)	2 (4.9)
	Infection control and prevention n (%)	40 (97.6)	1 (2.4)
	Patient and family education n (%)	37 (90.2)	4 (9.8)
	Palliative care, and early detection and management of oncology emergencies n (%)	34 (82.9)	7 (17.1)
Standard 3: Continuing education	Continuing education and training to increase pediatric oncology clinical skills and knowledge n (%)	38 (92.7)	3 (7.3)
	A minimum of 10 hours a year is recommended n (%)	32 (78.0)	9 (22.0)
	Annual training hours in the clinic (Mean ± SD)	14.26±13.94	
Standard 4: Multidisciplinary teamwork	A nurse should be included in patient rounds and all meetings with patients and parents/caregivers regarding diagnosis and treatment plans n (%)	34 (82.9)	7 (17.1)
Standard 5: Resources for safe care	Available resources for safe pediatric oncology care n (%)	24 (58.5)	17 (41.5)
	These include intravenous pumps and hand-washing facilities n (%)	28 (68.3)	13 (31.7)
	Nurses should prepare chemotherapy drugs only if a pharmacist is not available and when provided with appropriate personal protective equipment n (%)	18 (43.9)	23 (56.1)
Standard 6: Evidence-based practice	Evidence-based pediatric oncology nursing policies and procedures to guide the delivery of quality nursing care n (%)	26 (63.4)	15 (36.6)
	Should be funded for locally directed research to develop relevant nursing policies and procedures in low- and middle-income countries n (%)	11 (26.8)	30 (73.2)

DISCUSSION AND CONCLUSION

Pediatric oncology nurses, regardless of where they work, may help to reduce disparities, and improve outcomes for children and adolescents with cancer by providing specialized nursing care, patient and family education, research, and advocacy.[10] It is critical to build and expand a sustainable network strategy for pediatric oncology nursing.[12] In this study, it is aimed to investigate the achievement of baseline standards for pediatric oncology nursing care in Türkiye. It was revealed that most of the clinics (more than 80%) reached the second standard related to formalized orientation, the third standard related to continuing education, and the fourth standard related to multidisciplinary teamwork. Unfortunately, more of the clinics could not reach the first standard related to staffing based on patient acuity, the fifth standard related to resources for safe care, and the sixth standard related to evidence-based practice.

Childhood cancers and their treatments are quite complex. Many professionals are realizing that high-quality specialist nursing care and nursing involvement in clinical decision-making is critical to improving the survival rate of pediatric oncology patients in low- and middle-income countries.[17, 18] For this, the nurses who will be providing care for pediatric oncology patients need to have a specialty in this area and the skills necessary to offer care for these individuals. Because of our research, we determined that the number of specialist nurses in most Turkish clinics is fairly low (24.4%). In addition, the nurse-to-patient ratio is slightly higher than the global standard. It is expected that the quality of life of children who receive care from an active and expert nurse will increase with the increase in the quality of care. Therefore, it is critical that nurses who care for pediatric oncology patients, who are vulnerable pop-

ulations, specialize in and support this.

The fifth standard is related to resources for safe care. Unfortunately, nearly half of the clinics met the fifth standard, and the appropriate personal protective equipment is limited for safe care. 2016 Updated American Society of Clinical Oncology/ Oncology Nursing Society Chemotherapy Administration Safety Standards recommend that chemotherapy drugs are prepared by the pharmacist.[19] In this study, pharmacists prepare chemotherapy drugs in 43.9% of clinics. Similarly, Morrissey et al.,[20] reported that nurses at L/LMIC report they prepare chemotherapy more frequently and have less access to personal protective equipment, such as nitrile gloves and liquid-resistant gowns, than nurses in high-resource environments. In the study of Sullivan et al.[21] in 54 countries, 16.8% of countries did not meet the fifth standard related to resources for safe care and 32.7% of them partially met it. Safety standards can serve as the foundation for best practices, which are evidence-based processes that help ensure safe care and treatment within a strong culture of safety and quality.

Pediatric oncology nursing research in the last 50 years has produced evidence to support best practices in nursing care.[22] In this context, it is so important to support pediatric oncology nurses' research and allow them to implement evidence-based practice in clinics. According to our findings, a small percentage of pediatric oncology nurses (26.8%) did not get funds for their study, whereas 63.4% embraced evidence-based pediatric oncology nursing policies and practices. The literature supports our study findings. A study by Mezgebu et al.,[22] evaluated the status of pediatric oncology nursing research in three low- and middle-income countries, and it was concluded that lack of training, mentors, funding, and opportunities were challenges for nurses to conduct research. It was stated that nursing research education, financing, and protected time are three essential factors in guiding and motivating staff and academic nurses to engage in research that improves the treatment of children and adolescents with cancer in all countries[22]. In this direction, it is very important to provide advanced nurse training, specialization, support of hospital management, financing, and time opportunities for pediatric oncology nurses to perform evidence-based practices and research.

In conclusion, the Safe delivery of nursing care to pediatric oncology patients is an important component of quality care. Despite these limitations, our results show that nurses most of the pediatric oncology clinics have nursing orientation programs, carry out continued education/ training, and have a multidisciplinary teamwork approach. Unfortunately, more of the clinics could not reach the nurse-to-patient ratio; they lack equipment for safe care, implementing evidence-based practice, and financial support for conducting research. Low- and middle-income countries confront significant challenges in caring for children with cancer and their families, give information that was previously lacking in the literature, and suggest possibilities for future study.

Ethics Committee Approval: Written permission was obtained from the Social and Human Sciences Research Ethics Committee of Koc University to conduct the study (Date: 24.03.2022, decision no: 2022.113.IR83.057). All nurses invited to the study were informed about the study. They were informed that if they wanted to withdraw from the study, they could leave without stating any circumstances. The research was conducted in accordance with the Declaration of Helsinki.

Conflict of Interest: No conflict of interest was declared by the authors.

Author Contributions: Concept – RS, PY; Supervision – RS, PY; Materials – RS, PY; Data Collection and/or Processing – RS, PY; Analysis and/or Interpretation – RS, PY; Writing – RS, PY

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Mental Health Literacy in Individuals Diagnosed with Diabetes

Diyabet Tanısı Alan Bireylerde Ruh Sağlığı Okuryazarlığı

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ABSTRACT

Objective: This study was conducted to determine the mental health literacy levels of individuals diagnosed with diabetes and the factors affecting this level.

Materials and Methods: The study was conducted with 211 people who applied to the diabetes outpatient clinic of a training and research hospital between June and August 2022 and were previously diagnosed with diabetes. "Personal Information Form" and "Mental Health Literacy Scale" were used for data.

Results: In the study, the knowledge-based literacy sub-dimension mean score of individuals diagnosed with diabetes was 6.53±2.67, the belief-based literacy sub-dimension mean score was 3.62±1.95, the resource-oriented literacy sub-dimension mean score was 1.54±1.41 and The mean MHLS total score was 11.68±4.33. The patients' age, education level, marital status, perceived income status, and the time elapsed since the diagnosis changed their mental health literacy levels ($p<0.05$).

Conclusion: This study observed that the patient's mental health literacy levels were above the average score. Making it easier for patients to adapt to treatment may also contribute to minimizing the mental health problems experienced by patients. In order to improve the mental health literacy levels of individuals diagnosed with diabetes, it is recommended to conduct awareness-raising training programs.

Keywords: Diabetes, mental health, mental health literacy

ÖZ

Amaç: Bu çalışma diyabet tanısı alan bireylerin ruh sağlığı okuryazarlığı düzeylerini ve bu düzeyi etkileyen faktörleri belirlemek amacıyla yapılmıştır.

Materyal ve Metot: Araştırma Haziran-Ağustos 2022 tarihleri arasında bir eğitim araştırma hastanesinin diyabet polikliniğine başvuran ve daha önce diyabet tanısı almış 211 kişiyle yürütülmüştür. Veriler için "Kişisel Bilgi Formu" ve "Ruh Sağlığı Okuryazarlığı Ölçeği" kullanılmıştır.

Bulgular: Araştırmada diyabet tanısı alan bireylerin "Bilgi Odaklı Okuryazarlık" alt boyut puan ortalamasının 6,53±2,67, "İnanç Odaklı Okuryazarlık" alt boyutu puan ortalamasının 3,62±1,95, "Kaynak Odaklı Okuryazarlık" alt boyutu puan ortalamasının 1,54±1,41 ve MHLS toplam puan ortalamasının 11,68±4,33 olduğu görülmüştür. Hastaların yaş, eğitim durumu, medeni durum, algıladıkları gelir durumu, tanı aldıklarından bu yana geçen süreye ruh sağlığı okuryazarlık düzeyleri değişmektedir ($p<0,05$).

Sonuç: Bu çalışmada diyabet tanısı alan bireylerin ruh sağlığı okuryazarlık düzeylerinin orta değerin üzerinde olduğu görülmüştür. Hastaların tedaviye uyumlarının kolay hale gelmesi, hastaların yaşadıkları ruh sağlığı sorunlarının da en aza indirilmesine katkı sağlayabilir. Diyabet tanısı alan bireylerin ruh sağlığı okuryazarlığı düzeylerinin geliştirilmesi için farkındalık artırmaya yönelik eğitim programlarının yapılması önerilmektedir.

Anahtar Kelimeler: Diyabet, ruh sağlığı, ruh sağlığı okur-yazarlığı

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INTRODUCTION

The increase in sedentary lifestyles in recent years has paved the way for an increase in health problems. Health problems arising from a sedentary lifestyle not only threaten the general health of people, but also increase the health expenditures of countries.[1] Diabetes arises due to a sedentary lifestyle,[2] Diabetes; It is a metabolic and endocrine system disease in which chronic hypoglycemia is seen, which occurs due to the absence or insufficiency of insulin hormone, and causes some disorders in protein, fat and carbohydrate metabolism.[3] It is stated that the prevalence of diabetes is increasing. It t is seen that diabetes can adversely affect mental health as in other chronic diseases. In the studies in the literature, it is emphasized that diabetes affects the psychological structure negatively and paves the way for the deterioration of mental health.[4-5]

It is known that one of the most important elements of preventive mental health services is to increase the mental health literacy level of individuals. There is a positive relationship between individuals' help-seeking behavior and mental health literacy.[6] It is expected that the mental health literacy levels of diabetic patients should be developed so that they are affected by the mental health problems they encounter as low as possible. When considered conceptually, mental health literacy; It is defined as "*social and cognitive skills that determine the power of people to access, understand and use information about health*".[7] Although there are studies examining health literacy in diabetes patients in the literature,[8-9] it is seen that studies addressing mental health literacy in diabetes patients are limited.[10]

This study was conducted to determine the mental health literacy levels of diabetic patients and the factors affecting this level.

MATERIALS AND METHODS

***Research and Publication Ethics*:** Ethics committee permission was obtained from the University of Health Sciences, Training and Research Hospital Clinical Research Ethics Committee, Ankara-Türkiye (Date:18/05/2022, decision no: E-22-991) and also institutional permissions (Date: 19.04.2022) were obtained for the implementation of the study. Permission to use the MHLS Scale, which is one of the data collection tools, was obtained from the authors who conducted the Turkish validity and reliability study. The purpose of the study was explained to the participants and their voluntary consent was obtained. The study was conducted in accordance with the Declaration of Helsinki.

***Process**:* This study is of a cross-sectional type and was conducted in the diabetes outpatient clinic of a training and research hospital between June and August 2022. The population of the study consisted of patients who applied to the diabetes polyclinic of a training and research hospital between June and August 2022. In the study, it was aimed to reach all patients who met the criteria for inclusion in the study between June and August 2022 without choosing a sample. Inclusion criteria for the study; being followed up with a diagnosis of diabetes in the diabetes outpatient clinic, being between the ages of 18 -65, not being diagnosed with diabetes for the first time, not having a health problem that would prevent reading, understanding and answering the questions in the data collection tools, and agreeing to participate in the research. Accordingly, the sample of the study consisted of 211 outpatients followed in the diabetes outpatient clinic.

***Data Collection Tools*:** In the process of collecting the research data, the "Personal Information Form" and "Mental Health Literacy Scale (MHLS)" created by the researchers were used.

Personal Information Form: Includes data on age, gender, marital status, monthly income level, and the number of years treated.

Mental Health Literacy Scale (MHLS): Turkish validity and reliability study Göktaş et al. consists of 22 items. The MHLS Scale has three sub-dimensions: knowledge-based literacy, belief-based literacy, and resource-oriented literacy. The score that can be obtained from the scale varies between 0 -22. It is accepted that the higher the score in each sub-domain, the higher the MHLS level. The Cronbach's alpha coefficient of the scale was found to be 0.71.[7] In this study, the Cronbach's alpha coefficient of the scale was determined as 0.79.

***Data Collection*:** Ethics committee permission and institutional permission were obtained from the institution where the research would be conducted before starting the research. Before the data collection tools were applied, the participants were informed about the research and their consent was obtained. Data collection tools were applied face-to-face to the participants and took approximately 7-10 minutes.

***Statistical Analysis*:** Comparative analyzes were used in the SPSS 25.0 program in the data analysis process of the research, and the level of compliance of the data with the normal distribution was tested with the Kolmogorov Smirnov test in the first stage of the data analysis process (Table 1). When the K-S test results are examined, it is seen that the data are not suitable for normal distribution ($p<0.05$). Percentage, min-max, standard deviation and interquartile range were used to evaluate the data. Non-parametric analyzes were used because the data were not normally distributed. The Kruskal Wallis H test was used to compare the scale scores according to the variables of age, education level, marital sta-

Table 1. Reliability Analysis of MHLS Scale Scores and One Sample Kolmogorov-Smirnov (K-S) Normality Analysis.

Scale-Subsclae	Cronbach's Alpha (a)	K-S (p)
Knowledge Based	0.799	0.000
Belief Based	0.649	0.000
Resourse Oriented	0.729	0.000
Total Score	0.794	0.004

tus, perceived income status, and time since diagnosis, and Mann Whitney U analysis was used for the gender variable comparison. The statistical significance level was determined as 0.05.

RESULTS

It was observed that 36.5% of the participants were between the ages of 50-59 and 58.8% were women. It has been determined that 46% of them are primary school graduates, 81.5% are married, and 44.1% of them have income equal to their expenses. In addition, when the duration of the participants since their diagnosis is examined, it is seen that 49.3% of them are between 1-5 years (Table 2).

The knowledge-oriented literacy level mean score of the participants was 6.53±2.67; The mean score of belief-based literacy level was 3.62±1.95 and the mean score of resource-oriented literacy level was 1.54±1.41; It is seen that the mean total score of the MHLS scale is 11.68±4.33 (Table 3).

The knowledge and resource-oriented literacy levels of the participants aged 59 and over were lower than the others ($p<0.05$), the information and resource-oriented literacy levels of the participants in the 30-39 age group were significantly higher than the participants in the 50-59 age group level was found to be higher ($p<0.05$). It was determined that the mental health literacy level of the participants in the 20-29 age group, 30-39 age group, 40-49 age group and 50-59 age group was higher than the participants aged 59 and over ($p<0.05$) (Table 4).

It was found that the knowledge-based, resource-oriented and total literacy levels of the participants who graduated from primary, high school, university and above were significantly higher than the illiterate participants ($p<0.05$); The knowledge based, resource-oriented and total literacy levels of the participants who graduated from high school and university or higher were significantly higher than the participants who graduated from primary education

Table 2. Frequency and percentage distribution of the Demographic Information of the participants.

Variable	Sub variable	n (%)
Age	20-29	9(4.2)
	30-39	24(11.4)
	40-49	39(18.5)
	50-59	77(36.5)
	59-65	62(29.4)
Gender	Male	87(41.2)
	Female	124(58.8)
Status of education	Illiterate	34(16.1)
	Primary education	97(46.0)
	High school	48(22.7)
	University and above	32(15.2)
Marital status	Married	172(81.5)
	Single	20(9.5)
	Widow	19(9.0)
Perceived income status	Income less than expenses	89(42.2)
	Income more than expenses	29(13.7)
	Income equals expense	93(44.1)
Time since diagnosis	1-5 year	104(49.3)
	6-10 year	41(19.4)
	11-15 year	30(14.2)
	15+ year	36(17.1)

Table 3. Descriptive statistics on the MHLS Scale Scores of the participants.

Subscale	n	Min-Max.	IQR**	Mean±SD
Knowledge Based	211	0-10	7	6.53±2.67
Belief Based	211	0-8	4	3.62±1.95
Resourse Oriented	211	0-5	1	1.54±1.41
Total Score	211	1-20	20	11.68±4.33

*IQR: interquartil range; **SD: standard deviation.

(p<0.05); In addition, it was found that the knowledge based, resource-oriented and total literacy levels of the participants who graduated from university or higher were significantly higher than the participants who graduated from high school (p<0.05) (Table 4). The knowledge-based literacy levels of the single participants were significantly higher than the married participants (p<0.05); resource-oriented and total literacy levels were found to be significantly higher than the married or widowed participants (p<0.05). It was found that the belief-based literacy levels of the participants whose income was equivalent to their expenses were higher than those whose income was less than their expenses (p<0.05). It has been determined that the resource-oriented and total literacy levels of the participants whose income is more than their expenses or whose income is equal to their expenses are significantly higher than those whose income is less than their expenses (p<0.05). On the other hand, the median scores of the knowledge-based and total literacy levels of the participants whose time elapsed between 1-5 years since the diagnosis of the disease were higher than the participants who were between 11-15 years (p<0.05). It was found that the resource-oriented literacy levels of the participants who have passed 1-5 years after the diagnosis of the disease are significantly higher than those of the participants who have passed 11-15 years or 15+ years (p<0.05); It is seen that the literacy levels of the participants who have passed 6-10 years are significantly higher than the participants who have passed 11-15 years after the diagnosis of the disease (p<0.05) (Table 4).

Table 4. MHLS total score and subscale scores according to the personal information of the participants.

Variables		MHLS Total Score		Knowledge Based Subscale Total Score		Belief Based Subscale Total Score		Resource Oriented Subscale Total Score	
		Min-Max	**IQR***	**Min-Max**	**IQR***	**Min-Max**	**IQR***	**Min-Max**	**IQR***
Age	20-29	9-19	15	5-10	9	0-6	4	0-4	2
	30-39	6-20	14	1-10	9	0-6	3.5	0-4	2.5
	40-49	4-20	13	1-10	9	0-7	4	0-4	2
	50-59	2-20	12	2-10	7	2-10	4	0-5	1
	59+	1-19	9.5	0-10	5	0-8	4	0-4	0
		X^2=20.1 **p= 0.001**		X^2=25.4 **p= 0.001**		X^2=3.7 p= 0.443		X^2=32.6 **p= 0.001**	
Gender	Male	1-20	12	0-10	6	0-7	4	0-4	1
	Female	4-20	12	1-10	4	0-8	4	0-5	1
		X^2=5281.0 p= 0.795		X^2=4841.0 p= 0.202		X^2=5098.0 p= 0.492		X^2=5315.0 p= 0.852	
Status of education	Illiterate	3-17	7	0-10	4	0-8	4	0-3	0
	Primary education	1-20	11	1-10	6	0-7	4	0-5	1
	High school	6-20	13	3-10	7	0-6	4	0-4	2
	University and above	8-20	15	5-10	5	0-7	5	1-4	3
		X^2=59.7 **p= 0.001**		X^2=48.6 **p= 0.001**		X^2=6.2 p= 0.102		X^2=67.6 **p= 0.001**	
Marital status	Married	1-20	11.5	**0-10**	**7**	0-8	4	0-5	1
	Single	5-19	16	3-10	8.5	0-6	4.5	0-4	2.5
	Widow	4-18	13	2-10	6	0-6	4	0-4	1
		X^2=11.4 **p= 0.003**		X^2=7.3 **p= 0.026**		X^2=3.00 p= 0.221		X^2=11.6 **p= 0.003**	
Perceived income status	Income less than expenses	1-19	10	0-10	7	0-6	3	0-4	1
	Income more than expenses	5-20	13	2-10	7	0-7	4	0-4	2
	Income equals expense	2-20	13	1-10	7	0-8	4	0-5	1
		X^2=17.2 **p= 0.001**		X^2=4.8 p= 0.089		X^2=12.5 **p= 0.002**		X^2=19.7 **p= 0.001**	
Time since diagnosis	1-5 year	1-20	13	1-10	7	0-7	4	0-4	1
	6-10 year	4-20	12	1-10	7	0-7	4	0-4	1
	11-15 year	2-16	10	1-10	5	0-8	3	0-4	0
	15+ year	4-20	10	0-10	6.5	0-7	4	0-5	1
		X^2=9.6 **p= 0.022**		X^2=10.7 **p= 0.014**		X^2=1.0 p= 0.791		X^2=13.2 **p= 0.004**	

*IQR: Interquartil range.

DISCUSSION AND CONCLUSION

This study was conducted to evaluate the mental health literacy level of individuals with diabetes. Emotional reactions and adjustment difficulties are among the most common problems in these patients.[11] Psychological factors also play an important role in maintaining healthy glycemic control.[12] Although the mental health literacy levels of the diabetic patients participating in the study were not very high, it was observed that they were above the medium score. When the sub-dimension scores of the MHLS Scale were examined, it was determined that the knowledge-based literacy levels of diabetes patients were above the medium score, while the belief-based and resource-oriented literacy levels were below the medium score. Guner et al. in a study examining health literacy in individuals with diabetes; it has been stated that the health literacy of the patients is at a low level.[8] Evaluation of mental health literacy may be useful in planning initiatives to improve community mental health.[13] Increasing mental health literacy can encourage people to realize the mental problems they experience, seek help and get support from a health professional when necessary.[14] As it is known, individuals with a mental disorder may be seen by the society as dangerous, to be avoided, and unpredictable, and this may cause them to stay away from society due to their stigma.[15] It is known that individuals with mental disorders due to fear and anxiety of stigma avoid seeking psychiatric help and this situation affects their mental health more negatively[16.]

Kavak and Aktürk examined the effect of disease perception on anxiety and depression in diabetic patients. In the study, it was stated that 32% of the diabetic patients scored above the threshold in the anxiety sub-dimension and 49% in the depression sub-dimension, and these patients' perceptions of the disease were negative.[17] Karimpour Vazifehkhorani et al. stated that psychoeducation applied to diabetic patients was effective in increasing the level of mental health literacy and adaptation to the disease.[10] Considering that diabetes is a chronic disease; It is thought that increasing the mental health literacy of these individuals will contribute to the prevention of the development of mental disorders by positively affecting their mental health. It was observed that the knowledge-based and resource-oriented literacy sub-dimensions and total MHLS levels of the participants aged 59 years and over were lower than the participants in the other age groups. Knowledge-based literacy includes information about mental health, and resource-based literacy includes questions about the resources that can be accessed for mental health services and support.[7] This result suggests that individuals aged 59 and over may be more disadvantaged in accessing information compared to the younger group. Today, accessing information has become easier and faster with technology. However, age is also an important factor in using technology effectively. An important factor in this regard is thought to be the level of education. It was observed that as the education level of the diabetes patients participating in the study increased, the MHLS levels and the levels of knowledge-based and resource-oriented literacy sub-dimensions increased. In the study of Öztaş and Aydoğan, MHLS-Scale total score averages, knowledge-based subscale mean scores, and belief-based subscale mean scores of health professionals with undergraduate, master's and doctorate degrees were found to be higher than those of high school graduate health professionals.[18] Among the single participants, MHLS levels and knowledge-based and resource-oriented literacy levels were found to be higher than those of married and widowed participants. Studies examining the level of mental health literacy in diabetic patients are limited.[10] On the other hand, in Öz's study in which he examined mental health literacy among individuals living in a city centre, it was observed that the mental health literacy levels of the participants did not change according to their marital status.[19] It can be thought that single individuals may have relatively less responsibilities than those who are married or widowed. Thus, they can have more time to take initiative to improve themselves and increase their level of knowledge.

It has been determined that diabetes patients with low perceived income levels have lower MHLS levels and resource-oriented literacy levels compared to others. In the study of Güner et al., in which they examined health literacy and rational drug use in individuals with diabetes, it was stated that the health literacy levels of the participants with higher income levels were higher.[19] This finding is similar to our results.

In the study, it was observed that the participants whose time elapsed since the diagnosis of diabetes were low had higher MHLS levels, knowledge-based and resource-oriented literacy levels. In the study conducted by Güner et al. on individuals with diabetes, it was stated that the health literacy of participants with a diagnosis period of 5 years or less was higher than those with a longer diagnosis period.[8] This suggests that newly diagnosed individuals should read more on this subject in order to learn about the disease, prognosis, treatment options, and effects on mental health.

The results of this study can only be generalized to this sample group. Among the limitations of the study is the fact that the participants in the study were not evaluated for having an additional disease.

In conclusion, the mental health literacy levels of individuals diagnosed with diabetes and the effects

of this level were evaluated. It is striking that studies in the literature generally examine health literacy in diabetes patients, and studies on mental health literacy in diabetes patients are limited. In this study, it was observed that the mental health literacy levels of individuals diagnosed with diabetes were above the medium score. Studies in this area have indicated that health literacy can positively affect the symptoms of the disease and that patients' adherence to treatment can be facilitated. Facilitating the compliance of the patients with the treatment can minimize the mental health problems they experience; Improving mental health literacy levels will also contribute to the reduction of mental health problems that occur during the disease process or to seek appropriate help in a short time. In order to improve the mental health literacy levels of individuals diagnosed with diabetes, it is recommended to conduct awareness-raising training programs.

Ethics Committee Approval: The study was approved by the Ethics Committee permission was obtained from the University of Health Sciences Training and Research Hospital Clinical Research Ethics Committee, Ankara-Türkiye (Date:18/05/2022, decision no: E-22-991). And institutional permissions (Date: 19.04.2022) were obtained. In line with the Helsinki Declaration, the participants were informed about the study, and their informed consent was obtained. After obtaining consent from the participant who volunteered to participate in the study, they were included in the study.

Conflict of Interest: No conflict of interest was declared by the authors.

Author Contributions: Concept – GS; Supervision- GS; Materials – EU; Data Collection and/or Processing- GS, EU; Analysis and/or Interpretation –GS; Writing – GS, EU.

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Prevalence of Smoking, Alcohol and Substance Use Between High School Students in Yeşilyurt and Battalgazi District of Malatya Province and Influencing Factors

Malatya İli Yeşilyurt ve Battalgazi İlçelerinde Lise Öğrencileri Arasında Sigara, Alkol ve Madde Kullanımı Sıklığı ve Etkileyen Faktörler

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ABSTRACT

Objective: This study aimed to examine the prevalence of smoking, alcohol, and substance use among high school students and the factors that cause them to use them.

Materials and Methods: 42629 high school students are included in this descriptive study. Considering the smoking prevalence is 25.0%, the sample size is 846. A questionnaire was conducted with 975 persons in nine high schools, which had been selected through a stratified sampling method. The chi-square test and the logistical regression analysis are used to assess the statistical analysis.

Results: It was found that the smoking prevalence of the students who participated in this study was 34.0%, while drinking alcohol rate was 14.3%, and use of substances was 4.2%. The smoking rate of male students was 2.2 times more than that of the female students, while use of alcohol by the male students was 7.6 times higher if they smoked. Drinking alcohol rises by 9.6 times compared with those who smoke, while it increases to 26.8 times if the family members drink it ($p<0.05$).

Conclusions: The rate of smoking, drinking alcohol, and substance use among high school students is relatively high. For this reason, students should be informed about harmful habits.

Keywords: Adolescent alcohol use, cigarette smoking, students, substance abuse

ÖZ

Amaç: Bu çalışmada lise öğrencileri arasında sigara, alkol ve madde kullanımı sıklığı ve etkileyen faktörleri incelemek amaçlanmıştır.

Materyal ve Metot: Kesitsel tipte yapılan bu çalışmaya, 42629 lise öğrencisi dahil edilmiştir. Sigara içme prevalansı %25,0 olarak kabul edildiğinde; örneklem büyüklüğü 846 olarak hesaplanmıştır. Tabakalı örnekleme yöntemi ile seçilen 9 ayrı lisede toplam 975 kişi üzerinde anket yapılmıştır. İstatistiksel analizlerde Ki-kare testi ve Lojistik Regresyon analiz testleri kullanılmıştır.

Bulgular: Araştırmaya katılan öğrencilerin sigara kullanma prevelansı %34,0, alkol kullanma prevelansı %14,3 ve madde kullanma prevelansı %4,2 bulunmuştur. Sigara kullanımı; erkek öğrencilerde 2,2 kat, alkol kullananlarda 7,6 kat daha yüksektir ($p<0,05$). Alkol kullanımı; sigara kullananlarda 9,6 kat, ailede alkol kullanımı var ise 26,8 kat artmaktadır ($p<0,05$).

Sonuç: Sigara, alkol ve madde kullanımı lise öğrencilerinde oldukça yüksektir. Bu nedenle öğrencilere zararlı alışkanlıklar hakkında bilgilendirilmelidir.

Anahtar Kelimeler: Alkol içme, madde kullanımı, öğrenciler, sigara içmek

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INTRODUCTION

Tobacco and tobacco products are the primary cause of preventable diseases, disabilities, and death. Therefore, Centres for Disease Control and Prevention (CDC) encourages interference to prevent the youth from using tobacco products during their adolescence or to help those who already use it to quit smoking.[1] According to the National Youth Tobacco survey conducted by the CDC among secondary and high school students, smoking and use of tobacco products rose in 2018 though this figure decreased in the last 30 days in 2011 and 2017.[3] The use of tobacco among the high school students declined by 19.6% from 24.2% in 2017. However, it rose by 27.1% in 2018 and 31.2% in 2019.[2,3] In Türkiye, the use of any tobacco product is 47% per cent among all the population groups during their lifetime. In the last month, this rate has been 31%.[4]

Using alcohol has harmful effects such as damaging the brain, causing some physical diseases, and causing social problems that may arise due to use of it, not attending the courses at school, or getting poor marks and achievement results in their courses.[5,6] Alcohol is widely used though it creates some risks for young individuals. According to the Youth Risk Behaviour Survey conducted by the CDC in 2019, it is concluded that 29% of high school students drank alcohol, while 14% of them drank it heavily in recent 30 days.[7] In Türkiye, the rate of alcohol use during one's lifetime is 22%. This rate is found to be 8.6% in the last month.[4]

Related to adolescent substance abuse may suffer from some physical disorders or psychological problems that may result in depression or even suicidal attempts, and social problems such as dropping out the school or communication disorders.[8] When the substance abuse of the general population in Türkiye during their lifetime is examined, it is concluded that 3,1% of the participants used a substance at least once. 35.4% of the substance users used it when they were between 15 and 24 years old.[4]

This study aims to determine the prevalence of smoking cigarettes, alcohol, and substance use among the high school students studying at the high schools located in the Yesilyurt and Battalgazi districts of the Malatya province as well as examine the relations between the influencing factors.

MATERIALS AND METHODS

Ethical Statement: To execute this research, written permission was obtained from the Scientific Research and Publication Ethics Board of Inonu University (dated 21.02.2017, decision no: 2017/4-2). The consent was obtained from the Non-Invasive Ethics Committee of the Medical Faculty of Inonu University. Furthermore, written permission was received from the Malatya National Directorate of Education, as well as the approvals of the individuals by international declarations, guidelines, and similar applications.

Participant, Design and Setting: This cross-sectional research population consists of 42629 students studying at 68 high schools in the Battalgazi and Yeşilyurt districts of Malatya. The types of these high schools where this study has been conducted are Anadolu, Vocational, and ImamHatip High Schools. The number of students at Anadolu High School is 17866, the number of students at Vocational High Schools is 14381 while this figure ImamHatip High School. First, as a sampling method, the stratified sampling method has been selected according to the types of high schools. For lower stratigraphy, three schools were selected by applying the simple random sampling method. In total, nine schools were selected. Thus, the random sampling method chose the students of four different grades. The minimum sampling size formula (n: Nt2pq / d2 (N-1) + t2pq) is applied in the case of the number of individuals among the population to determine the sampling size. When smoking prevalence is supposed to be 25%, the total figure was 846.

Instruments: The questionnaire form used to gather data consists of two sub-sections. The first section of the questionnaire includes questions relating to the students' socio-demographic characteristics. At the same time, the second section has questions about smoking, use of alcohol, and substance use.

Statistical Analysis: The independent variables of this study are age, sex, educational level of parents, and other socio-demographic factors while the dependent variables are smoking, use of alcohol, and substance use. The SPSS package program was used for statistical analysis. The complementary data is shown by n %. The chi-square test and the Binominal Logistical Regression analysis were used to assess the statistical analysis. For all the assessments, the value $p<0.05$ are accepted to be significant.

RESULTS

The socio-demographic characteristics of the students who participated in this study were given in Table 1. 51.2% are male; 28.5% are 17 years old. 92.2% of the students who participated in this study stated that they lived with their families. 39.6% of the fathers graduated from primary school or were illiterate, while 47.4% of the mothers graduated from primary school.

It was found that 34% of the students who participated in this study cigarette smoking, 14.3% of them used alcohol, and 4.2% of them used the substance.

The comparison of participants in terms of their cigarette smoke according to the different variations is

Table 1. Sociodemographic distribution of students participating in the study.

Sociodemographic Characteristics		n (%
Gender	Male	496 (51.2)
	Female	472 (48.8)
Age	≤15	185 (19.1)
	16	266 (27.5)
	17	276 (28.5)
	≥18	241 (24.9)
Type of School	Anatolian High School	358 (37.8)
	Vocational High School	294 (31.0)
	Imam Hatip High School	295 (31.2)
Whom do you live with?	With my family	886 (92.2)
	Other	82 (7.8)
Educational status of Father	Illiterate	17 (1.8)
	Primary school graduate	358 (37.8)
	Secondary school graduate	239 (25.2)
	High school graduate	236 (24.9)
	University – postgraduate degree	98 (10.4)
Educational status of Mother	Illiterate	152 (15.9)
	Primary school graduate	452 (47.4)
	Secondary school graduate	180 (18.9)
	High school graduate	138 (14.5)
	University – postgraduate degree	32 (3.3)
Total		**968 (100)**

shown in Table 2. Male cigarette smokes significantly more than females (p<0.001). 32.8% of those who live with their families' smoke, while 48.0% of those who live in a place other than their family household smoke (p=0.008). The smoking rate of the students whose fathers' education level is primary school or less is 27.9%, meaning they smoke significantly less than the other groups (p=0.009).

The males have alcohol significantly more (p=0.001). It is concluded that in the student groups whose parents have a higher education level, they use alcohol significantly more (p<0.05) (Table 3).

Table 2. The comparison of participants in terms of their cigarette use according to the different variations.

		Cigarette Smoking Yes n (%)	Cigarette Smoking No n (%)	p
Gender	Male	217 (43.8)	279 (56.39	0.001
	Female	111 (23.7)	358 (76.39	
Type of School	Anatolian High School	114 (31.8)	244 (68.2)	0.476
	Vocational High School	102 (34.7)	192 (65.39	
	Imam Hatip High School	106 (36.3)	186 (63.7)	
Educational status of mother	Illiterate	45 (29.8)	106 (70.2)	0.596
	Primary school graduate	149 (33.0)	302 (67)	
	Secondary school graduate	64 (35.8)	115 (64.2)	
	High school graduate	51 (37)	87 (63)	
	University–postgraduate degree	13 (40.6)	19 (59.4)	
Educational status of father	Illiterate	104 (27.9)	269 (72.1)	0.009
	Primary school graduate	81 (33.9)	158 (66.1)	
	Secondary school graduate	94 (40)	141 (60)	
	High school graduate	39 (39.8)	59 (60.2)	
Whom do you live with?	With my family	290 (32.8)	593 (67.2)	0.008
	Other	36 (48.0)	39 (52)	

Table 3. The comparison of participants in terms of their use of alcohol according to the different variations.

		Alcohol use Yes n (%9)	Alcohol use No n (%)	p
Gender	Male	87 (17.9)	398 (82.1)	0.001
	Female	48 (10.4)	414 (89.6)	
Type of School	Anatolian High School	78 (22.2)	273 (77.8)	0.001
	Vocational High School	37 (12.8)	252 (87.2)	
	Imam Hatip High School	17 (5.9)	269 (94.1)	

Table 3. Continue.

Educational status of mother	Illiterate	13 (8.8)	134 (91.2)	0.001
	Primary school graduate	52 (11.7)	392 (88.3)	
	Secondary school graduate	27 (15.3)	150 (84.7)	
	High school graduate	33 (24.3)	103 (75.7)	
	University–postgraduate degree	8 (26.7)	22 (73.3)	
Father educational status	Illiterate	37 (10.1)	328 (89.9)	0.001
	Primary school graduate	25 (10.7)	209 (89.3)	
	Secondary school graduate	45 (19.3)	188 (80.7)	
	High school graduate	24 (25.0)	72 (75.0)	
Whom do you live with?	With my family	123 (14.2)	742 (85.8)	0.833
	Other	10 (13.3)	65 (86.7)	

When the substance use of the students involved in this study is examined, it is found that 6.4% of the males and 1.9% of the females stated that they use substances, which means that the difference between them is significant (p=0.001). The substance use of those who live with their families is significantly lower (3.7%) than that of the students who do not live with their families (10.8%) (Table 4).

The Binominal Logistic Regression Analysis is given in Table 5. The cigarette smoking ratio is 2.2 times higher for male and female students. This ratio is 7.6 higher for the students who use alcohol than those who do not (p<0.001). The students whose fathers' education level is primary school or higher smoke 1.4 times more than those the education level of fathers is primary school or illiterate, while those who do not live with their families use it 1.742 times more than those who live with their families do (p=0.026). The alcohol use of smokers is 9.6 higher than those who do not smoke. This figure increases 26.8 times more if the family members use alcohol (p<0.001). The students have alcohol 1.7 times more when the parents are literate or have a higher level of education by comparison with the parents of the students who are illiterate (p<0.001). The rate of substance use for the drinkers is 12.2 higher as compared with those who do not drink, 2.4 higher as compared with the smokers, and 5.6 higher as

Table 4. The comparison of participants in terms of their use of alcohol according to the different variations.

		Substance Use		
		Yes n (%)	**No n (%**	**p**
Gender	Male	31 (6.4)	450 (93.6)	0.001
	Female	9 (1.9)	459 (98.1)	
Type of School	Anatolian High School	19 (5.5)	329 (94.5)	0.076
	Vocational High School	15 (5.1)	277 (94.9)	
	Imam Hatip High School	6 (2.1)	284 (97.9)	
Mother educational status	Illiterate	3 (2.0)	144 (98.0)	0.071
	Primary school graduate	16 (3.6)	428 (96.4)	
	Secondary school graduate	9 (5.0)	170 (95.0)	
	High school graduate	7 (5.2)	128 (94.8)	
	University-postgraduate degree	4 (12.9)	27 (87.1)	
Father educational status	Illiterate	9 (2.5)	357 (97.5)	0.280
	Primary school graduate	12 (5.0)	227 (95.0)	
	Secondary school graduate	12 (5.2)	218 (94.8)	
	High school graduate	4 (4.2)	91 (95.8)	
Whom do you live with?	With my family	32 (3.7)	836 (96.3)	0.004
	Other	8 (10.8)	66 (89.2)	

Table 5. Binomial logistic regression analysis of independent variables associated with cigarette, alcohol, and substance use.

	Smoking			
	B	**OR**	**p**	**CI %95**
Gender (Female)	0.817	2.263	0.001	1.661-3.073
Father education (primary school and less)	0.356	1.428	0.026	1.044-1.951
Whom do you live with (family)	0.555	1.742	0.039	1.029-2.946
Alcohol use (No)	2.032	7.630	0.001	4.919-11.834
	Drinking Alcohol			
	B	**OR**	**p**	**CI %95**
Gender (Female)	0.490	1.633	0.052	0.996-2.677
Educational status of the father (primary school and less)	0.131	1.140	0.645	0.652-1.993
Educational status of mother (illiterate)	0.567	1.763	0.032	1.030-2.960
Smoking (No)	2.265	9.635	0.001	5.712-16.250
Family alcohol use (No)	3.290	26.84 7	0.001	12.489-57.711
	Substance Use			
	B	**OR**	**p**	**CI %95**
Gender (Female)	0.589	1.801	0.196	0.738-4.395
Whom do you live with (family)	0.954	2.597	0.109	0.808-8.353
Alcohol use (No)	2.505	12.23 9	0.001	4.900-30.566
Smoking (No)	0.886	2.425	0.073	0.922-6.378
Family substance use (No)	1.725	5.613	0.017	1.366-23.068

compared with the family members who use substances ($p<0.05$) (Table 5).

DISCUSSION AND CONCLUSION

According to the data given by the European School Survey Project on Alcohol and Other Drugs (ESPAD) 2019, which surveyed smoking, drinking, and drug use among high school students, the minimum average smoking rate during the lifetime is % 41 while the current smoking rate is 27%. 3% of the students aged 13 or younger stated that they smoke every day.[9]

According to the alcohol use of the students examined by the ESPAD survey 79% of them use at least once during their lifetime, 47% of them said that they consumed it in recent thirty days while 13% of them suffered from intoxication due to alcohol consumption. When substance use was asked, 20% of the students said that they tried it at least once during their lifetime[9]. The prevalence of cigarette smoking is 34%, using alcohol is 14.3%, and using substances is 4.2% among the students who were involved in this study. In similar research conducted among adolescents, it was found that 15.8% of them smoke, and the rate of substance use is 5%.[10] According to the data given by the Global Tobacco Research conducted in Türkiye, the rate for those who tried tobacco products at least once during their lifetime is 38.6% while those who tried cigarettes are 27.9%.[11] Why the rate of cigarette smoking among the population in our study is remarkably high may relate to the number of the students who participated in it is 18 or above 18 years old. The smoking rate of male students is 2.2 times higher than that of female students. Likewise, the studies conducted in other cities of Türkiye state that men's smoking prevalence is significantly higher than women's.[10,12-14] The ESPAD 2019 survey demonstrates that cigarette smoking is significantly higher among men than women.[9] A study conducted in Russia found that the smoking prevalence is lower as compared with the figures in Türkiye. 15% of males and 8.3% of females' smoke cigarette.[15]

In the study group, it was found that the students who do not live with their families' smoke 1.7 times more than those who live with their families do. In the research made to determine the factors that affect cigarette smoking among university students, it was found that the most crucial factor influencing the student to smoke is that other people smoke where the student resides. This research concluded that the student is likely to smoke 9.4 times more if other people smoke where he or she resides.[16] Therefore, the existence of individuals smoking in places such as lodging, dormitory, pension, and guesthouse may have increased the prevalence of smoking among the students because of the peer effect.

When the relations between the parent's education level and smoking habit are examined, it is concluded that the students whose father's education is primary school or above smoke 1.4 more than those whose father's education level is lower than primary school or illiterate. Likewise, a study conducted among university students found that the higher the father's education level, the more the student smokes.[17] But our study did not find a significant difference between the mother's education level and smoking cigarettes. Likewise, a survey conducted for secondary and high school students demonstrated a significant difference between the mother's educa-

tion level and cigarette smoking.[18]

A study examining the alcohol use ratio according to gender found that men use alcohol significantly more than women do. Our study found the equivalent results.[19,20] On the other hand, a study that examined not only the alcohol use itself, but the amount of alcohol consumed found that women use it more, but the amount they have is 11.5% less than men.[21]

Our study revealed that the use of alcohol rises in parallel with the parent's education level. Still, there is no significant difference in the student's location. When the relationship between alcohol use and various variables was examined, it was seen that the use of alcohol relates to the education level of the mother, socioeconomic status, and chronic stress. Because of the probable effect of this stress, the students who do not live with their parents may be exposed to more risk of drinking alcohol.[22,23] Furthermore, our study shows that the rate of alcohol use increases if the family members use it. Whether the use of alcohol by the family members relates to affecting its use by the relevant person, it is determined that the rate of the disorders resulting from alcohol use is higher among alcohol addicts.[24]

The men who participated in this study stated that they use substances significantly more. A study that surveyed the use of cigarettes and substance among high school students demonstrates that male students use the substance remarkably.[10] In a study examining the determinants for substance use among high school students, it is seen that adolescents whose stress level is high or whose capacity is poor to cope with stress may face the risk of substance use more. Besides, it was found that the quality of the social support taken from the family members is related to substance use.[25] Likewise, our study found that the rate of substance use of those who live with their families is significantly lower than those who do not live with their families. In addition, our study demonstrates that the existence of a family member using substances increases the student's substance use rate. A study that conforms to our findings showed that the rate of substance use in the families of individuals who also use it is significantly higher.[24] When the relations between smoking cigarettes, using alcohol, and substance use with one another, it is concluded that out of the students who smoked at least once during their lifetime, 93% of them had alcohol, 32% of them smoked hashish and 10% of them got a sedative tablet.[10] Our study shows that the use of either cigarettes or alcohol increases the prevalence of the use of the other one. It was found that substance use increases the use of smoking and use alcohol, too. Similarly, the literature demonstrates that the interaction of nicotine inside cigarettes and ethanol alcohol increases the severity of addiction levels, and those who smoke or use illegal drugs have alcohol in remarkably high amounts.[26,27] A survey examining how smoking affects the treatment of alcohol addiction revealed that those who smoke during the treatment process are less likely to benefit from the treatment.[28]

In conclusion, smoking cigarette, drinking alcohol and substance use is important as there are risks when only one of them is used or the risks of using one of them increases to using another one. The students should be taught about the harmful effects of smoking as they mainly start to use it in these age groups. Students should be informed about the harmful effects of smoking, drinking, and substance use by implementing activities such as peer education and theatre plays. Furthermore, the concerned authorities must supervise the enforcement of the prohibition measures to sell cigarettes and drinks to those younger than eighteen. Particularly, the local authorities must abolish the derelict houses, where drugs are sold and used, close to the schools.

Ethics Committee Approval: To execute this research, written permission was obtained from the Scientific Research and Publication Ethics Board of Inonu University (dated 21.02.2017, decision no: 2017/4-2).

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The Relationship of Solitary Parathyroid Adenoma Volume with Pre- and Post-operative Parathormone and Calcium Levels

Soliter Paratiroid Adenom Hacminin Ameliyat Öncesi ve Sonrası Parathormon ve Kalsiyum Seviyeleri ile İlişkisi

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ABSTRACT

Objective: Parathyroid size, weight, position and histopathological characteristics have been investigated as possible candidates of predictive value. We aimed to investigate the relationship between the volume of the parathyroid gland as calculated by sonographic measurements and the amount of postoperative decrease in serum calcium and parathyroid hormone (PTH) levels.

Materials and Methods: Preoperative and postoperative plasma levels of corrected calcium and intact PTH were noted. The size of each adenomatous parathyroid gland was calculated as an ellipsoid based on the preoperative sonographic measurements using the formula "V=π/6 x diameters".

Results: A total of 61 (76.3%) females and 19 (23.8%) males were included in the study. The median age of the patients was 58 years. The average volume of the adenomatous parathyroid gland was calculated to be 13.4 cm3. Plasma levels of both calcium and PTH significantly decreased following surgery (p: 0.000, p: 0.000, respectively). There was significant correlation between the adenoma volume and the change in calcium value (r: -0.500, p: 0.000) but not for the PTH value (r: 0.036, p: 0.750).

Conclusion: Our significant results may suggest a relationship between the volume of adenoma and plasma calcium levels, but more extended studies with larger patient groups are needed for more consistent results.

Keywords: Adenoma, calcium, parathyroid, volume

ÖZ

Amaç: Paratiroid boyutu, ağırlığı, pozisyonu ve histopatolojik özellikleri olası prediktif değer adayları olarak araştırılmıştır. Bu çalışmamızda bizde sonografik ölçümlerle hesaplanan paratiroid bezi hacmi ile postoperatif serum kalsiyum ve parathormon (PTH) düzeylerindeki azalma miktarı arasındaki ilişkiyi araştırmayı amaçladık.

Materyal ve Metot: Ameliyat öncesi ve sonrası düzeltilmiş kalsiyum ve intakt PTH plazma seviyeleri kaydedildi. Her bir adenomatöz paratiroid bezinin boyutu, "V=π/6 x çaplar" formülü kullanılarak, ameliyat öncesi sonografik ölçümlere dayalı olarak bir elips şeklinde hesaplandı.

Bulgular: Çalışmaya toplam 61 (%76,3) kadın ve 19 (% 23,8) erkek dahil edildi. Hastaların medyan yaşı 58 idi. Adenomatöz paratiroid bezinin ortalama hacmi 13,4 cm3 olarak hesaplandı. Ameliyattan sonra hem kalsiyum hem de PTH'nin plazma seviyeleri önemli ölçüde azaldı (sırasıyla p<0,001, p<0,001). Adenom hacmi ile kalsiyum değerindeki değişiklik arasında anlamlı bir korelasyon varken (r: -0.500, p<0,001), PTH değeri için anlamlı bir ilişki yoktu (r: 0,036, p: 0,750).

Sonuç: Sonuçlarımız adenom hacmi ile plazma kalsiyum seviyeleri arasında bir ilişki olduğunu düşündürebilir ancak daha tutarlı sonuçlar için daha geniş hasta grupları ile daha kapsamlı çalışmalara ihtiyaç vardır.

Anahtar Kelimeler: Adenom, hacim, kalsiyum, paratiroid

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INTRODUCTION

Primary hyperparathyroidism (PHTP), with an estimated annual incidence of 34 to 120 cases per 100,000 people, is a relatively common endocrine disorder caused by parathyroid adenomas in 80-85% of the cases.[1]

Due to the increasing availability of routine laboratory testing, many parathyroid adenomas are discovered incidentally during diagnostic workups for other pathologies, increasing the overall incidence. Many parathyroid adenomas are diagnosed while still asymptomatic.[2] Depending on the etiology of hyperparathyroidism, plasma calcium and vitamin D levels might be normal or low, while plasma PTH might be "inappropriately normal", i.e., unsuppressed despite hypercalcemia.[3]

The preferred mode of treatment of primary hyperparathyroidism for all symptomatic cases and asymptomatic cases fulfilling any of the following criteria is surgery. Surgery in asymptomatic patients offers the promise of a definitive cure and should be recommended to those who meet any one of the following criteria: hypercalcemia level consistently >1 mg/dL above average; fracture; renal stones, hypercalciuria and other stone risk factors; T-score <−2.5 at any site; and age <50 years.[4] While surgery aims to achieve a significant decrease in serum parathyroid hormone (PTH), which results in the correction of previously elevated serum calcium levels, hypocalcemia is a common and potentially severe complication.[4,5] Therefore, it is of paramount importance for endocrine surgeons to predict the extent of the decrease in calcium levels after surgery to be able to take the necessary precautions before the onset of symptoms.

Numerous studies attempted to estimate the effect of parathyroidectomy on postoperative calcium and PTH levels. Parathyroid size, weight, position, and histopathological characteristics have been investigated as possible candidates for predictive value.[6] Unfortunately, a correlation between any of these parameters and postoperative change in either calcium or PTH levels is yet to be established by multiple studies and widely accepted by the endocrine community.[5] Since preoperative imaging studies are routinely performed in most endocrine surgery centers, data derived from such studies can be made readily available at no extra cost.

Thus, we aimed to investigate the relationship between the volume of the parathyroid gland as calculated by sonographic measurements and the change in postoperative values compared to preoperative calcium and PTH values.

MATERIALS AND METHODS

Ethics Committee Approval: For this study, it was obtained from the Istanbul Training and Research Hospital Clinical Research Ethics Committee (Date: 08/11/2019, decision no: 2047). Informed consent was obtained from all patients, and the study was performed according to international declarations.

Patient Feature: Data from 80 consecutive patients with PHPT operated in a single center with experience in endocrine surgery was retrospectively analyzed. Patients with multiple adenomatous parathyroid glands or a history of prior neck surgery were excluded. The age and gender of the patients, as well as the localization of the adenomatous glands, were recorded.

Analysis: Both preoperative (before any medical treatment) and postoperative (one day after surgery) plasma levels of corrected calcium and intact PTH were analyzed. The size of each adenomatous parathyroid gland was calculated as an ellipsoid based on the preoperative sonographic measurements, using the formula $V=\pi/6 \times ABC$ (A, B and C being the dimensions in cm).

Statistical Analysis: Statistical analysis was performed using the IBM® SPSS® Statistics 26.0 software (IBM, Armonk, New York, USA). Mean, standard deviation, median, minimum, and maximum values, frequency, and percentage were used for descriptive statistics. The distribution of variables was tested using the Kolmogorov-Smirnov test. Wilcoxon signed-rank test was used for the analysis of repeated measurements. The correlation was determined using Spearman's rank correlation coefficient. The p-value less than 0.05 were considered statistically significant.

RESULTS

Of the 80 patients included, 61 (76.3%) were female, and 19 (23.8%) were male. The ages of the patients ranged from 22 years to 82 years, with a mean age of 57.4±13.3 years. The adenomatous gland was most commonly the lower left parathyroid, with 35 cases (43.8%), followed by 26 (32.5%) in the lower right, 11 (13.8%) in the upper left, and 8 (10.0%) in the upper right. The average volume of the adenomatous parathyroid gland was calculated to be 13.4 cm^3 and the minimum and maximum sizes were 9 and 21 cm^3 respectively (Table 1).

Plasma levels of both calcium and PTH significantly decreased following surgery ($p<0.05$). The calcium and PTH measurements are summarized in Table 2.

Spearman's rank correlation test demonstrated a significant correlation between the adenoma volume with preoperative and postoperative plasma calcium levels and the change in calcium. However, no such correlation of statistical significance was present between the adenoma volume and plasma PTH levels. Table 3 lists the correlation coefficients for the different variables.

Table 1. The demographic data of the patients and the location of the adenomas.

		Patients (n:80)
Age of patients (years), mean ±SD		57.4±13.3
Adenoma volume (cm^3), mean ±SD		13.4±19.9
Gender, n (%)	Female	61 (76.3)
	Male	19 (23.8)
Localization of the adenoma, n (%)	Lower left	35 (43.8)
	Lower right	26 (32.5)
	Upper left	11 (13.8)
	Upper right	8 (10.0)

Table 2. The preoperative and postoperative analysis of the calcium and parathyroid hormone.

	Preoperative	Postoperative	p-value
Ca, mean ±SD	11.6±1.1	9.0±0.9	0.001
PTH, mean ±SD	316.5±261.7	49.4±39.7	0.001

Ca: corrected plasma calcium (mg/dL); PTH: intact parathyroid hormone (pg/mL).

Table 3. Correlation analysis of the volume of parathyroid adenoma with serum calcium (pre- and post-operative) and serum PTH levels.

	Ca			PTH		
	Preoperative	**Postoperative**	**% change**	**Preoperative**	**Postoperative**	**% change**
r	0.384	-0.300	-0.500	0.154	0.179	0.036
p-value	0,001	0.007	0,001	0.174	0.113	0.750

Ca: corrected plasma calcium (mg/dL); PTH: intact parathyroid hormone (pg/mL); r: Spearman's correlation coefficient.

DISCUSSION AND CONCLUSION

For a successful parathyroidectomy, a surgeon needs a precise localization and the number of parathyroid glands that must be removed. Therefore, an adequate preoperative diagnostic patient processing is needed . One of the important factors for the indication of surgery is, among others, the value of parathormone.

Predicting the presence of a large parathyroid adenoma and measuring surgical specimen dimensions after excision may have some clinical importance. In fact, as the parathyroid adenoma expands, the proportion of solitary components increases more and the likelihood of it being benign decreases. However, a giant parathyroid adenoma may sometimes mask the presence of a second, smaller adenoma.[7]

The concordance of an accurate preoperative localization and high preoperative PTH values with the excision of a large adenoma and a rapid decrease of PTH makes the presence of a solitary adenoma very likely.[8]

In our study, the female-to-male ratio was approximately 3:1, and among a group ranging from 22 to 82 years of age, the mean age was 57.4 years (±13.3), with the median also at 58. Median adenoma volume is 13,4 cm^3. Lower left localization is the most common position (%43,8) of the adenoma . Sekond most common position is lower right (%32,5).

These findings are similar the literature based on both historical and recent data from different populations.[9] Despite significant differences among ethnic groups and a drastic increase in the incidence of the disease, mainly attributed to the incidental diagnosis of asymptomatic or mildly symptomatic cases, the male-to-female ratio is consistent. However, contrary to epidemiological studies, which demonstrate that the age-adjusted incidence of PHPT increases with age, the ages of our study population had clustered in the late 50 years.[10] This is due to the design of our study, which includes only patients operated for PHPT rather than being a population survey. Patient age being one of the indications for surgery and early postmenopausal women being more likely to undergo bone mineral density scanning than the elderly, resulting in increased diagnoses of asymptomatic osteoporosis, are possible reasons for the age distribution of our study population. Other studies based on operative findings have also reported similar results, which supports our interpretation.[11]

Adenomatous parathyroid glands were most frequently the inferior parathyroids, with a tendency for left-sided adenomas. Matsushita et al. demonstrated in 1984 that the functional level of the inferior parathyroid glands was higher than the superior ones. As such, they tend to have a greater capacity for hyperplasia and a decrease in size in states of suppressed PTH secretion.[12] The larger parenchymal area and higher potential for hyperplasia might be why ade-

nomas develop more frequently in the inferior glands.

Numerous studies have investigated the relationship between adenoma size and biochemical parameters such as PTH, vitamin D, calcium, and phosphorus. As a measure of the size of the adenoma, different studies used either weight or volume.

A review in the literature is the most extensive series correlating preoperative calcium and PTH values with operative findings of gland size and several diseased glands. Although a lower calcium value predicts somewhat more multi-gland disease, the poor correlation should make the parathyroid surgeon aware that preoperative laboratory testing cannot predict gland size and multi-gland disease.[13]

Randhawa et al. have measured both weight and volume of the adenomas and found a strong correlation, making it possible to compare results from studies measuring either the weight or the volume of the adenomatous parathyroid gland.[11]

Since it can be calculated preoperatively by data obtained from ultrasonography alone, volume is more useful in predicting biochemical variables well in advance of the operation.

The results from the current study suggest a statistically significant relationship between adenoma volume and plasma calcium levels but not PTH. Results from other studies in the literature could be more consistent.

Gatu et al. from Romania concluded that the volume of a parathyroid adenoma was related to preoperative PTH but not calcium levels.[14] Other studies have observed a correlation between parathyroid size and both calcium and PTH levels.[15] Jubran reported that the size of the parathyroid gland not correlated with the preoperative PTH values in 35 cases.[16]

In conclusion, primary hyperparathyroidism is among common endocrine disorders, usually caused by adenomas which may lead to morbidity and mortality. Former studies have focused on the preoperative estimation of parathyroidectomy on postoperative serum calcium and PTH levels. In our study, we aimed to evaluate the possible role of the volume of solitary parathyroid adenoma in predicting postoperative serum levels of PTH and calcium. Our significant results may suggest a relationship between the volume of the adenoma and plasma calcium levels, but extended studies with larger patient groups are needed for more consistent results.

Ethics Committee Approval: Our study was approved by the Saglik Bilimleri University, Istanbul Training and Research Hospital Ethics Committee (Date: 08/11/2019, decision no: 2047). The study was carried out following the international declaration, guidelines, etc.

Conflict of Interest: No conflict of interest was declared by the authors.

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Sleep Quality in Children with Iron Deficiency Anemia

Demir Eksikliği Anemisi Olan Çocuklarda Uyku Kalitesi

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ABSTRACT

Objective: Iron deficiency is the most common cause of anemia in our country as well as all over the world. In this study, it was aimed to evaluate the subjective sleep quality of patients with iron deficiency anemia in childhood.

Materials and Methods: One hundred thirty patients diagnosed with iron deficiency anemia and 110 healthy individuals, gender and age-matched, who applied to the Pediatrics clinic between April 2022 and September 2022, were included in the study. All participants were requested to fill out three forms: a socio-demographic form (age, gender, income level), hemogram laboratory findings and The Pittsburg Sleep Quality Index (PSQI) measures subjective sleep quality, was applied, and the data were analyzed.

Results: Total PSQI score was 6.56±3.51 in patients, and 4.36±2.34 in controls. There was a difference between the study and control groups in terms of low hemoglobin, hematocrit, mean erythrocyte volume (MCV) and mean erythrocyte hemoglobin concentration (MCHC) values and decreased sleep quality.

Conclusion: Iron deficiency anemia is a significant public health problem that adversely affects sleep quality in childhood.

Keywords: Childhood, iron deficiency anemia, sleep quality

ÖZ

Amaç: Tüm dünyada olduğu gibi ülkemizde de aneminin en sık sebebi demir eksikliğidir. Bu çalışmada çocukluk çağında demir eksikliği anemisi saptanan hastalarda sübjektif uyku kalitesinin değerlendirilmesi amaçlanmıştır.

Materyal ve Metot: Nisan 2022-Eylül 2022 tarihleri arasında Pediatri kliniğine başvuran yaşları ve cinsiyetleri eşleşmiş 130 demir eksikliği anemisi tanısı alan hasta ve 110 sağlıklı birey çalışmaya dahil edildi. Tüm katılımcılara yaş, cinsiyet, gelir düzeyleri gibi sosyodemografik bilgileri, hemogram laboratuvar bulguları ve subjektif uyku kalitesini ölçen Pittsburg Uyku Kalitesi İndeksi (PUKİ) ölçeğini içeren 3 formdan oluşan anket uygulandı. Veriler analiz edildi.

Bulgular: Hasta grubun toplam PUKİ puanı 6,56±3,51 kontrol grubun 4,36±2,34 idi. Düşük olan hemoglobin, hematokrit, ortalama eritrosit hacmi (MCV) ve ortalama eritrosit hemoglobin konsantrasyonu (MCHC) değerleri ile azalmış uyku kalitesi açısından çalışma ve kontrol grubu arasında fark saptanmıştır.

Sonuç: Önemli bir halk sağlığı sorunu olan demir eksikliği anemisi çocukluk çağında uyku kalitesini kötü yönde etkilemektedir.

Anahtar Kelimeler: Çocukluk çağı, demir eksikliği anemisi, uyku kalitesi

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INTRODUCTION

Iron deficiency anemia (IDA) develops when the negative iron balance due to hemoglobin synthesis, chronic blood loss, increased iron requirement, and malabsorption cannot be compensated from the stores.[1] As in the whole world, the most common cause of anemia in our country is iron deficiency, and it is more common in women than men.[2] More than 30% of patients admitted to the emergency department in developed countries are anemic, and this rate is much higher in developing countries.[3,4] Symptoms such as loss of appetite, fatigue, pallor, lethargy, headache, tinnitus, cognitive and intellectual dysfunction can be seen in iron deficiency anemia. Iron plays a crucial role in monoamine metabolism in the brain, responsible for mood and cognitive functions. Apathy, irritability, lack of attention and depressive temperament develop due to impaired monoamine oxidase.[5]

Sleep is biological, physiological, periodic, and reversible changes in consciousness and behavior, allowing the body to rest physically and renew itself.[6] Sleep problems are seen in 30-33% of the population. This rate is higher in the elderly, adolescents, pregnant women, and those with psychiatric disorders and learning difficulties. Many studies have shown female gender, stress, depression, anxiety, physical illness, and alcohol or substance use in the etiology of sleep disorders.[6,7] The balance of serotonin, noradrenaline and dopamine neurotransmitters plays a role in sleep neurophysiology.[5,8] The enzymatic balance disrupted in iron deficiency adversely affects sleep quality.[9]

In this study, it was aimed to evaluate the subjective sleep quality of patients with IDA in childhood.

MATERIALS AND METHODS

***Ethics Committee Approval*:** This prospective and cross-sectional study was conducted in the Pediatrics Clinic of Samsun Training and Research Hospital between April 2022 and September 2022. Ethics committee approval was obtained from the Ethics Committee of Samsun Training and Research Hospital (Date: 26.2.2022, decision no:2022/3/1), and conducted by the Declaration of Helsinki.

Design, Participants, and Setting: A total of 130 patients aged 12-18 years were diagnosed with IDA and 110 healthy individuals matched by gender and age were included in the study. It was confirmed that the patients had no accompanying neurological or endocrinological disease. Since anemia parameters vary according to age and gender until the age of 12, hemoglobin level is below 13 mg/dL in boys, below 12 mg/dL in girls, transferrin saturation rate is below15%, and ferritin level is below 15 ng/ml, those were considered IDA. The control group consisted of healthy volunteers. Individuals who were similar to the group diagnosed with IDA in terms of age and gender were invited to the study. Informed consent was obtained from the participants and their parents. Patients with chronic disease or regular medication were excluded from the study.

Instruments: A questionnaire including sociodemographic information such as age, gender, income level, hemogram laboratory findings, and the Pittsburg Sleep Quality Index (PSQI) scale, which measures subjective sleep quality, was administered face-to-face to the participants.[10] PSQI is a 19-item test that evaluates seven subgroups: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, use of sleeping pills, and daytime dysfunction. There is an evaluation table in which each subgroup is scored between 0-3 points, with a maximum of 21 points. High scores are associated with poor sleep quality. A total score of 6 or more indicates impaired sleep quality. The Turkish version was developed by Ağargün et al.[11]

Statistical Analysis: SPSS 25.0 (Statistical Package for the Social Sciences, Version 25.0, Chicago, USA) statistical program was used for statistical analysis. Continuous variables were given as mean± Standard deviation (SD), and categorical variables as percentages. The independent sample t-test was used to compare the data of patients and healthy individuals. The chi-square (x2) test was used to compare the data presented as a percentage. Pearson correlation coefficient was used for correlation analysis. $P<0.05$ was considered statistically significant in all data.

RESULTS

The patient population consisted of 130 patients (101 (77.7%) girls and 29 (22.3%) boys), and the mean age was 15.10±1.74 years. The control group consisted of 110 healthy individuals (85 (77.3%) girls and 25 (22.5%) boys), and the mean age was 15.21±1.94 years. There was no statistically significant difference between the patient and control groups regarding age, gender, and income level. The sociodemographic characteristics of the study groups are given in Table 1.

There was a statistically significant difference between the groups in terms of hemoglobin, hematocrit, mean corpuscular volume (MCV), mean corpuscular hemoglobin concentration (MCHC) values ($p=0.001$, $p=0.001$, $p=0.014$ and $p=0.001$, respectively). There was no significant difference between the groups in terms of other hemogram parameters ($p>0.05$). Detailed hemogram values are given in Table 2.

Table 1. Sociodemographic findings of the participants in the study.

		Patients n (%)	Controls n (%)	Statistics (x^2)	p-value
Gender	Female	101 (77.7)	85 (77.3)	0.701	0.794
	Male	29 (22.3)	25 (22.5)		
Income level	Low	34 (26.2)	27 (24.5)	0.041	0.991
	Medium	76 (58.5)	62 (56.4)		
	High	20 (15.3)	21 (19.1)		
Age group	12-15 years	48 (36.9)	35 (31.8)	0.563	0.454
	15-18 years	82 (63.1)	75 (68.2)		

Table 2. Distribution of hemogram values.

	Patients Mean±SD	Controls Mean±SD	t-value	p-value
Hemoglobin (gr/dL)	10.26±1.40	13.86±0.51	25.62	**0.001**
Hematocrit (%)	32.30±3.32	40.49±2.31	24.28	**0.001**
MCV (fL)	71.06±7.20	81.81±5.22	13.02	**0.014**
MCH (pg)	22.42±1.05	24.70±0.98	13.20	0.118
MCHC (g/dL)	31.61±1.39	34.31±0.98	17.07	**0.001**
WBC (mcL)	6.60±1.50	6.92±1.48	1.68	0.356

p<0.05 statistically significant; SD: standard deviation; MCV: mean corpuscular volume; MCH: mean corpuscular hemoglobin; MCHC: mean corpuscular hemoglobin concentration; WBC: white blood cell.

Evaluating the subjective sleep score was according to the sub-dimensions of PSQI, the sub-dimensions of subjective sleep quality, sleep latency, sleep time, habitual sleep efficiency, and daytime dysfunction were statistically significantly higher in the patient group (p<0.001, p<0.001, p=0.012, p=0,049 and p<0.001, respectively). No statistically significant difference was found between the two groups in the sub-dimensions of sleep disturbance and the use of sleeping pills (p>0.05). The comparison of the PSQI subscale and total scores between the groups is given in Table 3.

Table 3. Pittsburg sleep quality index score distribution.

Category	Patients (Mean±SD)	Controls (Mean±SD)	t-value	p-value
Subjective sleep quality	1.37±0.91	0.83±0.78	4.88	**0.001**
Sleep latency	1.27±0.98	0.80±0.86	3.96	**0.001**
Sleep time	0.70±0.73	0.45±0.77	2.52	**0.012**
Habitual sleep activity	0.64±0.77	0.44±0.72	1.97	**0.049**
Sleep disorder	1.24±1.00	1.06±0.97	1.45	0.147
Use of sleeping pills	0.04±0.30	0.02±0.19	0.84	0.401
Daytime dysfunction	1.30±0.79	0.74±0.85	5.21	**0.001**
Total sleep disorder score	6.56±3.51	4.36±2.34	5.58	**0.001**

p<0.05: statistically significant.

DISCUSSION AND CONCLUSION

Iron is essential mineral for body metabolism and normal physiological processes.[1] Since it is not produced in the body, it must be taken in sufficient amounts through food. The most important function of iron in the body is the production of hemoglobin. Hemoglobin is found in the red blood cells in our blood and carries out the process of carrying the oxygen necessary for the survival of all tissues.[4] In other words, the more important oxygen is for our life, the more important iron is for the use of oxygen.[2] Iron deficiency anemia may develop due to insufficient iron intake, decreased absorption, increased iron requirement, and increased iron loss due to reasons such as gastrointestinal bleeding, menstrual bleeding or hemolysis.[1] Iron is also required for electron transfer, DNA synthesis, methylation, immunological reactions, and the function of many vitally important enzymes and proteins in the neurologic system.[3,4]

Iron deficiency anemia causes behavioral and developmental disorders by negatively affecting myelination, metabolic activity of neurons, and the bal-

ance of serotonin, noradrenaline and dopamine transmitters.[5] Brain functions such as cognition and learning are also adversely affected in children with IDA.[13] Iron has a complex effect on dopaminergic functions. Neuromodulation by dopamine plays a vital role in regulating REM sleep quality, quantity, and time. The mechanisms controlling sleep-wake regulation in human studies were investigated in combination with pharmacogenetics and neurophysiology, and genes encoding dopamine transport (DAT1, SLC6A3) were found to be responsible for these tasks.[14,15] In primate model studies, it has been observed that the circadian rhythm is impaired after a dopaminergic nigro-striatal system lesion.[16] It is now believed more than before that sleep-wake disorders are caused by dopamine loss rather than inadequate lighting conditions.

The most important issue in sleep quality is the dynamic balance between neurotransmitter systems.[14] The alternation of NREM and REM sleep ensures the balance of brainstem aminergic and cholinergic neuronal discharges.[13] In studies on sleep segments and their organization, a longer REM period in the first part of the sleep, a shorter REM in the third part, and a shorter NREM 2 transition to REM were observed. This result showed that IDA caused long-term changes in the temporal organization of sleep patterns.[17]

Iron deficiency continues to be a common problem that may have detrimental and potentially irreversible effects on long-term neurodevelopment and behavior in growing children.[18] The effect of iron deficiency on sleep has been well documented, especially in the pathogenesis of restless legs syndrome (RLS). The diagnostic criteria of RLS rely on the patient description of an often-unpleasant urge to move the legs that lead to significant disturbance not explained by another medical or behavioral condition.[19] Parents are concerned that their child's poor sleep quality is leading to daytime dysfunction such as increased sleepiness, behavioral outbursts, or hyperactivity. Many of these children are diagnosed with behavioral insomnia in childhood, and behavior modification therapy is recommended with variable degrees of success. Although behavioral therapy has been the mainstay for these patients, we consider other possible contributing factors, like poor sleep, that could stem from an easily diagnosed and treatable cause such as iron deficiency.[20]

Many studies highlight the importance of evaluating for underlying iron deficiency even without anemia in patients with restless sleep and associated poor daytime behavior.[20,21] Kotagal reported a boy had an iron deficiency that was treated with ferrous sulphate tablets and gabapentin at bedtime was added to provide symptomatic relief from the sensory discomfort of restless legs syndrome. Concurrent with a rise in the serum ferritin level, the sleep quality improved over the next 2 to 3 months.[22] A study about iron deficiency and its role in sleep disruption in patients with Angelman Syndrome shows that there is an increased prevalence of sleep-wake disruption in children with Angelman syndrome. In part, this is related to iron deficiency, with or without the associated polysomnographic marker of increased periodic limb movement in sleep. The treatment of Angelman syndrome–related sleep fragmentation with oral or intravenous iron may be helpful in improving subjective sleep quality.[23] Evidence-based and consensus clinical practice guidelines for the iron treatment of restless legs syndrome/Willis-Ekbom disease in adults and children Ferric carboxymaltose (1000 mg) is effective for treating moderate to severe RLS in those with serum ferritin <300 mg/l and could be used as first-line treatment for RLS in adults. Oral iron (65 mg elemental iron) is possibly effective for treating RLS in those with serum ferritin <75 mg/l. There is insufficient evidence to make conclusions on the efficacy of oral iron or IV iron in children.[19]

Studies conducted with hemogram values in adult patients have shown that sleep quality decreases with low hemoglobin values.[24,25] In a prospective and cross-sectional study conducted with adult IDA patients and controls in Turkey, in terms of haemoglobin, hematocrit and MCV values, there was a statistically significant difference between the groups (t=16.95, p=0.001; t=6.77, p=0.001; t=15.78, p=0.001, respectively). The other hemogram parameters did not show any differences between the groups. In PSQI, 70 (67.3%) patients and 32 (40.5%) controls reported a bad sleep quality. The number of patients who reported a bad sleep quality was statistically significantly higher than the controls (x^2=13.072; p<0.001). The total sleep quality score was 6.71±3.02 in patients and 4.11±1.64 in controls. In terms of total PSQI score, there was a statistically significant difference between the groups (t= 6.94, p<0.001).[24] In our study we found statistically significant differences between the groups in terms of hemoglobin, hematocrit, MCV, and MCHC values. The sub-dimensions of subjective sleep quality, sleep latency, sleep time, habitual sleep efficiency, and daytime dysfunction were statistically significantly higher in the patient group. Our results were similar, and no difference was found between children and adults. In a recent study PSQI, scores decreased significantly following iron supplementation, whereas the scores of almost subscales improved significantly at week 12. No participant had hemoglobin levels <12 g/dL. Serum ferritin concentration increased significantly, whereas hemoglobin and MCV remained unchanged. At baseline, 74% of the participants did not attend school regularly; this number improved to varying degrees

by week 12. Since our study was retrospective, ferritin levels were not studied in most participants, so we could only compare them with hemogram parameters.[26]

The association of attention deficit hyperactivity disorder (ADHD), depression, low intelligence capacity and poor concentration in pediatric patients with iron deficiency anemia has been shown in studies.[13,27] Yehuda et al. conducted a study with the effects of essential fatty acids in iron-deficient and sleep-disturbed ADHD children patients generally suffer from sleep disturbance and malnutrition that can account for tiredness during the day, poor concentration, poor eating and depressed mood, along with anemia and an n-3 polyunsaturated acid deficiency. The change in ADHD behavior in children (9–12) was studied, following 10 weeks of treatment with a polyunsaturated acid mixture on six variables: cooperation, mood, concentration, homework preparation, fatigue, and sleep quality. Iron status was also examined. Polyunsaturated acid administration was associated with significant improvement in quality of life, ability to concentrate, sleep quality and hemoglobin levels.[28] In this study it is not clear if iron deficiency is one of the core symptoms of this group or it is a consequence of poor food intake habits.

In conclusion, this study showed that subjective sleep quality in pediatric patients with IDA was worse than in healthy controls. The effects of anemia treatment on sleep quality could not be evaluated due to the study's cross-sectional nature. Multicenter advanced studies are needed for long-term follow-up and treatment of IDA patients, which is also a significant public health problem. Sleep quality is measured with polysomnographic objective evaluations. There are some limitations in the study. First, polysomnography is not performed, and objective sleep quality cannot be evaluated. Second, regional and cross-sectional studies may not reflect the overall results.

Ethics Committee Approval: This study was performed in line with the principles of the Declaration of Helsinki. Approval was guaranteed by the Non-Interventional Clinical Research Ethics Committee of the University of Health Sciences, Samsun Training and Research Hospital (Date: 26.2.2022, decision no: 2022/3/1).

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Core Strength, Balance and Scapular Dyskinesia in Upper Extremity Sports: A Cross-Sectional Study

Üst Ekstremite Sporlarında Kor Kuvvet, Denge ve Skapular Diskinezi: Gözlemsel bir Araştırma

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ABSTRACT

Objective: This study aimed to assess the effect of scapular dyskinesia on core strength and upper extremity dynamic balance.

Materials and Methods: The study included 49 volunteer participants who were active volleyball or basketball players at Aydın Adnan Menderes University Faculty of Sport Sciences. The presence of dyskinesia in the study was assessed with the Lateral Scapular Slide Test; core strength was assessed with the Modified Side Plank Test and the Biering-Sorenson Test; and, upper extremity balance was evaluated with the Upper Quarter Y-Balance Test (YBT-UQ). Independent groups t-test and Mann Whitney U test were used to compare independent group differences.

Results: While 17 (34.7%) athletes had scapular dyskinesia, 32 (65.3%) did not have scapular dyskinesia. In athletes without dyskinesia, Modified Side Plank Test scores and dominant YBT-UQ total scores, and non-dominant YBT-UQ total scores were statistically higher than those with scapular dyskinesia ($p<0.05$). No significant difference is detected between groups according to Biering-Sorenson Test ($p>0.05$).

Conclusion: Based on the present results, it is recommended to include exercises for developing balance and core muscles to provide scapular stabilization in the training of the upper extremity sports.

Keywords: Balance, core strength, scapular dyskinesia, upper extremity

ÖZ

Amaç: Bu çalışma, skapular diskinezinin kor kuvveti ve üst ekstremite dinamik dengesi üzerindeki etkisini değerlendirmeyi amaçladı.

Materyal ve Metot: Çalışmaya Aydın Adnan Menderes Üniversitesi Spor Bilimleri Fakültesi'nde aktif olarak voleybol veya basketbol oynayan 49 gönüllü dahil edildi. Çalışmada diskinezi varlığı Lateral Scapular Slide Test ile; kor kuvveti, Modifiye Yan Plank Testi ve Biering-Sorenson Testi ile; üst ekstremite dengesi ise üst ekstremite Y-Denge Testi (YBT-UQ) ile değerlendirildi. Bağımsız grup farklılıklarının karşılaştırılmasında bağımsız gruplar t testi ve Mann Whitney U testi kullanıldı.

Bulgular: 17 (%34,7) sporcuda skapular diskinezi bulunurken, 32 (%65,3) sporcuda skapular diskinezi yoktu. Diskinezisi olmayan sporcularda, Modifiye Yan Plank Testi puanları ve dominant YBT-UQ total skorları ve non-dominant YBT-UQ total skorları, skapular diskinezisi olanlardan istatistiksel olarak daha yüksekti ($p<0,05$). Biering-Sorenson Testine göre gruplar arasında anlamlı bir fark saptanmadı ($p>0.05$).

Sonuç: Mevcut sonuçlara dayanarak, üst ekstremite sporlarının eğitimine skapular stabilizasyonu sağlamak için denge ve core kasları geliştirmeye yönelik egzersizlerin dahil edilmesi önerilmektedir.

Anahtar Kelimeler: Denge, kor kuvveti, skapular diskinezi, üst ekstremite

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INTRODUCTION

Athletes using their upper extremities make high-speed specific movements. To perform these movements, it is important to have various features such as flexibility, muscle strength, coordination, synchronicity, and neuromuscular control in the shoulder girdle.[1]

Movement, muscle strength, and endurance are also required around the lumbar spine to attain functional stability during shoulder movements. The most crucial elements of muscle activation in this region are the core muscles.[2] The core muscles, frequently used in upper extremity sports, are the muscle groups that actively work in the forward-throwing movement. Power transfer with minimal energy from the lower extremity to the upper extremity occurs with a strong core region.[3]

Researchers have focused on core muscles as well as the neighboring structures because of their functions, and have shown that the scapula, shoulder muscles, and lower extremity muscles operate in coordination with the core muscles and create controlled movements.[4]

Balance is an integral part of core stability. Neuromuscular imbalance occurs between many synergistic and antagonistic muscles. This imbalance can cause excessive joint movement and instability in overhead movements.[5,6]

The presence of Scapular dyskinesia (SD) in overhead athletes is usually explained by the dominant scapula having one or more of the inferior, protraction and abduction components compared to the non-dominant scapula.[7] The scapula is positioned between the trunk and arm; it provides energy transfer from the lower extremity and trunk to the upper extremity to maximize its potential while minimizing the risk of injury. In order to achieve adequate scapular control, it is the strength of the trunk muscles that enables the athlete to use the lower and upper extremities synchronously. Therefore, loss of control in the scapular region may be related to loss of control in the trunk muscles, which are responsible for stabilising the extremities.[8]

Considering the high prevalence of shoulder injuries that occur in upper extremity sports and SD is associated with shoulder injuries. Therefore, there is a need to examine further the correlation between SD and core strength and balance. This study aimed to assess the effect of scapular dyskinesia on core strength and upper extremity dynamic balance.

MATERIALS AND METHODS

Ethics Committee Approval: Ethical approval of the study was obtained from Aydın Adnan Menderes University Faculty of Medicine Ethics Committee (Date: 27.04.2020, decision no: 2020/63). The research was carried out according to the Helsinki Declaration Principles.

Study Group*:* This study was planned as a cross-sectional study. The subjects consisted of 56 playing basketball and volleyball athletes at the university. All athletes who agreed to participate in the study were included based on the inclusion criteria. Between the ages of 18-25, studying at Aydın Adnan Menderes University Faculty of Sport Sciences and using their upper extremities were included in the study. Individuals with cardiovascular, physical or psychological disorders were not included in the study. A total of 49 volunteer basketball (n=21) and volleyball (n=18) players (26 men, and 23 women) participated in the study.

Procedures*:* Before the study, all participants signed a voluntary consent form describing the purpose and possible risks of the study. After the anthropometric measurements, a standardized 10-minute warm-up program was applied before the tests were applied. The warm-up program included running and dynamic stretching, similar to Çakır and Ergin's (2022) study.[9] The Modified Side Plank Test and the Biering-Sorenson Test were used to assess the core strength values of the athletes participating in the study. The Upper Quarter Y-Balance Test (YBT-UQ) was used to determine the balance values, and the Lateral Scapular Slide Test (LSST) was used to determine SD.

After the tests were completed, the participants were divided into two groups according to the presence of scapular dyskinesia: with dyskinesia and without dyskinesia.

Instruments

Demographic Information Form: In the study, the researcher-designed Demographic Information Form, which included questions about gender, age, the sports branches of athletes, and tenure in sports (years), was used.

Modified Side Plank Test: The lateral bridge test is used to evaluate the lateral core muscles. The participant was positioned in the side-lying position. The participant was asked to move their hips away from the table using their feet and the lower part of their elbows. The test was finalized when the participant could not keep this position.[10]

Biering- Sorenson Test: It is known as the oldest endurance test in the literature. The participant was in the prone position, with the pelvis and lower extremities fixed on the treatment table, while the torso was held in the horizontal plane without support. The test was terminated after 240 seconds or when they could not maintain the horizontal plane.[10]

Upper Quarter Y-Balance Test (YBT-UQ): It is used to evaluate the balance, functionality, and stability of the upper extremity and trunk. The assess-

ment was started in a push-up position with both arms shoulder-width apart. Starting with the non-dominant hand, the maximum reachable distance was recorded in the medial, inferolateral, and superolateral directions.[11] During the tests, in cases where the feet were off the ground, significant flexion of the hip occurred, the load was transferred to the reaching arm, or the elbow of the stable arm was flexed, the test was deemed invalid, and the test was restarted. The evaluation was performed 3 times and the score was obtained by dividing the sum of the 3 repetition distances for each direction by the length of the upper extremity.[12] For UE composite score calculation, this formula was used = (medial+ inferolateral + superolateral) x100 / 3 x arm length.

Lateral Scapular Slide Test (LSST): The LSST was evaluated bilaterally in three different positions: with the arms at the sides in a neutral position, the hands at the waist with the thumbs facing back, and the shoulders in the abduction and the arms in maximum internal rotation. Scapular position measurements were made bilaterally in the same horizontal plane between the lower angle of the scapula and the spinous processes of the thoracic vertebrae in all three test positions.[13]

Statistical Analysis: Data analysis was made with SPSS 25.0 (IBM SPSS Statistics 25, Armonk, NY: IBM Corp.). Continuous variables are presented as mean ± standard deviation, Median (Q1-Q3). Categorical variables are expressed as numbers and percentages. The conformity of the data to the normal distribution was examined with the Shapiro-Wilk test. In the examination of independent group differences, an independent groups t-test was used when parametric test assumptions were met, and when the assumptions were not met, the Mann-Whitney U test was used. The Chi-square analysis was used to analyze the differences between categorical variables. In all analyses, $p<0.05$ was considered statistically significant.

The sample size was calculated with the G-Power 3.1.9.4 program. Assuming that the effect size planned to be reached would be strong (d=0.9) when a total of at least 32 people (at least 16 people for each group) were included in the study, it was calculated that 80% power could be reached at the 95% confidence level. The sample of the study consisted of 4 teams. All 56 athletes in these teams were reached. Meeting the inclusion and exclusion criteria of the study, all athletes who agreed to participate in the study were included in the study (n=49). It was observed that 17 of these athletes were SD-positive, and 36 of them were SD-negative. When the results obtained from these athletes were examined, it was seen that the effect size was strong (d=0.77). At this effect size level, it was calculated that our study reached 81% power at a 95% confidence level.

RESULTS

The demographic information of 49 participants is summarized (Table 1).

SD was positive in 34.7% (n=17) of the participants, and 65.3% (n=32) did not have SD. After the analyses of the SD assessment, the participants were grouped according to their positivity status, and the analyses were completed. Accordingly, modified side plank test scores, dominant YBT-UQ total scores, and non-dominant YBT-UQ total scores of

Table 1. Demographic data.

		Median (Q1-Q3)	
Age (year)		22 (20.5 - 22)	
Height (cm)		182 (172.5 - 188)	
Weight (kg)		71 (59 - 79)	
BMI (kg/m2)		21.43 (19.69 - 22.91)	
Tenure in sports (years)		10.5 (8.75 - 13)	
Gender (n; %)	Female	23	46.9
	Male	26	53.1

Table 2. Comparison of Biering Sorenson and Modified Side Plank, YBT-UQ Test Scores according to SD presence.

	Dyskinesia	No Dyskinesia	p
Biering Sorenson(sec)**	94.9 (53.43 - 153.29)	106.14 (80.98 - 142.1)	0.319
Modified side plank(sec)**	43.59 (35.98 - 62.4)	64.02 (51.69 - 90.08)	**0.015**
YBT-UQ dominant superolateral(cm)*	91.24 ± 13.76	96.72 ± 15.24	0.222
YBT-UQ dominant medial(cm)*	121.94 ± 9.56	120.16 ± 10.57	0.564
YBT-UQ dominant inferolateral(cm)**	103 (92 - 103)	103 (89 - 103)	0.492
YBT-UQ non-dominant superolateral(cm)*	95.12 ± 15.35	99.88 ± 15.76	0.315
YBT-UQ non-dominant medial(cm)*	129.12 ± 4.53	129.66 ± 2.98	0.619
YBT-UQ non-dominant inferolateral(cm)**	100 (97 - 102)	100 (98 - 102)	0.824
YBT-UQ dominant total(cm)*	1.28 ± 0.1	1.35 ± 0.09	**0.029**
YBT-UQ non-dominant total(cm)*	1.35 ± 0.1	1.42 ± 0.08	**0.007**
YBT-UQ Total Difference(cm)**	-0.09 (-0.1 - -0.01)	-0.08 (-0.12 - -0.02)	0.266

Bold means statistically significant; *: Means ± StD. The comparison was made by using the t-test; **: Values are Median (Q1-Q3); Comparison was made by using the Mann Whitney U test.

the participants with positive SD test were found to be significantly lower ($p<0.05$) (Table 2).

DISCUSSION AND CONCLUSION

According to the results of this study, upper extremity athletes with SD had lower balance and core strength than those without SD.

We found a statistically significant difference between the Modified Side Plank Test values, the dominant YBT-UQ total score, and the non-dominant YBT-UQ total score values of individuals with SD.

In a systematic review by Burn et al., it has been stated that the SD presence is higher in athletes who do overhead sports than those who do not.[14] In another study, the highest prevalence of SD was shown in handball players.[15] It has been stated that the presence of SD is two times higher in male kickboxers than in sedentary individuals.[16] Sarı[17] found the rate of SD to be 40 % in 54 athletes playing overhead sports. In our study, the presence of SD was 34.4%. Similar to our study, Koslow et al. reported 26.8% of individuals with SD in at least one of the three positions.[18] However, in the study of Sezik (2018), the rate of SD was higher than that found in the present study.[19] It is thought that this result may be due to the lower age group (15.15 ± 0.4) in their study compared to the present study.

In the evaluation of SD, there are tests such as LSST, scapular assistance test (SAT), scapular retraction test (SRT), lateral scapular slide test (LSST), isometric scapular pinch test, and the wall pushup test.[20] Some researchers use LSST in their studies, similar to ours, because it is reliable and easy to apply in SD assessment.[21,22] However, Jildeh et al. recommend the use of new computational methods through technology-based artificial intelligence for SD evaluation.[20]

We did not find any literature on examining the core strength of SD status in athletes using their upper extremities. A study with handball players by Bauer et al.,[23] looked at the relationship between YBT-UQ and core strength. In this literature, these researchers evaluated the core muscles, which we evaluated with the Biering Sorensen Test, with a component of the Bourban test (Dorsal chain).[23]

In our study, it was found no statistical difference regarding the Biering Sorensen Test score and SD status. The Biering-Sorenson test mostly gives the isometric endurance of the hip and back extensor muscles. It has also been used as a good assessment tool to predict the risk of non-specific low back pain in patients/clients following a study[11] and therefore is thought to be unaffected by SD.

In the Modified Side Plank test, which we used in the assessment of core strength, the activation of local muscles such as M. Quadratus lumborum and the abdominal wall is required.[7] In our study, a statistical difference was observed in the modified side plank test according to the SD status. Modified Side Plank values were found to be lower in individuals with SD. Tawde et al.[24] measured the muscle strength of neck flexors using the folded stabilizer pressure biofeedback unit and analyzed them according to their SD status. A statistical difference was found in the cervical core muscles in terms of the presence of SD in violin players. This study on violin players is the only study we can discuss. It was observed that there is no study in the literature evaluating core muscle strength in SD in the field of sports. In this sense, the present work is unique.

The YBT-UQ has been used in many populations because it is an inexpensive, portable, and easy-to-interpret field test.[25] Scapular stability and mobility, thoracic rotation, and core stability are required to maintain balance while performing the test.[26] Some researchers evaluated the relationship between YBT-LQ and core muscle strength in upper extremity sports.[23,27,28]

Amasay et al.[29] evaluated the relationship between the YBT-UQ and SD in healthy university students. However, no study in the literature evaluated the relationship between the YBT-UQ and SD in upper extremity sports.

Therefore, our study investigated the effect on the YBT-UQ scores of athletes with SD.

In our study, there was a statistical difference between the dominant YBT-UQ and the non-dominant YBT-UQ scores in the presence of SD. The assumption was that athletes with SD would show lower scores in all aspects of the YBT-UQ. In our study, it was also found a statistically significant relationship between core muscles and the YBT-UQ. They must remain in the plank position while performing the YBT-UQ. Again, while performing this test, trunk stabilization should be good to provide extremity mobility.[30] We think that our finding is due to the good YBT-UQ value in patients with strong core muscles. Studies prove the positive relationship between core muscles and the YBT-UQ supporting our conclusion.[23,27,28]

In our study, there are limitations and strengths. The small sample size and the fact that we only evaluated the dominant side in the Modified Side Plank Test are the limitations of our study. The strength of our study is that it is a study that has not been performed in this field and that it includes both sports sciences and health sciences. There are few studies on this subject in the literature. This study is thought to contribute to the literature for future research.

In conclusion, upper extremity strength, which is an absolute factor for success in volleyball and basketball athletes, and upper extremity balance, which is equally important for shot-point production, can be

affected by SD. A well-stabilized shoulder is important for athletes using the upper extremities. When the athletes were examined in the study, it was seen that SD was effective on the athletes as predicted in the hypotheses. For this reason, as a clinical finding, we suggest that SD should be evaluated before and after training since the presence of SD will affect the athletes' core muscle strength and upper extremity balance, thus, their sports performance. In this way, possible injuries will be prevented. Among our recommendations, the suggested benefits of closed kinetic chain upper extremity exercises similar to the YBT-UQ can be added to training for rehabilitation and many sports as they include increased shoulder stability and proprioception.

Ethics Committee Approval: Ethical approval of the study was obtained from Aydın Adnan Menderes University Faculty of Medicine Ethics Committee (Date: 27.04.2020, decision no: 2020/63). No personal information was written on the data collection form to ensure privacy. The research was carried out according to the Helsinki Declaration Principles.

Conflict of Interest: No conflict of interest was declared by the authors.

Author Contributions: Concept – FU, NÖ; Supervision – AK; Materials – NÖ; Data Collection and/ or Processing – EE; Analysis and/ or Interpretation – FÜ, EE; Writing – NÖ, AK.

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The Meaning of Life and Self-Efficacy in Coping with Cancer

Kanserle Başa Çıkmada Özyeterlik ve Yaşamın Anlamı

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ABSTRACT

Objective: This study was performed to determine the relationship between the cancer patients' level of meaning of life and the level of self-efficacy in coping with cancer, and the factors impacting this relation.

Materials and Methods: The sample of this cross-sectional study consisted of 177 adult patients hospitalized in the Medical Oncology Clinic. The data were collected using the Personal Information Form, the Meaning and Purpose in Life Scale (MPLS), and the Cancer Behavior Inventory-Brief Version (CBI-B).

Results: A significant difference was determined between the median scores of MPLS and the CBI-B scale in terms of age, marital status, educational status, income status, and employment status of the patients ($p<0.05$). A statistically positive significant correlation was found between the mean values of MPLS and CBI-B total scores ($p<0.05$).

Conclusion: As the meaning in the lives of cancer patients increases, their self-efficacy levels in coping with cancer increases.

Keywords: Cancer, coping with cancer, self-efficacy

ÖZ

Amaç: Bu çalışma; kanser hastalarının hayatındaki anlam düzeyi ile kanserle başa çıkmada özyeterlik düzeyleri arasındaki ilişkiyi ve etkileyen faktörleri belirlemek amacıyla yapıldı.

Materyal ve Metot: Kesitsel türdeki bu çalışmanın örneklemini Medikal Onkoloji Kliniğinde yatarak tedavi gören, çalışmaya katılmayı kabul eden yetişkin 177 hasta oluşturdu. Veriler Kişisel Bilgi Formu, Hayatın Anlam ve Amacı Ölçeği (MPLS) ve Kanser Davranış Envanteri-Kısa Versiyon (CBI-B) ile toplandı.

Bulgular: Hastaların yaşı, medeni durumları, eğitim durumları, gelir durumları ve çalışma durumlarına göre MPLS ve CBI-B ölçek puan ortancaları arasında istatiksel olarak anlamlı bir fark bulundu ($p<0,05$). MPLS ve CBI-B toplam puan ortalamaları arasında istatistiksel olarak pozitif yönde anlamlı bir ilişki saptandı ($p<0,05$).

Sonuç: Kanser hastalarının hayatlarındaki anlam arttıkça kanserle başa çıkmada özyeterlilik düzeyleri artmaktadır.

Anahtar Kelimeler: Kanser, kanserle başa çıkma, özyeterlik

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INTRODUCTION

Cancer leads to great changes in the lives of individuals and causes them to feel that the coping mechanisms they have used until that time are inadequate. The idea that their future will change, the feeling of inability to control their lives, and the perception of uncertainty will cause them to lose their sense of meaning and experience great challenges in maintaining their sense of purpose. The meaning and purpose in life assist individuals in maintaining their well-being, coping better with the disease, and having a better quality of life.[1,2] The notion of meaning and purpose of life is described in various forms by many theorists. It is stated that individuals who have the expectations they want to realize in life in the face of challenges and agonies are more resistant. At the same time, individuals find meaning in their lives by developing an attitude towards the inevitable suffering.[3] Moadel et al.[4] revealed in their study, which was performed on cancer patients, that 40% of the patients needed to find meaning in life among their existential needs. The fact that cancer patients have a meaning and purpose in life assists them to organize their stressful experiences in life and perceive the disease less negatively.[5] In recent years, the significance of self-efficacy in the cancer management has increased. Cancer patients' self-efficacy in coping with symptoms has been shown to be associated with emotional and social well-being as well as physical symptoms and side effects.[6,7] Moreover, the evidence obtained from the studies of Bandura examining the practices of the self-efficacy theory in oncology also demonstrated that self-efficacy is effective in adapting to cancer, enhancing the personal care of patients, and lessening physical and mental symptoms.[8,9] It is predicted that the destructive factors that occur in the lives of cancer patients will cause individuals to experience more painful emotions, change the meaning and purpose of life by changing life conditions abruptly and rapidly, and ultimately decrease their level of self-efficacy in coping with the disease. The number of studies discussing the meaning of life and self-efficacy levels of cancer patients is very limited in the literature.[4-7]

This study was planned to determine the relationship between the cancer patients' level of meaning of life and the level of self-efficacy in coping with cancer, and the factors impacting this relation.

MATERIALS AND METHODS

Ethics Committee Approval: The study was approved by the Scientific Research Ethics Committee of Medical Faculty at Trakya University (Date: 08.04.2019, decision no:07/17). The study was conducted according to the ethical principles outlined by the World Medical Association's Declaration of Helsinki. After explaining the study's objective, written and verbal consent were obtained from the patients included in the study.

Research Type and Questions: This was a cross-sectional study. The following are research:

1. Is there a correlation between the self-efficacy levels of cancer patients and the meaning of life?
2. What are the factors impacting the self-efficacy levels of cancer patients?
3. What are the factors impacting the meaning of life in cancer patients?

Population and Sample: The population of the study consisted of those in the Medical Oncology Clinic of a university hospital between September and October 2019. For the sample selection, the sample calculation formula with the known population was utilized. A total of 177 adult patients were included in the sampling based on the calculation made at 95% confidence level, 5% tolerance, and 90% power. Patients diagnosed with cancer within less than 1 year were not included in the study.

Personal Information Form: This form consisted of 9 questions, including 7 questions containing the personal information of the patients (age, gender, marital status, educational status, financial situation, employment status, and having chronic diseases), and 2 questions containing variables related to cancer (the type of cancer and treatment).

The Meaning and Purpose in Life Scale (MPLS): This self-administered scale, developed by Aydın et al.[10], was generated to determine the meaning levels of individuals in their lives. This scale, which consists of 17 items and is administered in a 5-point Likert-type, has two sub-dimensions as meaning and purpose of life, the meaninglessness of life, and lack of purpose. Items 4, 8, 10, 13, 14, and 16 are reverse coded in the scale. While the highest score on the scale is 85, the lowest score can be 17. As the score level increase, the level for meaning of life increases. The Cronbach Alpha internal consistency coefficient of this scale is 0.81. In the study, the Cronbach Alpha internal consistency coefficient was determined to be 0.91.

Cancer Behavior Inventory-Brief Version (CBI-B): This inventory, which was developed by Heitzmann et al.[6], was adapted into Turkish by Iyigun et al.[11]. It is a one-dimensioned 12-item measurement tool, which was designed to assess the self-efficacy of cancer patients in coping with the disease. Each item of this 12-item scale is scored between 1 to 9 points. As the score level increases, the higher self-efficacy to cope with the disease increases. The Cronbach alpha coefficient for each sample of this scale, assessed on three sample groups, was determined to be 0.84, 0.84, and 0.88, respectively. In the study, the

Cronbach Alpha internal consistency coefficient was determined to be 0.85.

Statistical Analysis: The software of Statistical Package for Social Science for Windows 21 (SPSS, v. 21.0) was used to perform the statistical analysis of the study. After assessing the distribution normality of the variables using Shapiro-Wilk, percentage and frequency were used for nominal variables, and standard deviation, mean and median values were used for ordinal variables. The Spearman correlation analysis test was used to determine the correlations between variables. The Mann-Whitney U and Kruskal-Wallis tests were used to compare independent variables with total scale scores. The results were considered statistically significant at $p<0.05$.

RESULTS

Whereas no significant difference was determined between the medians of MPLS and CBI-B scale scores, regarding the gender of the patients, the presence of chronic disease, the time of diagnosis, and the type of cancer ($p>0.05$); a significant difference was determined between the groups regarding the age, marital status, educational status, financial situation, and employment status of the patients (Table 1).

The mean score of the patients included in the study was determined as follows; the mean MPLS total score was 69.54±11.93, the median value of it was 71.00 and mean of CBI-B total score was 81.42±15.53, and the median value of it was 84.00 (Table 2).

Based on the performed Spearman Correlation analysis in Table 3, a moderately significant positive correlation was determined between the patients' MPLS and CBI-B total scores (r:0.598, $p<0.001$).

Table 1. Comparison of participants' personal characteristics with MPLS and CBI-B (n=177).

Variable		MPLS Total		CBI-B	
	Mean±SD	r	p	r	p
Age	60.15±13.31	-0.238	0.001	-0.172	0.022
	n (%)	**Median (Q1-Q3)**		**Median (Q1-Q3)**	
Gender					
Female	88 (49.7)	71.00 (62.50-81.75)		86.50 (7.00-96.00)	
Male	89 (50.3)	70.00 (60.00-79.00)		82.00 (68.50-91.00)	
		Z=4.306 p=0.251		Z=4.584 p=0.050	
Marital status					
Single	17 (9.6)	70.00 (53.50-73.50)		82.00 (72.00-93.00)	
Married	160 (90.4)	71.00 (61.25-81.00)		84.00 (74.00-94.00)	
		Z=1.105 p=0.042		Z=1.332 p=0.031	
Education status					
Illiterate	18 (10.2)	65.00 (55.75-72.25)		76.50 (68.25-90.75)	
Primary School	109 (61.5)	70.00 (61.00-79.75)		79.71 (69.00-93.00)	
High school and above	50 (28.3)	76.00 (68.00-82.00)		89.00 (82.00-96.00)	
		X^2=10.079 p=0.06		X^2=8.178 p=0.017	
Financial situation					
Poor	14 (7.9)	58.50 (46.00-61.00)		70.50 (55.00-85.25)	
Medium	138 (78.0)	71.00 (62.00-81.00)		84.00 (72.00-93.00)	
Good	25 (14.1)	71.00 (65.50-78.50)		90.00 (79.50-96.00)	
		X^2=14.735 p=0.001		X^2=7.878 p=0.019	
Employment status					
Employed	27 (15.3)	77.00 (66.00-83.00)		93.00 (79.00-97.00)	
Unemployed	150 (84.7)	70.00 (61.00-79.00)		82.00 (69.75-90.00)	
		Z=1.498 p=0.031		Z=1.338 p=0.005	
Chronic disease status					
Yes	97 (54.8)	70.00 (60.50-79.50)		82.00 (69.00-94.50)	
No	80 (45.2)	71.00 (62.00-81.00)		87.00 (73.25-93.75)	
		Z=3.672 p=0.540		Z=3.478 p=0.236	
Cancer type					
Lungs	46 (26.0)	70.00 (60.00-79.00)		79.50 (72.00-91.50)	
Breast	48 (27.1)	71.00 (64.50-82.00)		89.50 (73.00-97.00)	
Gynecological	9 (5.1)	82.00 (67.50-85.00)		86.00 (79.50-95.50)	
Gastrointestinal	44 (24.9)	70.00 (61.00-77.75)		84.00 (63.00-93.00)	
Other (urinary system etc.)	30 (16.9)	69.00 (56.75-79.00)		81.00 (62.25-89.50)	
		X^2=5.577 p=0.233		X^2=7.478 p=0.113	
Time of Diagnosis					
1-5 years	157 (88.7)	71.00 (61.00-81.00)		88.00 (81.50-95.50)	
6-10 years	10 (5.6)	67.50 (64.25-74.75)		81.00 (61.50-91.25)	
11 years and above	10 (5.6)	67.50 (55.25-74.00)		84.00 (72.00-95.00)	
		X^2=1.598 p=0.450		X^2=1.578 p=0.454	

SD: Standard deviation; Z=Whitney U test; X^2=Kruskal Wallis test.

Table 2. Distribution of participants' MPLS and CBI-B median and mean scores.

	Median (Q1-Q3)	Mode	Mean±SD	Min-Max
Meaning and purpose of life sub-dimension	47.00 (42.00-52.00)	55.00	46.52±7.14	11-55
Meaninglessness of life and lack of purpose sub-dimension	24.00 (19.00-28.00)	30.00	23.02±5.74	6-30
MPLS Total	71.00 (61.00-80.00)	85.00	69.54±11.93	17-85
CBI-B Total	84.00 (72.00-94.00)	89.00	81.42±15.53	12-108

MPLS: The Meaning and Purpose in Life Scale; CBI-B: Cancer Behavior Inventory-Brief Version; SD: Standard deviation; Min.: Minimum; Max.: Maximum.

Table 3. The relationship between MPLS and CBI-B.

		CBI-B Total
MPLS Total	r	0.598*
	p	0.000

MPLS: The Meaning and Purpose in Life Scale; *: Spearman correlation test p<0.001.

DISCUSSION AND CONCLUSION

How cancer patients cope with the destructive factors that occur during the diagnosis and treatment stages and how they make sense of life are among the increasingly important issues in recent studies.[12,13] Hence, this study was designed to determine the correlation between cancer patients' meaning in their lives and their self-efficacy level in coping with cancer and the factors impacting them.

A positive and significant correlation was determined between the ages of the patients included in the study and the mean score of MPLS and CBI-B. Aftab et al.[14] revealed that individuals' life meaning resources were lost due to reasons such as the health problems of individuals experienced after the age of sixty, the change in their social life following retirement, the loss of a family or loved one, and that elderly individuals are in search of a meaning in life. Moreover, Serpentini et al.[15] found in their study, which was performed on cancer patients in palliative care, that patients aged older than 62 years stated a higher self-efficacy level than younger patients. Considering the findings, which support the result of the study, as the age increases, the meaning of life of the patients with cancer and their self-efficacy to cope with cancer also increase. The potential for coping with problems increases with the increasing experience against the challenges faced in life as the age gets older.

While it was determined that the median of MPLS and CBI-B total scale score was higher in female patients who were included in the study compared to male patients, and the mentioned median scores were higher among patients without any other chronic disease than patients with another chronic disease, and there was no significant difference between the groups. Similar to the results of the studies performed by Erci,[16] Gravier et al.,[17] and Tomás-Sábado et al.,[18] it was found that there is no significant difference between the sex of cancer patients and the mean of MPLS. Regardless of sex, all diseases trigger more or less fear of death in individuals. This fear causes patients to experience an internal conflict in the face of their desire to recover and continue their lives. It can be suggested that having other long-term health problems apart from cancer might adversely impact the meaning of life and coping with the disease in individuals by inducing internal conflict.

It was determined that the median of the total scale scores of the MPLS and CBI-B were statistically higher in married patients included in the study compared to single patients, and it was higher in patients who are at least high school graduates compared to illiterate and primary school graduates. In the study, it is estimated that as married individuals have more roles in life than single individuals, they would have more desire to achieve the meaning and goals of life, and it is considered that the social support, which married cancer patients receive from their environment, and meaningful relationships would also enhance their self-efficacy in coping with the disease. Gravier et al.[17] found out that cancer patients' having a high education level increase the meaning of life in these patients. This finding is in line with the results of our study. It is considered that education would increase the self-efficacy in coping by helping individuals to understand better their emotions, thoughts, behaviors and life experiences, and the process of self-recognition.

In the study, it was determined that the median of the MPLS and CBI-B total scale scores were significantly higher in the patients with good income compared to the patients with middle and poor income and in the working patients compared to the patients who did not work. It is well-known that patients

experience financial difficulties during the long-term illness period that begins with a cancer diagnosis. While it is suggested that financial difficulties negatively affect the self-efficacy of patients,[19] it can be stated that this situation might impact the meaning and purpose of life as well.

In the study, no significant difference was determined between the groups in terms of the type of disease and the duration of the disease. It was determined that those with the first 5 years of their illness had higher mean MPLS and CBI-B total scale scores. Mystakidou et al.[20] stated that the perceived general self-efficacy of patients receiving radiotherapy decreased with the progression of the disease. The results of the study are in line with the literature. The fact that the cancer diagnosis period is over five years suggests that the disease recurs after a long time, as a result, it can be stated that the life purpose resources of the patients might have changed, and their self-efficacy might be affected adversely.

In the study, a positive and significant correlation was found between the patients' level of meaning in life and their self-efficacy in coping with cancer. As the meaning in patients' lives increases, the level of self-efficacy increases as well. Winger et al.[21] stated that the meaning of life in cancer patients provides support at various stages of coping with the disease and plays a crucial role in the adaptation process.

In conclusion, it was determined that as the meaning in the lives of cancer patients increased, their self-efficacy in coping with cancer also increased. Moreover, it was determined that the meaning of life and self-efficacy level of cancer patients were affected by factors such as age, marital status, educational status, comorbidity of another chronic disease, and income status. In this regard, it is suggested that nurses should counsel patients with cancer to participate in psychotherapies and psychosocial support programs such as Logotherapy, known as meaning therapy for cancer patients. Furthermore, it is suggested that nurses working in the field should consider variables such as age, marital status, and the presence of any comorbid chronic disease when planning psychosocial support interventions in their care.

Ethics Committee Approval: The study was approved by the Scientific Research Ethics Committee of Medical Faculty at Trakya University (Date: 08.04.2019, decision no:07/17). The study was conducted according to the ethical principles outlined by the World Medical Association's Declaration of Helsinki. After explaining the objective of the study, the written and verbal consents were obtained from the patients included in the study.

Conflict of Interest: No conflict of interest was declared by the authors.

Author Contributions: Concept- NAS, SK; Supervision- NAS; Materials- NAS, SK; Data collection and/or processing- NAS, SK; Analysis and/or interpretation-NAS, SK; Writing-NAS, SK.

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Psychotherapy Training in Psychiatry Residency: Insights from Türkiye

Psikiyatri İhtisasında Psikoterapinin Yeri: Türkiye'den Bir Sunum

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ABSTRACT

Objective: This study aimed to investigate the psychotherapy training experiences of psychiatry residents through a questionnaire, addressing the knowledge gap on standards and practices during psychiatry residency training in Türkiye.

Materials and Methods: The study was conducted via WhatsApp and e-mail groups specific to psychiatry residents in Türkiye.

Results: In our study, 80.5% of psychiatry residents received psychotherapy training during their residency, whereas, especially in those who have been in residence for four years or more, 97% received theoretical training, and 68% received supervision training. Moreover, a substantial portion (90.3%) of residents expressed plans to pursue psychotherapy training after graduation. Of those who received training, 63.7% obtained it from their educational institution, while 89.0% obtained it from other centres. Furthermore, 47.8% of the psychotherapy training was provided by in-house faculty members. Cognitive Behavioral Therapy was the most preferred type of psychotherapy among the residents. The most commonly reported barrier to accessing psychotherapy training was its high cost.

Conclusion: The study concluded that most psychiatry residents in Türkiye received psychotherapy training. Enhancing psychotherapy training in psychiatry residency, overcoming barriers, and improving supervision are critical issues to be addressed.

Keywords: Medical, psychotherapy, residency, training

ÖZ

Amaç: Bu çalışma, Türkiye'de psikiyatri asistanlığı eğitimi sırasında standartlar ve uygulamalar konusundaki bilgi eksikliğini ele alan bir anket aracılığıyla psikiyatri asistanlarının psikoterapi eğitim deneyimlerini araştırmayı amaçlamıştır.

Materyal ve Metot: Çalışma, Türkiye'deki psikiyatri asistanlarına özel WhatsApp ve e-posta grupları aracılığıyla gerçekleştirilmiştir.

Bulgular: Çalışmamızda psikiyatri asistanlarının %80,5'i asistanlığı süresince psikoterapi eğitimi alırken, özellikle dört yıl ve üzeri asistanlık yapanların %97'si teorik, %68'i süpervizyon eğitimi almıştır. Ayrıca, asistanların önemli bir kısmı (%90,3) mezun olduktan sonra psikoterapi eğitimi almayı planladığını ifade etmiştir. Eğitim alanların % 63,7'si eğitim aldığı kurumdan, %89,0'ı ise diğer merkezlerden almıştır. Ayrıca psikoterapi eğitiminin %47,8'i kurum içi öğretim üyeleri tarafından verilmiştir. Asistanlar arasında en çok tercih edilen psikoterapi türü Bilişsel Davranışçı Terapi oldu. Psikoterapi eğitimine erişimde en yaygın olarak bildirilen engel, yüksek maliyetiydi.

Sonuç: Çalışma, Türkiye'deki psikiyatri asistanlarının çoğunun psikoterapi eğitimi aldığı sonucuna varmıştır. Psikiyatri asistanlığında psikoterapi eğitiminin arttırılması, engellerin aşılması ve süpervizyonun iyileştirilmesi ele alınması gereken kritik konulardır.

Anahtar Kelimeler: Eğitim, psikoterapi, tıp, uzmanlık

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INTRODUCTION

Psychotherapy has gained popularity and significance in recent years, prompting questions about competence and training.[1] Recognized as a crucial priority in psychiatry education, psychotherapy training is expected to equip psychiatric residents with competence in effective practices.[2] Training institutions are expected to follow the curriculum and provide practical education in psychotherapy to residents as part of their psychiatry residency programs.[3]

Although there are many different methods in psychotherapy training, the most commonly used method is practical application counselling (supervision) and theoretical training.[1] The content, method, and duration of the theoretical training, the difference in the application methods in different occupational groups, and the certificates obtained at the end of the training are controversial issues in Türkiye and the world. Official committees and curricula that evaluate psychotherapy training and competence in the USA, Europe, and Türkiye determine the minimum standards.[4,5] On the other hand, private institutions provide education within the framework of their curricula and, even more recently, through online education.[1,6] In addition to the adequacy of the educational practices provided by official institutions, the content and methods offered by the increasing number of private education centres also lead to debates among experts in the field.

There are significant differences in psychotherapy training in psychiatry residency across Europe. Further documentation and standardisation of the curriculum are recommended.[6,7]

Psychotherapy training standardisation is crucial both globally and in Türkiye.[4] According to a joint study by the World Health Organization (WHO) and the World Psychiatric Association (WPA), significant disparities exist in psychotherapy training worldwide, including differences in educational opportunities, content and quality.[8] The standards for psychotherapy training in Türkiye are set by the "Medical Residency Board Curriculum Establishment and Standard Setting System (MRBCES)" regulations, updated in 2017 and 2020. These standards include requirements such as providing 60-80 hours of theoretical training and at least one hour per week of theoretical training on either psychodynamic or cognitive-behavioral theories. Additionally, residents are expected to develop psychotherapeutic interviewing skills and provide long-term (at least 40 sessions) psychotherapy to at least one patient and short-term (12-16 sessions) psychotherapy to at least five patients. Furthermore, psychotherapy supervision is mandated to be at least 100 hours in a semi-individual format.[9]

Although there are studies on psychotherapy training in Türkiye,[10,11] data on psychotherapy training standards and their implementation in the residency training process are limited. The current study aims to investigate residents' experiences in psychotherapy training through a questionnaire and to document the situation in Türkiye.

MATERIALS AND METHODS

Ethics Committee Approval: The study received approval from the ethics committee of Sakarya University Faculty of Medicine. All stages of the study were carried out in accordance with the ethics committee statement (Date: 27.01.2020, decision no: 71522473/050.01.04/20), and the Declaration of Helsinki.

Study Design and Data Collection: Between April and December 2020, an online questionnaire was distributed to psychiatry residents in Türkiye who volunteered to participate in this study. The questionnaire was sent to WhatsApp and e-mail groups with almost 1,000 members, comprising psychiatry residents nationwide. Informed consent was obtained from all participants.

A 40-item questionnaire was prepared for the study, which included questions about the sociodemographic data of the participants and the psychotherapy training they received during their psychiatry residency. While preparing the questions, support was received from previous similar studies[12-14] and the MRBCES.[9] The word 'observation' in the questions meant direct observation of the practices of both the assistant and the supervisor and/or co-therapist. Two reminders were sent to all groups, and the study was completed in December 2020 with the participation of 114 residents.

Statistical Analysis: The data obtained from the research were analysed using the SPSS 21.0 software package and Microsoft Office Excel. The Kolmogorov-Smirnov test assessed the normality of the data. Frequency analysis determined the number of occurrences (frequency) and percentages. Descriptive statistics, including rates for categorical variables and mean and standard deviation for normally distributed data, were used for data presentation.

RESULTS

A total of 113 residents, 75 females (66.4%) and 38 males (33.6%), participated in the study. The mean age was 29.23 ± 2.60 (25 to 38 years). Among the participants, 33.6% (n = 38) worked in a training and research hospital, while 66.4% (n = 75) worked in a university hospital. Of the residents, 80.5% (n = 91) reported receiving psychotherapy training during their residency training. This rate was 91.2% for the residents with three years or more experience,

97.6% for those with four years or more experience, and 100% for residents who have completed five years (n = 6). It was determined that 62.6% (n = 57) of the participants received psychotherapy supervision training during their residency. This rate was 67.7% for residents with three years or more of experience and 68.2% for residents with four years or more of experience. Information on the characteristics of the participants and the psychotherapy training they received during their residency was presented in Table 1.

Table 1. Characteristics of participants and information on psychotherapy training during residency.

Characteristics of Participants		**n (%)**
Gender	Female	75 (66.4)
	Male	38 (33.6)
What year of residency training?	1	18 (15.9)
	2	27 (23.9)
	3	26 (23.0)
	4	36 (31.9)
	5	6 (5.3)
In which region do you receive your residency training?	The Marmara Region	45 (39.8)
	The Mediterranean Region	14 (12.4)
	The Central Anatolia Region	20 (17.7)
	The Black Sea Region	12 (10.6)
	The Eastern Anatolia Region	13 (11.5)
	The Aegean Region	7 (6.2)
	The Southeast Anatolia Region	2 (1.8)
Did you/do you receive any psychotherapy training during your residency training?	Yes	91 (80.5)
	No	22 (19.5)
Did you/do you receive any psychotherapy supervision training during your residency training?	Yes	57 (62.6)
	No	34 (37.4)
Did you/do you receive psychotherapy training at the institution where you received residency training?	Yes	58 (63.7)
	No	33 (36.3)
What type of psychotherapy training have you received/are you receiving? (You can tick more than one option)	Cognitive Behavioural Therapy (Any)	76 (67.3)
	Classical Cognitive Behavioural Therapy	72 (63.7)
	Acceptance and Commitment Therapy	15 (13.3)
	Metacognitive Therapy	8 (7.1)
	Schema Therapy	8 (7.1)
	Supportive Therapy	25 (22.1)
	Sex Therapy	20 (17.7)
	Psychodynamic Psychotherapy	18 (15.9)
	Couple and Family Therapy	3 (2.7)
	Brief Psychotherapy	2 (1.8)
How do you receive psychotherapy supervision training (in your institution or outside the institution)? (You can tick more than one option)	Oral consultation	41 (36.28)
	Audio recordings	25 (22.12)
	Written records	23 (20.35)
	Observation	10 (8.85)
	Video recordings	8 (7.08)
How many hours of theoretical psychotherapy training are provided in the institution where you receive residency training until graduation?	0-50	13 (22.8)
	50-100	17 (29.8)
	100-200	6 (10.5)
	200-400	17 (29.8)
	400 or more	4 (7.0)
How many hours of theoretical psychotherapy training did you receive in total in the institution where you received residency training?	0-50	28 (48.3)
	50-100	12 (20.7)
	100-200	12 (20.7)
	200-400	4 (6.9)
	400 or more	2 (3.4)
How many hours of psychotherapy supervision training are provided in the institution where you receive residency training until graduation?	0-50	7 (21.2)
	50-100	6 (18.2)
	100-200	12 (36.4)
	200-400	6 (18.2)
	400 or more	2 (6.1)
How many hours of psychotherapy supervision training did you receive in total in the institution where you received residency training?	0-50	13 (39.4)
	50-100	7 (21.2)
	100-200	11 (33.3)
	200-400	2 (6.1)
	400 or more	0 (0.0)
The psychotherapy training you received at the institution where you receive residency training… (You can tick more than one option)	Training is provided by faculty members of the institution	54 (47.8)
	External guest trainers provide training	23 (20.4)
	Association-supported training is provided	6 (5.3)

Sixty-three point seven per cent of the residents reported receiving psychotherapy training at the institution where they underwent psychiatry residency training. Among the institutions, 47.8% provided psychotherapy training through their faculty members, 20.4% invited guest trainers from outside, and 5.3% offered association-supported training. Furthermore, 56.8% of the residents reported receiving psychotherapy supervision within their institution. Most theoretical education and supervision occurred through weekly course hours at the institution (Table 2). Regarding training outside the institution, 89.0% (n = 81) of the residents received theoretical training in psychotherapy from external sources, and 56.8% (n = 46) received supervision outside the institution. It was observed that theoretical training and supervision in psychotherapy mostly took place in the form of monthly training or package modules in private institutions. The details of psychotherapy training received by residents during their psychiatry residency, both within and outside the institution, are presented in Table 2.

Table 2. Responses related to training in and outside the institution providing residency training.

Question	Answer	In the institution n (%)	Outside n (%)
Are you training in psychotherapy?	Yes	58 (63.7)	81 (89.0)
	No	33 (36.3)	10 (11.0)
Are you training in psychotherapy supervision?	Yes	33 (56.9)	46 (56.8)
	No	25 (43.1)	35 (43.2)
What is the frequency of psychotherapy theoretical training?	Weekly	37 (32.7)	5 (4.4)
	Less than once a month at irregular intervals	12 (10.6)	9 (8.0)
	The package is in modules	10 (8.9)	29 (25.7)
	With monthly/monthly psychotherapy unit rotation	5 (4.4)	37 (32.7)
What is the frequency of psychotherapy supervision training?	Weekly	18 (15.9)	5 (4.4)
	Less than once a month at irregular intervals	8 (7.1)	6 (5.3)
	The package is in modules	4 (3.5)	18 (15.9)
	With monthly/monthly psychotherapy unit rotation	4 (3.5)	18 (15.9)
How do you receive psychotherapy supervision training?	Oral consultation	28 (24.8)	24 (21.2)
	Written record	13 (11.5)	23 (20.4)
	Sound recording	9 (8.0)	22 (19.5)
	Video recording	6 (5.3)	6 (5.3)
	Observation	5 (4.4)	3 (2.7)

During residency training, 51.8% of the residents reported applying structured psychotherapy. However, only 11.5% felt fully competent in applying psychotherapy, while 58.4% felt partially competent. Despite this, 85.7% of the residents evaluated psychotherapy as an effective method. Table 3 presents the evaluations of the residents and their instructors in their institution.

Table 3. Responses related to psychotherapy practice, effectiveness, competence.

Question	Answer	n (%)
Do you apply/have you applied structured psychotherapy during your residency training?	Yes	58 (51.8)
	No	54 (48.2)
How many clients have you provided long-term (at least 40 sessions) psychotherapy?	0	28 (47.5)
	1-2	19 (32.2)
	3-4	7 (11.9)
	5 or more	5 (8.5)
How many clients have you provided short-term (12-16 sessions) psychotherapy?	0	11 (18.6)
	1-4	25 (42.4)
	5-8	9 (15.3)
	9 or more	14 (23.7)
Do you think psychotherapy is an effective method?	Yes	96 (85.7)
	Partially	16 (14.3)
Do you think you are competent in applying psychotherapy?	Yes	13 (11.5)
	No	34 (30.1)
	Partially	66 (58.4)
Do you think that the psychotherapy training you received at the institution where you received your residency training will provide you with the competence to apply structured psychotherapy in the future?	Yes	23 (20.5)
	No	39 (34.8)
	Partially	50 (44.6)

Table 3. Continue.

Do you think you need structured psychotherapy training outside the institution where you received your residency training?	Yes	100 (88.5)
	No	1 (0.9)
	Partially	12 (10.6)
Do you think that your trainers are competent in psychotherapy training in the institution where you receive residency training?	Yes	35(31.0)
	No	26 (23.0)
	Partially	52 (46.0)
Do you think that your trainers adequately supervise your psychotherapy competence in the institution where you receive residency training?	Yes	20 (17.7)
	No	56 (49.6)
	Partially	37 (32.7)
During your residency training. Do you use psychotherapy elements in your outpatient clinic meetings?	Yes	45 (39.8)
	No	13 (11.5)
	Partially	55 (48.7)
Do you plan to continue structured psychotherapy training after your graduation?	Yes	102 (90.3)
	No	0 (0.0)
	Partially	11 (9.7)

To the question 'In which school/schools should psychotherapy training be compulsory in a medical residency training centre?', 99.1% of the residents answered Cognitive Behavioural Therapy (CBT). When asked which therapy school they feel closer to, 75.2% answered CBT. The residents' opinions about the psychotherapy schools are presented in Table 4.

When the barriers to access to psychotherapy training were evaluated, the most critical problem was found to be the high cost of training (84.9%). Problems related to residents' access to psychotherapy training are shown in Table 5.

Table 4. Views on psychotherapy schools.

Question	Answer	n (%)
In which school(s) should psychotherapy training be compulsory in a medical residency training center? (You can tick more than one option)	Cognitive Behavioural Therapy (Any)	112 (99.1)
	Classical Cognitive Behavioural Therapy	107 (94.7)
	Schema Therapy	24 (21.2)
	Acceptance and Commitment Therapy	16 (14.2)
	Mindfulness	16 (14.2)
	Metacognitive Therapy	12 (10.6)
	Supportive Therapy	74 (65.5)
	Sex Therapy	62 (54.9)
	Psychodynamic Psychotherapy	38 (33.6)
	Brief Psychotherapy	34 (30.1)
	Couple and Family Therapy	33 (29.2)
	Group Therapy	30 (26.6)
	EMDR	28 (24.8)
	Interpersonal Relations Psychotherapy	24 (21.2)
	Integrative Psychotherapy	10 (8.9)
	Solution Focused Therapy	9 (8.0)
	Existential Therapy	9 (8.0)
	Hypnotherapy	9 (8.0)
	Transference-Focused Psychotherapy	3 (2.7)
	Transactional Analysis	2 (1.8)
	None	1 (0.9)
Which therapy school do you feel closer to? (You can tick more than one option)	Cognitive Behavioural Therapy (Any)	85 (75.2)
	Classical Cognitive Behavioural Therapy	69 (61.1)
	Acceptance and Commitment Therapy	19 (16.8)
	Mindfulness	19 (16.8)
	Schema Therapy	17 (15.0)
	Metacognitive Therapy	7 (6.2)
	Supportive Therapy	43 (38.1)
	Sex Therapy	32 (28.3)
	Psychodynamic Psychotherapy	25 (22.1)
	EMDR	24 (21.2)
	Interpersonal Relations Psychotherapy	10 (8.9)
	Couple and Family Therapy	10 (8.9)
	Existential Therapy	10 (8.9)
	Hypnotherapy	7 (6.2)
	Group Therapy	6 (5.3)
	Brief Psychotherapy	5 (4.4)
	Solution Focused Therapy	5 (4.4)
	Transference-Focused Psychotherapy	5 (4.4)
	Integrative Psychotherapy	4 (3.5)
	None	2 (1.8)
	Transactional Analysis	1 (0.9)

Table 5. Access to psychotherapy training and online training.

Question	Answer	n (%)
What barriers did you experience in accessing psychotherapy training? (You can tick more than one option)	High price	96 (85.0)
	Time constraints	74 (65.5)
	Transportation difficulties	65 (57.5)
	Few training options in the region	55 (48.7)
	Lack of training options in the region	34 (30.1)
	Too many training options	25 (22.1)
	Institutional trainers do not support psychotherapy training	22 (19.5)
	I am not experiencing any difficulties	2 (1.8)
Do/have you received any psychotherapy training online at an institution other than the institution where you received your residency training?	Yes	11 (12.1)
	No	80 (87.9)

DISCUSSION AND CONCLUSION

Psychotherapy practices are one of the essential areas of psychiatry, and in this study, residents receiving psychiatry residency training were asked about psychotherapy through an online questionnaire. Eighty per cent of the residents reported that they had received theoretical psychotherapy training. In addition, almost all the residents who have been in residency training for four years or more received theoretical psychotherapy training. Our results are compatible with studies conducted in other countries.[15,16]

The gold standard in psychotherapy training involves clinical practice under supervision, complementing theoretical education with one-on-one relationships.[1] In addition to treating patients, psychiatrists' psychotherapy skills can be invaluable in providing supportive and empathetic care to patient relatives, offering corrective experiences, and understanding the theories underlying individual, group, and family psychotherapies for mental disorders.[17] Furthermore, psychotherapy training equips psychiatrists with proficiency in oral and written examinations, evidence-based discussion skills, and the ability to practice psychotherapy safely and effectively.[1] Rapidly advancing developments in neuroscience and other fields of medicine have increased the intensity of the subjects intended to be known in psychiatry education. Similarly, developments in psychotherapy have also increased the time required for psychotherapy training. Despite this, the psychiatrists' time spent on psychotherapy training and psychotherapy practices has gradually decreased. However, there is evidence that psychotherapy practice by the same therapist provides additional benefits, and psychotherapy training still occupies an important place in psychiatry education and clinical practice.[18,19]

In this context, a comprehensive literature search to identify the diversity of psychotherapy training in Europe has found significant variation in psychotherapy training practices; therefore, standardisation is required.[4] Another study has reported that the most problematic areas in the psychotherapy training of psychiatrists in Europe are the need for mentoring for trainees, the variability of approaches to ensure training quality, and the assessment of training outcomes.

In a study investigating the status of cognitive therapy in Türkiye and The European Federation of Psychiatric Trainees (EFPT) member countries, 78.5% of residents and specialist psychiatrists in Türkiye have reported that they involve in psychotherapy. This rate was higher in EFPT members (92.6%) than in Türkiye.[10]

Approximately 64% of the residents stated that they also received psychotherapy training in the institution where they received a psychiatry residency. In contrast, in a study of 79 psychiatry residency programs in the US, it has been reported that 22% have a psychotherapy course, 4% are developing a psychotherapy course, and 74% do not offer a psychotherapy course.[5]

The training received from external centres is provided by training institutions and private centres worldwide, as in Türkiye. For example, in the USA, psychotherapy training and assessments are supported by the American Association of Directors of Psychiatric Residency Training (AADPRT) Psychotherapy Committee and the AADPRT Virtual Training Office (VTO).[20] In addition to the Turkish Psychiatric Association, many internationally accredited organisations provide psychotherapy training in Türkiye. In this study, the training rate in an external center for any psychotherapy training was 89% and 56.8% for supervision. The fact that centres other than official institutions take place in psychotherapy training makes it necessary to explore the content, adequacy, and supervision of this training. In addition, these findings show that psychotherapy training varies significantly between countries and requires international cooperation for its standardisation.

The use of movies and videos in psychotherapy has been known and utilised for a long time.[21] While it is the most optimal method for the supervisor and the therapist to see a case together in psychotherapy

supervision, watching video recordings, listening to audio recordings, and reading written records are also acceptable methods.[1]

However, despite the need for a standard, structured practice in psychotherapy supervision, it is unfortunately seen that there needs to be more supervision in clinical practice. A Canadian survey study has shown that few programs regularly use direct observation during supervision, essential for learning and teaching techniques.[22]

A few decades ago, only 10% of supervisors used audio or video,[1] but now using webcam, internet, and video technology alternatives and digitalisation has become standard new options for supervision.[23] However, there is still a need for standardisation and documentation of rules and structure in education and sessions. For instance, in a survey study that included adult psychiatry programs approved by the Accreditation Council for Graduate Medical Education (ACGME), most programs (78.1%) reported having clear resident supervision guidelines. Still, only a few programs (17.2%) required residents to document that they received these guidelines.[24]

In this study, the most frequently used practice in psychotherapy supervision was determined to be verbal counselling. Video and audio recordings were among the methods used in evaluations, and the participation rate in the sessions as an observer was 8%. In fact, evidence-based training programs are now necessary for psychotherapy training, from school selection to supervision processes.[25,26] In practice, it is hoped that educational institutions will improve themselves and increase these rates.

The Accreditation Council for Graduate Medical Education (ACGME) has identified cognitive behavioral therapy, supportive therapy, and psychodynamic psychotherapy as core modalities for psychotherapy training in psychiatry residency programs.[27] In this study, it was determined that the most trained and preferred psychotherapy model was CBT. Some studies have also reported that the most used method by psychiatrists is supportive psychotherapy.[28] However, it is stated that the most trained psychotherapy school is CBT. At this point, the fact that CBT has come a long way in evidence-based practices compared to other psychotherapy schools may be due to the advantage of its ease of application and training.

Qualifications in psychotherapy must meet the criteria of 'need' (in terms of a population burden of disease) and 'applicability' (i.e., skills must be applicable in multiple settings). These criteria are currently applied in CBT and psychodynamic therapy taught during residency training in Canada.[29] More than half of residency training program directors in the United States indicated that CBT, Parent Skills Training, psychodynamic psychotherapy, and family therapy should be taught to the point of competence or expertise.[12] Given the lack of standardisation in psychotherapy training in Türkiye, a model focused on teaching "psychotherapy skills" can be proposed.

In this study, the most critical barriers to accessing psychotherapy training were stated to be its high cost, time constraints, and transportation difficulties. All these difficulties are related to receiving training outside the institution. Considering that institutions cannot provide the education of all schools together, it is unavoidable to resort to additional training outside the institution when necessary in a wide field such as psychotherapy. However, the standardisation and improvement of training within the institution can help reduce the need for training outside the institution. On the other hand, it is a controversial issue whether the most crucial factor regarding participation in psychotherapy education is cost or incentive. Evidence from recent studies reported no difference in participation in training activities between incentivised and non-incentivized groups.[30]

The fact that the psychiatry faculty members in the institution did not support psychotherapy training was stated as one of the barriers to receiving psychotherapy training, with a frequency of 19.5% in this study. A study in the US investigating residency programs has reported that 20% of programs consider department attitude towards psychotherapy as a barrier, including one response that claimed that psychotherapy training was not appropriate for psychiatry residency training in this century.[5]

Recent years have seen discussions regarding the status of psychotherapy training in psychiatry taking place in Türkiye and other countries.[13,25] The present study obtained much better results than previous years, showing that psychotherapy training in psychiatry residency has come a long way.[6,14] Nevertheless, it is evident that additional training (especially in the form of supervision) and the establishment of more therapy programs within the institution are necessary. An integrative approach in psychotherapies may help achieve the deserved place of therapies and increase the quality of psychotherapy training. Thus, the basic mechanisms of many practices of different psychotherapy schools, from severe patient groups to personality disorders, from brief interventions for symptomatic and crisis resolution to comprehensive psychotherapy approaches, can be taught to residents during psychiatry training. It is vital that institutions make room for psychotherapy in their curricula, adapt clinical conditions and allocate sufficient time to education.

Our study includes some limitations. First, the small number of participants is the main limitation. However, the survey was sent to many WhatsApp groups, with a total of close to 1,000 people. Second, the survey was conducted online due to transportation restrictions and the Covid-19 pandemic.

Third, using self-report in assessing therapist competence is also a limitation. It has been emphasised in previous studies that the tendency of untrained therapists to exaggerate should be taken into account.[30]

In conclusion, psychotherapy training has an essential place in psychiatry residency in Türkiye. Residents can receive psychotherapy training in their institutions and external centres and develop their psychotherapy skills. However, the development and standardisation of institutional training, the competence of trainers, the need for external centres, and the barriers to accessing psychotherapy training are issues still to be discussed. The results of this study reveal the necessity of further research at the national and international levels for the development and standardisation of psychotherapy education. Future studies should focus on using objective therapeutic competency and effectiveness measures, such as independent or supervisory rating scales and milestones.

Ethics Committee Approval: This study was approved by the Sakarya University Local Ethics Committee (Date: 27.01.2020, decision no: 71522473/050.01.04/20).

Conflict of Interest: No conflict of interest was declared by the authors.

Author Contributions: Concept – EY; Supervision- ABY; Materials – ETM; Data collection and/or processing - ETM, EY, YSO; Analysis and/or interpretation – EY, ABY, EMK; Writing – EY, YSO, EMK, ABY.

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Synthesis and Antibacterial Activity of Some Aryloxyacetic Acid Derivatives Containing Aryl Sulfonate Moiety

Aril Sülfonat Parçası İçeren Bazı Ariloksiasetik Asit Türevlerinin Sentezi ve Antibakteriyel Aktivitesi

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ABSTRACT

Objective: Today, the development of antibiotic resistance is increasing rapidly. This makes it necessary to discover new antibiotics; therefore, this research aims to find new antibacterial agents.

Materials and Methods: Structures of the newly synthesised compounds (4a-d, 5a-d) were elucidated by elemental analyses and spectroscopic data. Their *in vitro* antibacterial activities were tested using a micro-dilution technique against *Escherichia coli, Pseudomonas aeruginosa*, *Staphylococcus aureus,* methicillin-resistant *Staphylococcus aureus*, and *Enterococcus faecalis.* Ciprofloxacin was used as the control drug in this study, which was carried out in accordance with the guidelines of the European Committee on Antimicrobial Susceptibility Testing.

Results: The antimicrobial activities of the compounds were found in a wide range with minimum inhibitory concentration (MIC) values of 15.62-125 µg/mL. Particularly, 4-((2-(2-(4-chloro-3-methyl)acetyl) hydrazineylidene)methyl)phenyl p-methyl benzenesulfonate (4b) was found to be most effective against *Enterococcus faecalis* with MIC value of 15.62 µg/mL.

Conclusion: The findings of this study display that the different derivatives of the molecules in this study may be considered important candidates for future research. Considering the results, it is planned to reach more effective new compounds with modifications to be made by changing the substituents on the aromatic rings.

Keywords: Aldehyde, antimicrobial activity, hydrazide, hydrazone, sulfonate

ÖZ

Amaç: Günümüzde antibiyotik direnci gelişimi hızla artmaktadır. Bu da yeni antibiyotiklerin keşfedilmesini gerekli kılmaktadır. Dolayısıyla bu araştırmanın amacı yeni antibakteriyel ajanlar bulmaktır.

Materyal ve Metot: Yeni sentezlenen bileşiklerin (4a-d, 5a-d) yapıları elemental analiz ve spektroskopik verilerle aydınlatıldı. *Escherichia coli*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, metisiline dirençli *Staphylococcus aureus* and *Enterococcus faecalis*'e karşı mikrodilüsyon tekniği kullanılarak *in vitro* antibakteriyel aktiviteleri test edildi. Avrupa Antibiyotik Duyarlılık Komitesi standartlarına uygun olarak yapılan bu çalışmada, kontrol ilaç olarak siprofloksazin kullanıldı.

Bulgular: Bileşiklerin antimikrobiyal aktivite sonuçları minimum inhibitör konsantrasyon (MİK)=15,62-125 µg/mL olarak geniş bir aralıkta bulundu ve özellikle 4-((2-(2-(4-kloro-3-metil)asetil)hidraziniliden)metil)fenil p-metilbenzensülfonat (4b)' nin 15,62 µg/mL MİK değeri ile *Enterococcus faecalis*'e karşı en etkili olduğu tespit edildi.

Sonuç: Bu çalışmanın bulguları, bu çalışmadaki moleküllerin farklı türevlerinin gelecekteki araştırmalar için önemli adaylar olarak kabul edilebileceğini göstermektedir. Sonuçlar göz önüne alındığında; aromatik halkaların üzerindeki sübstitüentler değiştirilerek yapılacak modifikasyonlarla daha etkin yeni bileşiklere ulaşılması planlanmaktadır.

Anahtar Kelimeler: Aldehit, antimikrobiyal aktivite, hidrazit, hidrazon, sülfonat

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INTRODUCTION

Hydrazones possessing an azomethine -NHN=CH- proton constitute a considerable class of compounds for new drug development and have beneficial roles in treating many bacterial infections.[1] Nitrofurazone, furazolidone and nitrofurantoin are known to contain typical hydrazide-hydrazone moiety, in which the carbonyl group and nitrogen atom are included in the oxazolidine or imidazolidine ring.

In recent years, much attention has been devoted to the synthesis of new hydrazones and to testing these molecules for antibacterial activity.[2–5] In this direction, Nabizadeh et al.[6] reported nitro benzylidene (quinazoline-4-yl) hydrazine scaffold as an antimicrobial agent. Balasubramaniyan et al.[7] reported the synthesis of 2r,6c-diaryl-3t-methylpiperidin-4-one arylsulphonylhydrazones and showed that they exhibit significant activity against bacteria. The 2-(2-(1 -(furan-2-yl)ethylidene) hydrazine) quinazoline-4 (3H)-one was identified as *Escherichia coli (E. coli)* DNA gyrase inhibitor.[8] Similarly, Tekin et al.,[9] in 2023, synthesised a novel series of hydrazide–hydrazones of bis-substituted isovanillin and assessed their antibacterial activity. Some hydrazones showed great inhibition properties against *E. coli* bacterial strains. Recently, several hydrazones discovered in our laboratory have shown potent anti-*Pseudomonas aeruginosa* (*P. aeruginosa)* activity.[10] Besides, sulfonate moiety is known to possess several antimicrobial activities.[11–14]

Because a new series of 4-((2-(2-(aryloxy)acetyl) hydrazineylidene)methyl)phenyl 4-methyl benzenesulfonate and 2-methoxy-4-((2-(2-(aryloxy)acetyl) hydrazineylidene)methyl)phenyl 4-methyl benzenesulfonate was designed and synthesised as potential antibacterial agents.

Thus, we aim to discover new compounds with high antibacterial activity by combining sulfonate and hydrazone groups, each with an antimicrobial effect. These derivatives were evaluated *in vitro* for their activity against *E. coli, P. aeruginosa*, *Staphylococcus aureus (S. aureus)*, methicillin-resistant Staphylococcus aureus (MRSA), and *Enterococcus faecalis (E. faecalis)*.

MATERIALS AND METHODS

Ethical Status: Ethical approval for the study is not required.

Chemistry: Melting points were determined using Schmelzpunktbestimmer SMP II. NMR spectra were recorded on the BRUKER Ultrashield TM spectrometer. Microanalyses were determined by LECO CHNS-932. FTIR spectra were recorded on a Shimadzu 8400S spectrometer. Compounds 2a-d and 3a -b were prepared according to the reported procedure.[15–19]

Synthesis of Compounds 4a-d and 5a-d: A suspension of the hydrazides (2 mmol) 2a-d in absolute ethanol (20 ml) was treated with the 3a-b (2 mmol) catalytic amount of gl. acetic acid and mixture were refluxed for 2-5 h. After completion of reflux, the precipitate formed was collected, dried and recrystallised from ethanol (Figure 1).

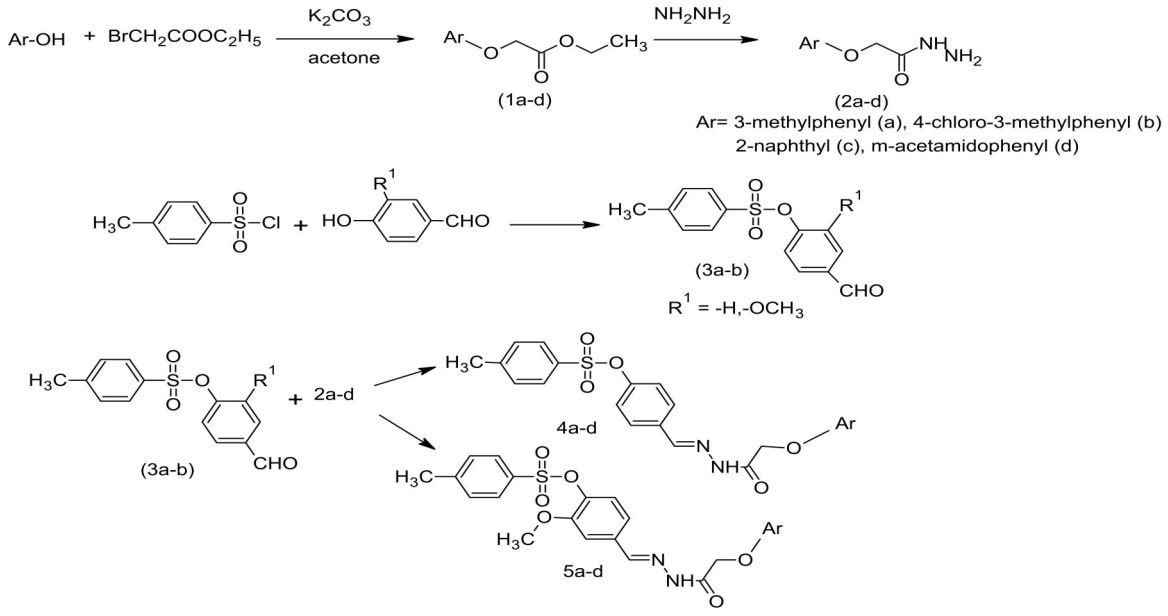

Figure 1. Synthesis of sulfonate-based hydrazones.

4-((2-(2-(m-tolyloxy)acetyl)hydrazineylidene) methyl)phenyl p-methylbenzenesulfonate (4a): Melting point: 143-144°C; FTIR u_{max} (cm^{-1}): 3319 (N-H); 1674 (C=O amide); 1369, 1151 (SO_2). ^{1}H-NMR (300 MHz, DMSO-d_6) δ: 2.26 (s, 3H, -CH_3); 2.28 (s, 3H, -CH_3); 4.63 and 5.09 (2s, 2H, O-CH_2); 6.76-7.76 (m, 12H, aromatic-H); 7.96 and 8.31 (2s, 1H, hydrazone -CH=); 11.62 and 11.63 (2s, 1H, -NH). ^{13}C-NMR (75 MHz, DMSO-d_6) δ: 21.6 (-CH_3), 64.9 and 66.8 (CH_2), 111.8, 112.0, 115.6, 115.8, 121.9, 122.4, 122.9, 123.0, 128.9, 129.1, 129.5, 129.7, 130.7, 131.6, 133.6, 133.7, 139.5, 142.6, 146.4 and 146.8 (CH=N), 150.2 and 150.4 (C-OSO_2), 158.2 and 158.6 (C-O-CH_2), 164.9 and 169.7 (CO). Anal. Calcd for $C_{23}H_{22}N_2O_5S$. 1/3 H_2O: C 62.15%; H 5.14%; N 6.30%; S, 7.21% Found: C 62.35%; H 4.98%; N 6.23%; S 7.43%.

4-((2-(2-(4-chloro-3-methylphenoxy)acetyl) hydrazineylidene)methyl)phenyl p-methylbenzenesulfonate (4b): Melting point: 145-146°C; FTIR u_{max} (cm^{-1}): 3329 (N-H); 1685 (C=O amide); 1371, 1172 (SO_2). ^{1}H-NMR (300 MHz, DMSO-d_6) δ: 2.26 (s, 3H, -CH_3); 2.28 (s, 3H, -CH_3); 4.65 and 5.11 (2s, 2H, O-CH_2); 7.05-7.75 (m, 11H, aromatic-H); 7.95 and 8.27 (s, 1H, hydrazone -CH=); 11.63 (s, 1H, -NH). ^{13}C-NMR-DEPT (150 MHz, DMSO-d_6) δ: 20.2 (-CH_3), 21.6 (-CH_3), 65.3 and 67.0 (CH_2), 114.0, 114.2, 117.7, 117.9, 122.9, 123.0, 128.7, 128.9, 129.1, 129.9, 130.7, 142.7, 146.9 (CH=N). Anal. Calcd for $C_{23}H_{21}ClN_2O_5S$. 1/2 H_2O: C 58.41%; H 4.48%; N 5.92%; 6.78% Found: C 57.43%; H 4.42%; N 5.72%; S 6.81%.

4-((2-(2-(naphthalen-2-yloxy)acetyl) hydrazineylidene)methyl)phenyl p-methylbenzenesulfonate (4c): Melting point: 172-173°C; FTIR u_{max} (cm^{-1}): 3319 (N-H); 1689 (C=O amide); 1375, 1174 (SO_2). ^{1}H-NMR (300 MHz, DMSO-d_6) δ: 2.41 (s, 3H, -CH_3); 4.79 and 5.25 (2s, 2H, O-CH_2); 7.28-7.89 (m, 15H, aromatic-H); 7.99 and 8.30 (s, 1H, hydrazone -CH=); 11.68 and 11.74 (s, 1H, -NH). ^{13}C-NMR (75 MHz, DMSO-d_6) δ: 21.6 (-CH_3), 65.2 (CH_2), 107.4, 107.6, 119.0, 122.0, 123.0, 124.1, 124.4, 126.8, 127.0, 127.1, 127.9, 128.7, 129.0, 129.1, 129.7, 129.9, 130.7, 131.6, 133.6, 134.5, 142.7, 146.4 and 146.9 (CH=N), 150.2 (C-OSO_2), 156.0 and 156.5 (C-O-CH_2), 164.7 and 169.4 (CO). Anal. Calcd for $C_{26}H_{22}N_2O_5S$: C 65.80%; H 4.67%; N 5.90%; S 6.76% Found: C 65.38%; H 4.74%; N 5.91%; S 6.76%.

4-((2-(2-(3-acetamidophenoxy)acetyl) hydrazineylidene)methyl)phenyl p-methylbenzenesulfonate (4d): Melting point: 180-181°C; FTIR u_{max} (cm^{-1}): 3263 (N-H); 1685 (C=O amide); 1352, 1155 (SO_2). ^{1}H-NMR (300 MHz, $CDCl_3$) δ: 2.19 (s, 3H, $NHCOCH_3$); 2.47 (s, 3H, -CH_3); 4.66 and 5.14 (2s, 2H, O-CH_2); 6.67-7.76 (m, 13H, aromatic-H and hydrazone -CH=); 8.24 (s, 1H, $NHCOCH_3$); 9.54 and 9.61 (s, 1H, -NH). Anal. Calcd for $C_{24}H_{23}N_3O_6S$.1/3H_2O: C 59.13%; H 4.89%; 8.62%; S 6.58% Found: C 59.25%; H 4.72%; N 8.62%; S 6.62%.

2-methoxy-4-((2-(2-(m-tolyloxy)acetyl) hydrazineylidene)methyl)phenyl p-methylbenzenesulfonate (5a): Melting point: 138-140°C; FTIR u_{max} (cm^{-1}): 3198 (N-H); 1687 (C=O amide); 1371, 1161 (SO_2). ^{1}H-NMR (300 MHz, $CDCl_3$) δ: 2.35 (s, 3H, CH_3); 2.46 (s, 3H, -CH_3); 3.58 (s, 3H, Ar-OCH_3); 4.67 and 5.14 (2s, 2H, O-CH_2); 7.10-7.79 (m, 11H, aromatic-H); 8.81 (s, 1H, hydrazone -CH=); 9.53 and 9.71 (2s, 1H, -NH). Anal. Calcd for $C_{24}H_{24}N_2O_5S$.1/3H_2O: C 60.75%; H 5.07%; N 5.95%; S 6.79% Found: C 60.75%; H 5.24%; N 5.90%; S 6.76%.

2-methoxy-4-((2-(2-(4-chloro-3-methylphenoxy) acetyl)hydrazineylidene)methyl)phenyl p-methylbenzenesulfonate (5b): Melting point: 165-167°C; FTIR u_{max} (cm^{-1}): 3320 (N-H); 1695 (C=O amide); 1373, 1174 (SO_2). ^{1}H-NMR (300 MHz, DMSO-d_6) δ: 2.28 (s, 3H, -CH_3); 2.42 (s, 3H, -CH_3); 3.54 (O-CH_3); 4.66 and 5.14 (2s, 2H, O-CH_2); 7.16-7.74 (m, 10H, aromatic-H); 7.94 and 8.27 (s, 1H, hydrazone -CH=); 11.68 (s, 1H, -NH). ^{13}C-NMR (75 MHz, DMSO-d_6) δ: 20.2 (-CH_3), 21.6 (-CH_3), 56.1 and 56.4 (OCH_3), 65.3 and 67.0 (CH_2), 110.8, 111.4, 114.0, 114.2, 117.7, 117.9, 120.0, 120.8, 124.3, 125.1, 125.7, 128.7, 129.9, 130.3, 130.4, 132.3, 132.5, 134.6, 136.7, 136.9, 138.9, 139.2, 142.8, 146.1 and 147.2 (CH=N), 152.0 (C-OSO_2), 156.9 (OCH_3), 157.4 (C-O-CH_2), 164.6 and 169.5 (CO). Anal. Calcd for $C_{24}H_{23}ClN_2O_6S$: C 57.31%; H 4.61%; N 5.57%; S 6.38% Found: C 57.23%; H 4.87%; N 5.43%; S 6.75%.

2-methoxy-4-((2-(2-(napthalen-2-yloxy)acetyl) hydrazineylidene)methyl)phenyl p-methylbenzenesulfonate (5c): Melting point: 175-176°C; FTIR u_{max} (cm^{-1}): 3209 (N-H); 1703 (C=O amide); 1355, 1178 (SO_2). ^{1}H-NMR (300 MHz, $CDCl_3$) δ: 2.46 (s, 3H, -CH_3); 3.58 (s, 3H, OCH_3); 4.82 and 5.26 (2s, 2H, O-CH_2); 7.07-7.85 (m, 14H, aromatic-H); 8.18 (s, 1H, hydrazone -CH=); 9.56 and 9.68 (s, 1H, -NH). Anal. Calcd for $C_{27}H_{24}N_2O_6S$.1/4H_2O: C 63.70%; H 4.85%; N 5.50%; S 6.30% Found: C 63.67%; H 5.07%; N 5.51%; S 6.36%.

4-((2-(2-(3-acetamidophenoxy)acetyl) hydrazineylidene)methyl)-2-methoxyphenyl p-methylbenzenesulfonate (5d): Melting point: 177-179°C; FTIR u_{max} (cm^{-1}): 3313 (N-H); 1697 (C=O amide); 1363, 1157 (SO_2). ^{1}H-NMR (300 MHz, $CDCl_3$) δ: 2.19 (s, 3H, $NHCOCH_3$); 2.46 (s, 3H, -CH_3); 3.53 (OCH_3); 4.63 and 5.14 (2s, 2H, O-CH_2); 6.65-7.81 (m, 12H, aromatic-H and hydrazone -CH=); 8.19 (s, 1H, $NHCOCH_3$); 9.81 and 9.95 (s, 1H, -NH). Anal. Calcd for $C_{25}H_{25}N_3O_7S.H_2O$: C

56.70%; H 5.14%; N 7.93%; S 6.30 % Found: C 56.32%; H 5.45%; N 7.48%; S 6.31%.

Determination of the Minimum Inhibitory Concentration: The antibacterial activity of all synthesised compounds was determined by using the micro-dilution method according to The European Committee on Antimicrobial Susceptibility Testing (EUCAST) recommendations against a group of bacteria, including *E. coli* ATCC 25922, *P. aeruginosa* ATCC 27853, *S. aureus* ATCC 29213, MRSA ATCC 43300, and *E. faecalis* ATCC 29212.[20] For the micro-dilution method, briefly, double-fold dilutions of compounds were prepared by adding 100 µl (1000 µg/ml) to the first well of the microplate containing 100 µl of cation adjusted Mueller Hinton Broth (Becton Dickinson) in each well. Then, bacterial suspensions, prepared from fresh cultures of bacteria, equal to McFarland 0.5 turbidity were prepared from fresh cultures, the concentrations were diluted at a ratio of 1/100, and 100 µL was added to all wells. Microplates were incubated at 37°C for 16-20 h, and the lowest concentration that inhibited bacterial growth was determined as the minimum inhibitory concentration (MIC) value. Ciprofloxacin (Himedia, Mumbai, India) was used as the control and the results of ciprofloxacin MIC were evaluated according to the EUCAST quality control.[20]

Statistical Analysis: Data are expressed as means ±SDs. Concerning the MIC values, the experiments were performed in triplicate, the concordance degree was 3/3, and the ±SD was zero.

RESULTS

Hydrazones showed carbonyl amide stretching at 1674-1703 cm^{-1} and N-H bands in 3198-3320 cm^{-1} region. ^{1}H-NMR data were also in agreement with the formation of hydrazones. The ^{13}C-NMR spectra showed the carbonyl signals at 169.48-169.67 ppm, and imine signals at 146.4-147.2 ppm.

The antibacterial activity of the compounds 4a-d and 5a-d were assayed using the micro-dilution method against Gram-negative *E. coli* ATCC 25922 and *P. aeruginosa* ATCC 27853) and Gram-positive (MRSA ATCC 43300, *S. aureus* ATCC 29213 *and E. faecalis* ATCC 29212*)* strains. The results of MICs are presented in Table 1.

The result revealed that none of the compounds displayed better activity than the standard drug Ciprofloxacin. All of them exhibited moderate inhibitory activities (MIC= 62.5 µg/ml) against *P. aeruginosa*. Also, it displayed broad antibacterial spectra with MIC values ranging from 62.5-125 µg/mL against MRSA. Compound 4b bearing 4-chloro-3-methylphenoxy moiety was the most effective molecule having the least MIC value (MIC= 15.62 µg/ml) as compared to the other compounds against *E. faecalis*.

DISCUSSION AND CONCLUSION

The synthesis method is outlined in Figure 1. The synthesis of hydrazide (2a-d) derivatives was prepared according to the literature.[15–19] We have previously reported the synthesis of aldehydes (3a-b).[18] Hydrazones 4a-d and 5a-d were obtained into good yield by coupling 2a-d compounds with the 3a-b aldehydes in ethanol. All the new products gave corrected analytical data. When the ^{1}H-NMR spectra are examined, the absence of the $–NH_2$ peak belonging to the $-NHNH_2$ group proves that our compounds are formed. We also observed two signals for CH_2-CO- and some of the –CONH- protons believed to be due to their presence as conformational or geometrical isomers.[21–23] When the ^{1}H-NMR spectra of the flurbiprofen hydrazide-hydrazones were examined, it was determined that -CH, -CONH, -CH=N groups gave two separate peaks.[24] When viewed in ^{13}C-NMR spectra, the hydrazone structures were supported by the resonance of carbonyl groups in the lower field. Han et al.[25] confirmed that the peak around 169 ppm corresponds to a carbonyl

Table 1. *In vitro* antimicrobial activity of the synthesised compounds, MIC in µg/mL.

Compounds	MIC (mg/mL)*				
	***Pseudomonas aeruginosa* ATCC 27853**	***Escherichia coli* ATCC 25922**	***Enterococcus faecalis* ATCC 29212**	***Staphylococcus aureus* ATCC 29213**	**Methicillin resistant *Staphylococcus aureus* ATCC 43300**
4a	62.5	125	62.5	125	62.5
4b	62.5	125	15.62	125	62.5
4c	62.5	125	31.25	125	62.5
4d	62.5	125	62.5	125	125
5a	62.5	125	62.5	125	125
5b	62.5	125	62.5	125	125
5c	62.5	125	62.5	125	62.5
5d	62.5	125	62.5	125	62.5
Ciprofloxacin	0.25	0.008	0.5	0.5	-

*: MIC: Minimum inhibitory concentration (MIC was determined in three independent experiments).

group. According to the antibacterial activity results, it was understood that compound 4b showed a remarkable effect. When the activity results of all the compounds are examined, they are not better than the antibacterial effect results of the hydrazone compounds mentioned in the information section.

In conclusion, a series of novel hydrazide-hydrazone derivatives incorporating different aryloxy moieties were synthesised and characterised by elemental analysis and spectral methods. All new compounds were evaluated for their antibacterial activity against five bacteria (including three gram-positive and two gram-negative) found as medium to good (MIC=15.62-125 µg/mL) compared with the reference drug. These outcomes propose that further modification of these compounds may give beneficial agents acting as antimicrobial drug candidates.

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Hospitalisation Rates and Radiological Findings in Infants with Head Trauma After a Fall

Düşme Sonrası Kafa Travması Geçiren Bebeklerde Hastaneye Yatış Oranları ve Radyolojik Bulgular

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ABSTRACT

Objective: The study aimed to determine the necessity of performing computed tomography (CT) scans in infants with head trauma because of falls because of concerns regarding radiation exposure by evaluating the hospitalisation rates.

Materials and Methods: The present study included 1060 patients who underwent cranial CT in the emergency department owing to a pediatric fall between 2018 and 2022. Two patients were excluded due to treatment refusal. Skull fractures, their characteristics, associated skin findings, and intracranial hemorrhage on CT scans and patients' demographic features (age & sex), medical history, and hospitalisation rates were investigated.

Results: Of the 1058 patients with head trauma who presented to the emergency department in the secondary care centre, fractures were detected in only 28 patients. Of these patients, 1.8% were treated as inpatients. Subdural hematomas and epidural hematomas were detected in 10.7% (n=3) and 7.1% (n=2) of patients with fractures, respectively. Furthermore, subdural hematomas and epidural hematomas were detected in 0.3% and 0.2% of trauma admissions, respectively.

Conclusion: In conclusion, positive CT findings and a low percentage of patients requiring hospitalisation stand out in the patients examined. Therefore, care should be taken when requesting tomography between the ages of 0-2.

Keywords: CT imaging, head trauma, hospitalisation rates, infant, skull fracture

ÖZ

Amaç: Bu çalışmada, düşme sonucu kafa travması geçiren bebeklerde radyasyona maruz kalma endişesi nedeniyle bilgisayarlı tomografi (BT) taraması yapılmasının gerekliliğinin hastaneye yatış oranları değerlendirilerek belirlenmesi amaçlanmıştır.

Materyal ve Metot: Bu çalışmaya 2018-2022 yılları arasında acil serviste pediatrik düşme nedeniyle kraniyal BT çekilen 1060 hasta dahil edildi. İki hasta tedavi reddi nedeniyle dışlandı. BT taramalarında kafatası kırıkları ve özellikleri ve ilişkili cilt bulguları ve intrakraniyal kanama, hastaların demografik özellikleri (yaş ve cinsiyet) ve tıbbi öyküleri, hastaneye yatış oranları araştırıldı.

Bulgular: İkinci basamak merkezinin acil servisine başvuran 1058 kafa travmalı hastadan sadece 28'inde kırık tespit edildi. Bu hastaların %1,8'i yatarak tedavi edildi. Kırığı olan hastaların sırasıyla %10,7'sinde (n=3) subdural hematom ve %7,1'inde (n=2) epidural hematom tespit edilmiştir. Ayrıca, travma başvurularının sırasıyla %0,3'ünde ve %0,2'sinde subdural hematom ve epidural hematom tespit edildi.

Sonuç: Sonuç olarak, incelenen hastalarda pozitif BT bulguları ve hastaneye yatış gerektiren hasta oranının düşüklüğü göze çarpmaktadır. Bu nedenle 0-2 yaş arasında tomografi istenirken dikkatli olunmalıdır.

Anahtar Kelimeler: Bebek, BT görüntüleme, hastaneye yatış oranları, kafatası kırığı, kafa travması

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INTRODUCTION

Infants (0-2 years) have fundamentally different neurotrauma pathophysiology. During this age range, the skull, subarachnoid space, cerebrospinal fluid flow, and certain parts of the brain undergo growth and development. Cephalohematoma, subaponeurotic (sub-galeal) hematoma, diastatic skull fracture, growing skull fracture, depressed ("ping-pong") skull fracture, and extradural hematoma are the most frequent neurotraumatic events in infants 0 –2 years old.[1] Infants typically exhibit convulsions, pallor, and a sudden loss of consciousness. A brain computed tomography (CT) scan is usually the preferred test.[2] Infants have a more comprehensive and differentiated disease than adults; therefore, children who have suffered head injuries must be sent to a pediatric neurosurgery department or a pediatric critical care unit.[3] According to the Eastern Association for the Surgery of Trauma's guideline for evaluating blunt cerebrovascular injury (BCVI), pediatric trauma patients should be examined using the same criteria as adults. The risk factors for BCVI in pediatric trauma patients (Glasgow Coma Scale <8, skull base fracture, cervical spine fracture, complicated face fractures, and soft tissue damage to the neck) appear to be similar to those in adult patients.[4] Owing to the smaller body size of children, and therefore a larger area of exposure, scalp and head injuries in children are more prevalent and possibly more fatal than in adults. The initial diagnosis of pediatric skull fractures with CT may be delayed to reduce infant radiation exposure, making clinical follow-up essential. A small percentage of pediatric cranial fractures may progress to a developing skull fracture, manifesting as a widening skull fracture, pulsatile mass and neurological problems. To distinguish between cranial and cerebral damage when treating developing skull fractures, CT and magnetic resonance imaging are crucial techniques. Multidisciplinary surgical treatment benefits patients and necessitates extensive scalp exposure, craniotomy access, intracranial debridement, dural repair, and cranial reconstruction.[5]

The study aimed to determine the necessity of performing computed tomography (CT) scans in infants with head trauma due to falls because of concerns regarding radiation exposure by evaluating the hospitalisation rates.

MATERIALS AND METHODS

Ethics Committee Approval: This study was approved by the Kafkas University Clinical Research and Ethics Committee (Date: 26.05.2021, decision no: 06-20). All procedures for studies involving human participants were carried out in accordance with the 1964 Declaration of Helsinki.

Patient Selection: Patients who presented with fall trauma and underwent CT in the emergency department were included. Patients were evaluated retrospectively. In total, 1060 archived cranial CT scans of infants who presented to the emergency department between January 01, 2018, and May 01, 2022, were examined. Radiological pathology was observed in 30 patients; however, two patient was excluded because of treatment refusal. Therefore, a total of 28 patients were investigated.

Evaluation of CT Images: Cranial CT scans were performed with Toshiba Alexion 32 Multi-Slice, Canon Medical Systems Corporation (Tochigi, Japan). In the radiology clinic, the cranial CT images included 1 mm coronal/axial and sagittal sections, according to protocol. Patient characteristics such as fracture site, displacement status, skin findings, bleeding findings, and bleeding type were recorded and compared.

Statistical Analysis: Statistical Packages for Social Sciences (SPSS; Chicago, IL, USA) version 25 was used for data analysis. Demographic data were given as frequency in patients with positive CT findings and all patients.

The frequency of fracture characteristics was given both within and across all patients. All variables except age were categorical. Variables were evaluated by chi-square analysis. Fisher Exact Test and Continuity Correction Tests were applied in cross-tabulations. P value <0.05 was considered statistically significant.

RESULTS

Based on cranial CT images of the 1058 patients who presented to the emergency department in the secondary care center with head trauma, radiological pathology was detected in only 28 patients. Of those 1058 patients, 1.8% were treated as inpatients. Subdural hematomas and epidural hematomas were detected in 10.7% (n=3) and 7.1% (n=2) of patients with fractures. Moreover, subdural hematomas and epidural hematomas were detected in 0.3% and 0.2% of trauma admissions (Table 1).

In 28 patients with radiologic pathology, seventeen (60.7%) fractures were found on the left, and 11 (39.3%) were found on the right. The most common fracture location was the parietal bone (53.6%, n=15). Fractures were generally found to be non-displaced (71.4%, n=20), and typically not accompanied by skin findings (64%, n=18). Among patients with fractures, 25% showed thickening of the scalp, and in 10% of patients, the fractures were accompanied by a cephalohematoma. Cerebral hemorrhage was not detected in 82.1% (n=23) of the patients with fractures. Subdural hematomas and epidural hematomas were found in 10.7% (n=3) and 7.1%

Table 1. Demographic data of patients with radiologic pathology.

Patient Characteristics		n-28	%	n-1058 %
Gender	Female	15	53.6	1.4
	Male	13	46.4	1.2
Age	10.5±6.43 months (min 0- max23)			
Hospitalisation	Outpatients	9	32.1	0.9
	Inpatients	19	67.9	1.8
Days	1 day	12	42.9	1.1
	2 days	4	14.3	0.4
	3 days	3	10.7	0.3
Fall Story	No data	16	57.1	1.5
	Yes	12	42.9	1.1
Fall Type	Free altitude (0.5m-1.5m)	4	14.3	0.4
	From crib, sofa, seat	4	14.3	0.4
	Falling off the lap	3	10.7	0.3
	Falling down the stairs	1	3.6	0.1

(n=2) of the patients with fractures. Five patients with cerebral hemorrhage required hospitalisation (Table 2).

An analysis of factors affecting hospitalisation showed no significant correlation between the hospitalisation and the fracture site, displacement status and skin changes (Table 3, $p>0.05$). As seen in Table 3, 13 male patients out of 15 and six female patients out of 13 were hospitalised. So, hospitalisation rates significantly higher in male infants than female infants. ($p=0.029$, Cramer's $V=0.433$).

Table 2. Features of fractures.

Patient Characteristics		Number of patients	%	Rate in all patients (1058) screened (%)
Fracture Side	Right	11	39.3	1.1
	Left	17	60.7	1.6
Fracture Location	Parietal	15	53.5	1.4
	Frontal	6	21.4	0.6
	Occipital	5	17.9	0.5
	Temporal	1	3.6	0.1
	Maxillary	1	3.6	0.1
Fracture Type	Displaced	8	28.6	0.8
	nondisplaced	20	71.4	1.9
Accompanying skin finding	No	18	64.3	1.7
	Yes	10	35.7	0.9
	Cephalic hematoma	3	10.7	0.3
	Thickening of the scalp	7	25.0	0.7
Accompanying brain hemorrhage	No	23	82.1	2.2
	Yes	5	17.9	0.5
	Subdural Hematoma	3	10.7	0.3
	Epidural Hematoma	2	7.1	0.2

Table 3. Factors affecting hospitalisation in patients with positive imaging.

Patient Characteristics	No Hospitalised	Hospitalised	p-value
Male	2	13	**0.029**[a]
Female	7	6	
Right Fracture	3	8	0.493 [a]
Left Fracture	6	11	
Parietal Fracture	4	11	0.396 [a]
Other Location	5	8	
Displaced Fracture	2	6	0.949[b]
Non-Displaced Fracture	7	13	
Skin Finding	1	9	0.148[b]
No skin Finding	8	10	

a: Fisher Exact Test; b: Continuity Correction.

DISCUSSION AND CONCLUSION

We aimed to determine the frequency of radiologic imaging findings. Fractures were present in only 2.7% of patients. The most common finding was nondisplaced fractures in the parietal bone. Skin findings were usually not associated. The rate of positive CT findings was low, and the rate of cerebral hemorrhage was 0.5%. A skull fracture is a typical side effect of head trauma, a common cause of morbidity and death in children. Skull fractures in children differ from those in adults. Although the brain and craniofacial bones are still undergoing growth in children, they have a stronger ability to rebuild after a fracture.[6] In our study, traumatic brain hemorrhage was detected in 5 patients among 1058 trauma patients. Three traumatic brain hemorrhage was reported in 1574 trauma patients under one year of age admitted to the Pediatric Emergency Department in Scotland. The rate of cerebral hemorrhage was 0.2% in this study, and 0.5% in our study, and the results are correlated.[7]

One study suggested that children under two years of age can be examined without imaging.[8] Clinical decision criteria for diagnosing skull fractures in young children with head trauma but not requiring immediate head CT scan facilitated the identification of 90% of skull fractures in young children with moderate head trauma and not requiring immediate head CT scan. Using these criteria reduced radiologic evaluations by approximately 60%.[9]

A large prospective study of linear skull fractures due to mild head trauma in children under 18 included 43,904 children and 11,035 children under two. Fractures were found in 222 (%2) children under 2 years old, and 120 (%1) of these patients needed hospitalisation. Our study's results were similar, with a fracture rate of 2.7% and a hospitalisation rate of 1.8%.[10]

Young children are frequently injured due to falls. Mild head injury (MHI), also known as blunt head injury, is the most common head injury among falling children. To determine the cause and extent of injury, 595 children who fell from various heights were investigated. 10 (1.7%) patients had linear skull fractures, and five (0.8%) had a cerebral hemorrhage. The fracture and cerebral hemorrhage rates were similar to our study's results.[11] High-performance clinical decision rules (CDRs) have been developed to determine whether children with head injuries require a brain CT. The effectiveness of the Pediatric Emergency Care Applied Research Network (PECARN) CDRs, the Children's Head Injury Algorithm for the prediction of Important Clinical Events (CHALICE) CDRs and the Canadian Assessment of Tomography for Childhood Head Injury (CATCH) CDRs were assessed. The implementation of CDRs significantly increased the number of children exposed to CT: CATCH (20.1%), CHALICE (23.9%), PECARN high and intermediate risk (38.7%), and PECARN high risk (3.8%). Although direct implementation in regions with a low prevalence of serious TBI is expected to increase the number of unnecessary CT scans requested, CDRs have shown great accuracy in identifying children with positive CT results.[12]

Since the risk of intracranial hemorrhage in children with moderate traumatic brain injury (TBI) cannot be predicted by any clinical signs or symptoms, a wait-and-see strategy without initial imaging has been reported to be appropriate and safe in children with TBI without significant neurological symptoms.[13] Moreover, since the risk of complications of isolated skull fractures in children is low, these patients can be discharged without hospitalisation. It has been reported that this change in practice will lead to significant cost savings in healthcare services.[14,15] In our study, nine patients with isolated skull fractures were initially followed up with a wait-and-see strategy and discharged without hospitalisation since no significant clinical findings developed.

The most frequent cause of death and a substantial source of morbidity in children and young people worldwide is pediatric TBI. A retrospective assessment of all pediatric highly populated urban regions during two years showed that the most frequent cause of injury was pedestrian collisions, followed by falls from heights. The number of boys receiving injuries was five times higher than that of girls. Skull fractures and contusions were the most frequent intracranial injuries.[16] Children with mild TBI rarely exhibit clinically significant neurological impairment, even in the presence of intracranial bleeding. Additionally, there is ongoing debate concerning the value of routine surveillance imaging in the pediatric population, particularly in light of concerns about the risks of early radiation exposure. A level III epidemiological study demonstrated that clinical changes, rather than repeat imaging, help categorize all patients needing neurosurgical intervention. In most cases, clinical monitoring alone is safe and sufficient to avoid exposure to repeated radiographic imaging.[17] Children frequently experience skull fractures from unintentional falls. The establishment of biomechanical thresholds for newborn skull fractures has been hampered by the absence of comprehensive data from actual pediatric traumas. The parietal bone had the most fractures in this study and the literature. The likelihood of an infant suffering a parietal skull fracture from a 0.3 m fall has been low (0%–54%). For concrete and carpet impacts, the likelihood of head-on falls from 0.9 m resulting in fractures was high (86%–100%) and intermediate (34–81%), respectively. The impact surface affected

the likelihood of fractures in 0.6 m falls. Occipital impacts from 0.9 m to concrete also had a 25%–70% likelihood of resulting in a parietal skull fracture.[18] A study that used 231 head CT 3D reconstructions showed that the impact surface played a significant role in the number of cracks present in a fracture, considering younger babies and higher fall heights, suture-to-suture spread, and biparietal involvement. Their findings showed that soft tissue edema occurred as a consequence of the position of the fracture rather than the location of impact.[19] In another study, a scoring system based on the initial CT imaging was developed to differentiate clinically significant TBI. Depressive skull fracture, pneumocephalus, epidural hematoma, subdural hematoma, and contusion were reported as independent variables. Thus, it has been reported that low- and high-risk TBI can be differentiated.[20]

In conclusion, there are some limitations in our study. This study is a cross-sectional research study in a single-centre secondary-level hospital. The fall history of some patients could not be determined. The absence of a pediatric trauma centre may have influenced the findings. The low number of positive CT findings and the low rate of patients requiring hospitalisation were noteworthy. Therefore, care should be taken when requesting tomography between the ages of 0-2.

Ethics Committee Approval: Our study was approved by the Kafkas University Ethics Committee (Date: 26.05.2021, decision no: 06-20). The study was carried out following the 1964 Helsinki Declaration.

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Smoking in Children: A Habit or Fixation?

Çocuklarda Sigara: Bir Alışkanlık mı, Yoksa Saplantı mı?

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ABSTRACT
Even though most of the Indian population lives in a joint family system, where the focus of attention for the family is the child; still smoking in childhood and adolescence is very much prevalent. What is most disturbing about this fact, three-quarters of adolescents who smoke frequently carry on smoking as adults. It brings us to the point that, do we need to think of any other alternative, or do we need to shift our focus to some other direction? Should the focus be shifted from habit to years of psychological and personality development of the child?
Keywords: Adolescents, children, fixation, habit, smoking

ÖZ
Hint nüfusunun çoğu, ailenin ilgi odağının çocuk olduğu ortak bir aile sisteminde yaşıyor olsa da çocukluk ve ergenlik döneminde hala sigara içmek çok yaygındır. Bu gerçeğin en rahatsız edici yanı, sık sık sigara içen ergenlerin dörtte üçünün yetişkin olduklarında da sigara içmeye devam etmeleridir. Bizi şu noktaya getiriyor; başka bir alternatif düşünmemiz mi gerekiyor yoksa odağımızı başka bir yöne mi kaydırmamız gerekiyor? Odak noktası, alışkanlıktan çocuğun yıllarca süren psikolojik ve kişilik gelişimine kaydırılmalı mı?.
Anahtar Kelimeler: Alışkanlık, çocuklar, ergenler, saplantı, sigara

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Dear Editor!

Smoking is one of the biggest health concerns accounting for six million deaths annually worldwide. Most smokers are said to begin smoking at a young age.[1] Ahmed et al.[2] observed that smoking in middle-class American families' children starts at the mean age of 8.5 years, ranging between 6 and 11 years. India is considered the second-largest tobacco consumer, and statistics show that the ratio of cigarette smoking in adolescents of the age group 13-15 years is 1:10.[3] Based on the Global Youth Tobacco Survey (GYTS) conducted in 2006, 36.9% of children in India start smoking before the age of ten.[4] What is most disturbing about this fact is that even though a majority of the Indian population lives in a joint family system, where the focus of attention for the family is the child; still smoking in childhood and adolescence is very much prevalent.[3,4] Sharma et al.[4] observed that even though the government is using preventive and therapeutic strategies like spreading awareness, early identification of users, restriction of sales, counselling etc.; still tobacco use in adolescents has increased at alarming rates.[4] Approximately three-quarters of adolescents who smoke frequently carry on smoking as adults.[5]

Importance of Psychoanalysis for the Child

Sigmund Freud (1856–1939) is considered the founder of psychoanalysis, which today is used as a theory, a method of treatment, and as a method of investigating the human mind. Even today, psychoanalysis remains the most comprehensive and complex attempt to understand human behaviour, both normal and pathological; the key focus is on cognitive, emotional, and motivational aspects of personality development, including the possible biological bases of these processes.[6] According to Freud, the basic survival of an infant revolves around interaction with a primary caretaker, who is also the psychobiological regulator of the infant's needs and tension states and the source of immediate gratification of his needs. The psychosexual development of a person involves many stages: oral (Birth-18 months), anal (18 months – 3 years), phallic (3-6 years), latent (6-12 years) and genital (puberty and up to 22 years). Freud believed that an individual's psychosexual development is an adaptation to their unique surroundings and an outcome of the successful completion of all the psychosexual phases.[7] He also hypothesized that children could have three types of fixation: oral, anal and phallic fixation; the

first stage being the oral. During different phases of psychosexual development, the area of gratification is different. Also, the various phases vary in their ability to fulfil the libido,[8] and the factors responsible for this evolutionary growth are innate unconscious inclinations and motives. Children face a conflict at each developmental level that they have to tackle effectively to advance towards the next stage.[7] During the first stage, the area of gratification or the control of libido is through the oral cavity. If the child doesn't pass through this stage successfully, they tend to be orally fixated. These unfulfilled needs can present as negative behaviours or habits. Anal fixation can lead to the development of an anal -retentive personality, where the adult may be excessively tidy and can have OCD (Obsessive Compulsive Disorder) characteristics or an anal-expulsive personality, where the individual may become messy and disorganised. During Phallic fixation, the child may associate more closely with same-sex parents and develop a personality which is more conceited pleasure-seeking, or sexually aggressive.[8] Other theorists like Melanie Klein, Erik Erikson, Eric Berne and Heinz Kohut have also explored and worked in the field of fixation. According to Freud; the inability to get through a stage would leave the person functionally "stuck." In simpler terms, they get "fixated" at that stage of development. Freud also suggested that fixations could occur if a specific stage significantly impacted a person's psyche.[7]

Psychosexual Development Stage and Smoking

Childhood experiences have a major impact on future personality. Gratifications, frustrations, and conflicts at each stage of the psychosexual development stage influence the next stage. The impossibility of immediate gratification makes way for the reality principle and eventual satisfaction. Excessive gratification or frustration at any stage can lead to fixation or regression. Fixation refers to the persistence of behaviour beyond the stage at which it was age appropriate. For example, a habit of thumb sucking, though considered appropriate till age 4, is considered fixation if seen at age 5. Though oral fixation is mostly associated with childhood neglect, it can occur even if the child is overprotected, and overfed. Sigmund Freud suggested that nail-biting, gum-chewing, and alcohol and drug dependency are indicators of an oral fixation. These disturbances are associated with the "oral stage" of psychological development,[9] indicating that the person failed to solve the primary conflicts during the oral phase of psychosexual development.[7] Smoking is also considered a fixation in the oral stage of a child's development. According to the hypothesis, the oral personality considers the mouth the most significant source of pleasure, leading to overeating and excessive use of alcohol or drugs. Researchers have attempted to correlate orality with smoking and validate the credibility of psychoanalytic theory in this context; nevertheless, the results have been varied, and research findings have often been of less significance. An assessment of clinical data revealed limited evidence in favour of the effectiveness of psychodynamic psychotherapy for substance-related conditions (albeit none of the studies examined smoking), but researchers feel that more studies should be conducted.[10]

Freud was also fixated orally, as he was a heavy cigar smoker diagnosed with jaw cancer in 1923. Even after more than 30 operations, his tumour returned and was declared inoperable. The tumour was so large that he had to wear an oral prosthesis dividing his nasal and oral cavities.[7] But none of this influenced him quit smoking, and Cigars were more valuable to him than his life. He claimed cigars were responsible for his work's 'colossal intensity', and he could not write even a single sentence without them. He felt relieved when he resumed smoking regularly. The suffering was so unbearable that he requested a lethal dosage of morphine and passed away on September 23, 1939, in London at the age of 83.[8]

This can probably explain why despite giving the theory of psychosexual development and psychoanalysis, he could not get over his oral fixation. This may be a reason for addiction to smoking for a large population, as there is oral gratification associated with smoking.

In conclusion, worldwide various strategies are being worked upon to control the habit of smoking. Whether it is the use of alternative drugs or deaddiction centres or studying the role of genetics, still there is no satisfactory solution for this problem. This brings us to the point that, do we need to think of any other alternative, or do we need to shift our focus to some other direction? Should the focus be shifted from habit to years of psychological and personality development of the child? The concept of anticipatory guidance and dental homes is well-known in Pediatric Dentistry. However, it does not include counselling regarding the psychological and personality development of the child. If we can increase the parents' understanding regarding the child's formative years, the problem of smoking in children can probably be eradicated. There is a need to have a multidisciplinary approach to managing smoking, rather than just thinking about therapy. The change needs to start from the beginning, where experts from various fields like psychologists, pediatric dentists, occupational therapists etc. come together where timely counselling can be provided at regular intervals to parents and children. This can help the child successfully resolve conflicts at each stage and we are able to control this problem at the

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