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RESEARCH ARTICLE

Sociodemographic and Clinical Characteristics of Gender Dysphoria Cases at a University Hospital in the Black Sea Region

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ABSTRACT

Objective: Gender dysphoria is a condition defined by distress resulting from the incompatibility between an individual's physical sex and gender identity, accompanied by a desire to belong to the opposite sex. In this study, we aimed to investigate the sociodemographic and clinical characteristics of patients diagnosed with gender dysphoria and followed up at a university hospital in the Black Sea Region, as well as to identify differences between trans women and trans men in terms of these characteristics.

Method: The study included 27 cases who were followed up with a diagnosis of gender dysphoria at a university hospital's Psychiatry Outpatient Clinic between 2015 and 2021. Sociodemographic data and clinical characteristics of the patients with gender dysphoria were analyzed.

Results: It was observed that a higher proportion of trans men (77.8%) sought treatment for gender dysphoria compared to trans women (22.2%). An additional psychiatric illness, mainly depression and anxiety, was present in 55.6% of cases. Statistically significant differences were found in the suicidal ideation during follow-up and past trauma between trans women and trans men. Family and peer support was found to be greater in trans men than in trans women, trans men were more likely to be approved by coworkers at a statistically significant level.

Conclusions: This study revealed that trans women and trans men experience different mental health risks, such as social acceptance, family support, suicide, and trauma history, with trans men showing an advantage over trans women.

Keywords: Gender Dysphoria, Trans Woman, Trans Man, Sociodemographic Features, Clinical Characteristics.

Karadeniz Bölgesinde Bir Üniversite Hastanesinde Cinsiyetinden Hoşnutsuzluk Olgularının Sosyodemografik ve Klinik Özellikleri

ÖZET

Amaç: Cinsiyetinden hoşnutsuzluk, bireyin fiziksel cinsiyeti ile cinsiyet kimliği arasındaki uyumsuzluk ve karşı cinsiyette olma isteği ile tanımlanmıştır. Bu çalışmada Karadeniz Bölgesi'nde bir üniversite hastanesinde cinsiyetinden hoşnutsuzluk ile takip edilen olguların sosyodemografik ve klinik özellikleri, bu özellikler açısından trans kadın ve trans erkekler arasındaki farklılıkların belirlenmesi amaçlanmıştır.

Yöntem: Çalışmaya bir üniversite hastanesi Psikiyatri Polikliniği'nde 2015-2021 yılları arasında cinsiyetinden hoşnutsuzluk tanısı ile takip edilen 27 olgu alınmıştır. Olguların sosyodemografik verileri ve cinsiyetinden hoşnutsuzluk tanısına yönelik klinik özellikleri değerlendirilmiştir.

Bulgular: Çalışmada cinsiyetinden hoşnutsuzluk nedeniyle psikiyatriye başvuran trans erkekler (%77,8) trans kadınlara (%22,2) göre daha çoktur. Olguların %55,6'sında başta depresyon ve anksiyete olacak şekilde ek bir psikiyatrik hastalık vardır. Trans kadınlarda takip sürecinde intihar düşüncesi, geçmiş travma öyküsü trans erkeklere göre istatistiksel açıdan anlamlı şekilde yüksektir. Trans kadınlara göre trans erkeklerde aile ve akran desteği daha yüksek, iş arkadaşları tarafından onaylanma durumu trans erkeklerde trans kadınlardan istatistiksel açıdan anlamlı şekilde yüksek bulunmuştur.

Sonuç: Bu çalışmada trans kadın ve trans erkeklerin toplumsal kabulü, aile destek düzeyi, intihar, travma öyküsü gibi ruh sağlığı riskleri açısından farklı deneyimlere sahip olduğu, trans erkeklerin trans kadınlara göre avantajlı olduğu gösterilmiştir. Bu bağlamda trans bireyler arasındaki cinsiyet farklılıklarını ele alan özelleştirilmiş yaklaşımların geliştirilmesi önerilmektedir.

Anahtar Kelimeler: Cinsiyetinden Hoşnutsuzluk, Trans Kadın, Trans Erkek, Sosyodemografik Özellikler, Klinik Özellikler.

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INTRODUCTION

Gender identity is the gender with which a person perceives herself, her body and her identity (1). It is one of the basic parts of identity and is defined as the feeling of knowing the gender (female, male or an alternative gender) to which one belongs (2, 3). The concept of gender identity (4), the basic elements of which are considered to be shaped at the end of the first 2-3 years of life, is a subjective experience of which gender the person identifies with (2).

Distress and stress experienced due to the incompatibility between the person's physical sex at birth, primary and secondary sex characteristics, gender role and gender identity is called gender dysphoria (5, 6). People with gender dysphoria are considered under the diagnosis of 'transsexualism' according to ICD-10. In DSM 5, the diagnostic category of 'gender dysphoria' was defined to correspond to the concept of transgender, which is widely used as an umbrella term to include different degrees of gender identity not matching with physical sex (7). These patients identify themselves as "transgender", "transsexual", "trans", and increasingly as "nonbinary" who are incompatible with binary gender (8, 9). In studies in the literature, it was reported that the prevalence of mental disorders that can be associated with stress, especially major depression and anxiety disorders, in those who are dissatisfied with their gender is higher than the general population (10, 11). Patients who are dissatisfied with their gender feel this distress in all areas of life and want to achieve changes in their bodies in accordance with their gender identity through medical interventions in the form of hormonal treatment and/or various surgical procedures (12). Current medical approach to gender dysphoria is a multidisciplinary process including detailed psychological, physical and social evaluation and gradual adaptation of physical sex characteristics to the individual's gender identity (6, 13).

There are limited number of studies in Turkey in which sociodemographic and clinical characteristics of gender dysphoria are addressed and differences between trans women and trans men are evaluated (14).

In this study, it was aimed to determine the sociodemographic and clinical characteristics of patients with gender dysphoria who were followed up by a university hospital psychiatry clinic in the Black Sea Region, which has a socially traditional structure, as well as the differences between trans women and trans men in terms of these characteristics.

MATERIAL AND METHODS

This is a descriptive study defining the characteristics of the patients with the diagnosis of gender dysphoria. Transsexualism/gender dysphoria expressions were screened among a total of 748 patients who applied to the sexual dysfunctions outpatient clinic at a university hospital's Psychiatry Outpatient Clinic between 2015 and 2021, and retrospective file evaluation of the cases followed up with the diagnosis of gender dysphoria was performed. We included a total of 27 cases with complete data in the file review. Sociodemographic characteristics including age, employment status, educational status, with whom they lived, and clinical data including presence of additional psychiatric illness and treatment, history of suicide attempt, history of past trauma, duration of follow-up with the diagnosis of gender dysphoria, family and social environment attitude, and medical practice records including hormone and surgical treatment were recorded.

For the study, written permission and Ethics Committee approval were obtained.

Statistical Analysis: The data were evaluated using SPSS (Statistical Package for the Social Sciences) 23.0 package program. Number and percentage were used to summarize qualitative data, and mean, standard deviation, minimum and maximum values were used to summarize quantitative data. Chi-Square and Fisher tests were used to compare categorical variables. Quantitative variables were evaluated with Mann-Whitney U, Student t test, Kruskal Wallis test and ANOVA test. The correlation of quantitative variables was evaluated with Pearson and Spearman correlation tests and Type-1 error level was accepted as <0.05.

RESULTS

In this study, 27 patients with a diagnosis of gender dysphoria were included. The mean age at presentation was 25.7 ± 6.9 years (min 18 - max 53), six were trans women (22.2%) and 21 were trans men (77.8%). Of the cases, 55.6% were unemployed and 44.4% were employed. Educational level was high school and below in 63% and university and above in 37%. Of the patients, 66.7% were living with their families, 18.5% were living alone and 14.8% were living with friends. In 55.6% of all cases, there was a comorbid psychiatric disorder, the most common being major depressive disorder (66.7%) and anxiety disorder (13.3%). Among those with comorbid psychiatric illness, 73.3% were followed up with antidepressants, 20% with antidepressants and antipsychotics and 13.3% with psychotherapy. Although 7.4% of the patients had a history of suicide attempt, 25.9% stated that they had suicidal thoughts during the follow-up period. There was a history of abuse in 25.9% of the cases included in the study. Of these, 57.1% were physical abuse and 28.6% were sexual abuse.

There was no family support in 59.3% of all cases. While 81.5% of the cases stated that they were approved by their peers, 60% were approved by their coworkers, 40.7% were approved by their relatives. Among those who evaluated the approach of the workplace in terms of the period of employment and the process of finding a job, 30% stated that they could not find a job due to the diagnosis of gender dysphoria.

The mean follow-up period in psychiatry outpatient clinic was 20.52 ± 17.09 (min 2 max 82) months. After psychiatric follow-up and hormone approval, 55.6% of the cases were referred to the endocrinology outpatient clinic and hormone treatment was initiated and 25.9% of those applied to judicial processes for identity change and surgery approval after hormone treatment. While 29.6% of the cases underwent surgery for body change in accordance with gender identity, 62.5% of the surgical procedures were illegal. Of all cases, 44.4% discontinued psychiatric follow-up before the process was completed. No significant differences were found between trans women and trans men in terms of age, employment status, educational level, or the presence of comorbid psychiatric diagnoses (Table 1). However, suicidal ideation during follow-up and history of past trauma were significantly higher among trans women compared to trans men. In terms of social support from family, peers, and coworkers, trans men tended to report more favorable outcomes (Table 2). No statistically significant differences were observed between the groups regarding medical follow-up or applications for hormone therapy and surgical procedures (Table 3).

Table 1. Sociodemographic Data of Trans women and Trans men

		Trans women			**Trans men**			
		Mean±sd	**Min-max**	**Median**	**Mean±sd**	**Min-max**	**Median**	**p**
Age		28.5±12.5	18-53	25	24.9±4.5	18-36	24	0.75
		n	**%***		**n**	**%***		
Working status	Employed	1	16.7		11	52.4		
	Unemployed	5	83.3		10	47.6		0.18
Educational status	High school and below	4	66.7		13	61.9		1.00
	University and above	2	33.3		8	38.1		
Living situation	Lives with family	3	50		15	71.4		
	Lives alone	1	16.7		4	19		
	Lives with friends	2	33.3		2	9.5		
Presence of psychiatric illness	No	2	33.3		10	47.6		
	Yes	4	66.7		11	52.4		0.66
Presence of psychiatric treatment	No	2	33.3		10	47.6		
	Yes	4	66.7		11	52.4		0.66
History of suicide attempt	No	6	100		19	90.5		
	Yes	0	0		2	9.5		1.00
Presence of suicidal thoughts during the process **	No	2	10		18	90		
	Yes	4	57.1		3	42.9		0.02
Past trauma history **	No	2	33.3		18	85.7		
	Yes	4	66.7		3	14.3		0.02

* Table presented as column percentage. ** Presented as a percentage of rows.

Table 2. Family and Social Environment Support of Trans women and Trans men

		Trans women			**Trans men**			
		Mean±sd	**Min-max**	**Median**	**Mean±sd**	**Min-max**	**Median**	**P**
How many people in the family know?		0.50±0.84	0-2	0	1.48±1.40	0-4	1	
How many people in the family approve?		2.67±1.52	1-4	3	3.48±1.72	1-9	3	0.59
		n	**%***		**n**	**%***		
Family support**	No	2	12.5		14	87.5		0.19
	Yes	4	36.4		7	63.6		
Peers approach	Approved by peers	3	50		19	90.5		0.06
	Not approved by peers	3	50		2	9.5		
Approach of the workplace (period of employment)	Approved by those at work	0	0		12	100		0.01
	Not aproved by those at work	2	100		0	0		
Relatives' approach	Approved by relatives	1	16.7		10	47.6		0.35
	Not approved by relatives	5	83.3		11	52.4		

* Table presented as column percentage. ** Presented as a percentage of rows.

Table 3. Gender Dysphoria Follow-up Process of Trans women and Trans men

		Trans women			**Trans men**			
		Mean±sd	**Min-max**	**Median**	**Mean±sd**	**Min-max**	**Median**	**p**
Polyclinic follow-up period with the gender dysphoria (months)		23.17±29.57	3-82	13	19.76±12.58	2-45	18	0.55
		n	%*		n	%*		
Endocrinology application for hormone therapy		4	66.7		11	52.4		
Application for surgery and identity change after hormone therapy		1	16.7		6	28.6		
Continuity of the process	Drop out	4	66.7		19	90.5		0.36
	Continues	2	33.3		2	9.5		
Having surgery for a body compatible with sexual identity	No	5	83.3		14	66.7		0.63
	Yes	1	16.7		7	33.3		
Legality of the surgery	Legal	0	0		4	50		
	Illegal	1	100		4	50		

DISCUSSION

In this study, it was aimed to determine the sociodemographic and clinical characteristics of the patients who were followed up in a university hospital psychiatry clinic with gender dysphoria and the differences between trans women and trans men.

The mean age of the cases included in this study was 25.7±6.9 years. The UK data show that the prevalence of gender dysphoria varies significantly between regions, and in regions that provide a more favorable environment for transgender individuals, the prevalence rate per 100,000 people aged 16 years and over is 45 and 43, respectively, compared to the national average of 20. In the same data, the average age of individuals who applied for treatment due to dissatisfaction with their gender was reported as 42 and it was stated that the reason for application at an advanced age may be the social pressure environment in the family and school (15). However, supporting our findings, a large-scale retrospective cohort study conducted in Australia reported that the median age at presentation among transgender individuals was 27 years, with a range from 16 to 74 years (16). In another multicenter study conducted in Türkiye involving 139 individuals, the mean age at presentation was found to be 27.7 years, with no significant age difference between trans women and trans men (17). Although this variation in average age may differ depending on cultural factors and healthcare delivery models, it suggests that most applications for gender-affirming care tend to cluster around the mid-twenties. Our study is also consistent with this pattern and further highlights that young adulthood represents a critical period for intervention and support. Another aspect of the findings of our study that is different from the literature is that the majority of the cases with gender dysphoria were trans men. In the studies investigating gender dysphoria in adults, it was reported that trans women were more common than trans men (18, 19). This difference may be due to the sociocultural male-dominated characteristics of the region where our study was conducted, differences in attitudes towards gender, and the acceptance of male gender being more acceptable than female gender. The cultural characteristics of the region where our study was conducted may lead to the fact that it is easier for trans men to seek treatment at an earlier age, while trans women may not seek treatment or prefer a more acceptable region. As a matter of fact, many studies have shown that transition to female role in the society is not as well received as transition to male role (20, 21).

In the studies conducted with different sampling and assessment methods in the literature, the prevalence of mental disorders that can be associated with stress, especially major depression and anxiety disorders, in individuals with gender dysphoria was found to be higher than the general population (10, 11). In this study, it was observed that 55.6% of transgender individuals had an additional psychiatric illness. Depression (66.7%) and anxiety disorder (13.3%) were the main additional diagnoses. This finding was supported by a cross-sectional study in transgender individuals in which clinical depression was found in 44.1%, anxiety in 33.2%, and high psychological stress level in 40.1% (22). In another study, it was reported that almost 70% of the final sample of 305 participants diagnosed with sexual identity disorder received one or more Axis I diagnoses throughout their lifetime, mainly mood and anxiety disorders (60% and 28%, respectively), and there was no significant difference between trans women and trans men in terms of diagnosis rates (23). Cultural factors and discrimination experienced by this minority group may be explanatory in terms of additional psychiatric disorders seen in this group.

In this study, it was determined that the rate of employment of trans men was higher than that of trans women, although that was not statistically significant. In addition, trans men stated that they were statistically significantly more approved by their coworkers than trans women. In support of these findings, in a study investigating the sociodemographic characteristics of transgender individuals who applied to psychiatry for sex reassignment surgery, it was shown that unemployment rates were higher in trans women compared to trans men (20). This can be explained by differences in the cultural view of the sexes and the fact that the male gender is more easily visible and more preferred in working life.

Previous trauma history was found to be statistically significantly higher in trans women compared to trans men. In previous studies, it was reported that individuals who were dissatisfied with their gender reported negative experiences in the form of aggression, hostility, verbal harassment and physical violence, and it was stated that especially trans women were met with a more negative attitude in their own environment and suicide rates were found to be higher in trans women than in trans men (24, 25).

The presence of suicidal ideation, which was evaluated in the clinical follow-up process of cases with gender dysphoria, was found to be statistically significantly higher in trans women than in trans men. In addition, it was observed that family support of trans women was lower than trans men, although that was not statistically significant. In the studies, it was reported that family support was very important in terms of healthy self-development and coping with discrimination and other stressor factors in individuals who were dissatisfied with their sexuality, and participants who reported that their families had a strict and restrictive attitude towards sexuality described significantly more suicidal thoughts in the past and during the interview compared to those who reported a positive-supportive attitude (21).

Considering from this point of view, it can be thought that family support, which was found to be lower in trans women compared to trans men, may contribute to suicidal thoughts, which were observed at a higher level in trans women compared to trans men during the follow-up period determined in this study. As a matter of fact, it was reported in many studies that trans individuals were verbally harassed by their families, relatives, coworkers and general public during the transition process (26, 27, 28).

The limitations of our study include retrospective planning, data being based on file information, limited number of cases and low number of trans women. However, based on the findings of this study, which includes current and real data from a university hospital, it may be recommended to develop more customized approaches to the gender differences of transgender individuals with larger-scale studies to be conducted in this field.

CONCLUSION

Although gender dysphoria is seen all over the world, the behavioral manifestations of the cases may differ from country to country and from culture to culture. In this study, cases admitted to a university hospital with gender dysphoria in a region with dominant cultural characteristics and where differences outside the general social acceptance can be difficult to accept were evaluated. Results of this study indicate that trans women and trans men have different experiences in terms of social acceptance, family support level, mental health risks such as suicide and trauma history, which are in favor of trans men. As a matter of fact, it seems that the difficulties related to being a woman in male-dominated societies also apply to the concept of gender dysphoria.

Differences in cultural hostility towards trans men and trans women, and differences in local peer, family and workplace support, may affect their willingness to seek medical help, leading trans women to seek treatment less often or to seek treatment in centers known to be more hospitable. There appear to be significant regional differences in the treatment-seeking processes of trans women and trans men. Further studies are needed to identify the underlying reasons for these differences.

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RESEARCH ARTICLE

Violence in Healthcare in Two Different Countries: A Study on Turkiye and Romania

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ABSTRACT

Objective: The aim of this study is to assess the issue of violence in healthcare from the perspective of physicians in Sivas, Turkiye, and Sibiu, Romania.

Method: This research was conducted as a descriptive study. The study population comprised 500 participants from Turkiye and 200 from Romania. A 23-item data collection form, developed by the researchers, was used. The form was divided into sections covering sociodemographic characteristics, history of exposure to violence, and perspectives on violence. The form was initially created in Turkish, translated into Romanian, and underwent content validity assessment. Data were analyzed using the SPSS 22.0 software, applying descriptive statistical analysis, chi-square tests, and independent samples T-tests.

Results: Of the participants, 44% were from Turkiye and 56% from Romania. The rate of exposure to violence in healthcare was found to be 76% in Turkiye and 44% in Romania. In Romania, the most frequent setting for violence was the emergency department (53.7%), while in Turkiye, violence occurred equally in emergency departments and outpatient clinics (46.5%). The proportion of physicians considering working abroad due to healthcare-related violence was 33% in Turkiye and 5% in Romania. Physicians in both countries recommended legal reforms and stricter penalties, enhancing security in healthcare facilities, raising public awareness, and improving communication as key measures to prevent violence in healthcare.

Conclusions: Violence in healthcare was identified as a significant issue in both countries. The locations and causes of violence were similar. Turkish physicians expressed a higher desire to emigrate due to violence in healthcare. It is essential for policymakers in both countries to urgently address the prevention of violence in healthcare.

Keywords: Violence, Exposure To Violence, Physicians, Turkiye, Romania.

İki Farklı Ülkede Sağlıkta Şiddet: Türkiye ve Romanya Üzerine Bir Araştırma

ÖZET

Amaç: Bu çalışmada Türkiye Sivas'ta ve Romanya Sibiu'da sağlıkta şiddeti doktorların gözünden değerlendirmek amaçlanmıştır.

Yöntem: Araştırmamız tanımlayıcı bir çalışmadır. Araştırma evreni Türkiye'den 500, Romanya'dan 200 kişiden oluşmaktaydı. Araştırmacılar tarafından oluşturulan 23 soruluk veri toplama formu kullanıldı. Formun bölümleri; sosyodemografik özellikler, şiddet öyküsü ve şiddete bakış açısı şeklindeydi. Form Türkçe olarak oluşturuldu, sonrasında Romence'ye çevrilip kapsam geçerliliği yapıldı. Veriler SPSS 22.0 paket programı ile analiz edildi. Tanımlayıcı analizler, ki-kare testi, bağımsız örneklem T testi kullanıldı.

Bulgular: Katılımcıların %44'ü Türkiye'den %56'sı Romanya'dandı. Sağlıkta şiddete maruz kalma oranı Türkiye'de %76, Romanya'da %44 olarak bulundu. Şiddetin yeri ise Romanya'da en sık acil servisler (%53,7) iken, Türkiye'de acil servis ve poliklinik eşit (%46,5) olarak bulundu. Sağlıkta şiddet nedeniyle yurt dışında çalışmayı düşünen hekimlerin oranı Türkiye'de %33, Romanya'da ise %5'di. Sağlıkta şiddeti önlemek için her iki ülkedeki hekimlerin de önerileri; yasaların düzenlenmesi ve cezai yaptırımların artırılması, sağlık kuruluşlarında güvenliğin artırılması, halkı bilinçlendirme ve iletişimin iyileştirilmesiydi.

Sonuç: Sağlıkta şiddetin her iki ülkede de sorun olduğu tespit edildi. Şiddetin yaşandığı birimler ve sebepleri benzerdi. Türk hekimlerin sağlıkta şiddet nedeniyle beyin göçü gerçekleştirme isteği daha fazlaydı. Her iki ülke için de politika yapıcıların sağlıkta şiddeti önlemek konusunu acil olarak gündeme alması gerekmektedir.

Anahtar Kelimeler: Şiddet, Şiddete Maruz Kalma, Doktorlar, Türkiye, Romanya.

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INTRODUCTION

Violence, one of the most significant problems faced by societies and seen in various sectors, is also prevalent in the healthcare field (1). According to the World Health Organization (WHO), violence is defined as physical assault, murder, verbal assault, emotional, sexual, or racial harassment. When considering workplaces, violence is observed to occur most frequently in the healthcare sector. A study highlighted that working in healthcare poses a sixteen times greater risk of experiencing violence compared to other industries (2). In this study, we adopt the following working definition of violence in healthcare institutions: “a situation involving threats, physical, or sexual assault coming from patients, their relatives, or any individual that poses a risk to healthcare workers.” Where violence exists, there are undoubtedly underlying causes, and these must be carefully addressed (3).

The causes of violence in healthcare include a lack of communication, the influence of media, inadequate healthcare infrastructure, patient-related sociocultural factors, excessive patient load, insufficient number of doctors, shortcomings in legal regulations, and security vulnerabilities. Health communication, one of the essential aspects of communication, is “the form of communication carried out by individuals or groups on health-related issues, directed towards target audiences.” The communication between healthcare workers and patients or their relatives cannot be evaluated independently of factors such as age, gender, education, socioeconomic, societal, and institutional factors. A lack of communication, one of the main causes of violence in healthcare, was identified as the most significant issue in a study (40.4%) (1). This communication gap can lead to legal disputes between doctors and patients. To minimize these issues, patients and their relatives should be thoroughly informed about medical interventions, clear communication should be established, and robust legal frameworks should be implemented in healthcare institutions. Media also plays a critical role in shaping public perception of violence in healthcare. The way incidents of violence against healthcare workers are reported, the frequent portrayal of such events, and the framing of medical malpractice cases contribute to the normalization of violence in society. Sensationalized reporting and the depiction of violence as a problem-solving method in movies and TV shows further reinforce this issue. Therefore, media ethics should be a guiding principle when deciding whether and how to report such incidents (1,4).

Another contributing factor is the reluctance of healthcare workers to file complaints after experiencing violence. Due to the low number of reports, driven by insufficient legal frameworks, the true extent of violence in healthcare remains unknown. Violence not only harms healthcare workers but also negatively affects the institution and other patients awaiting treatment. For healthcare workers to perform their duties effectively, they first and foremost need a safe working environment. Violence is not merely an attack that causes physical harm; it also leads to mental and emotional damage in individuals (1). According to the WHO, 8% to 38% of healthcare workers experience physical violence at some point in their careers. Healthcare workers are affected both psychologically and physically by such incidents, leading to a loss of job motivation. Consequently, violence against healthcare workers endangers the quality of care and disrupts the provision of healthcare services. It also results in significant financial losses for the healthcare sector (5).

The violence experienced by healthcare workers in Turkiye is also seen in other countries (1). In our study, we aimed to evaluate healthcare violence from the perspective of doctors in Sivas, Turkiye, and Sibiu, Romania.

MATERIAL AND METHODS

Study Type: This was a descriptive study.

Design: This study was conducted face-to-face in various departments of Sivas Cumhuriyet University (SCU) Hospital in Turkiye between February 2023, and May 2023, and Lucian Blaga University of Sibiu (LBUS) Hospital in Romania between February 2023, and March 2023. The study population consisted of a total of 700 individuals, with 500 participants from SCU and 200 from LBUS. No sample size calculation was performed in this study, as the aim was to include the entire population. All physicians were contacted and informed. The response rates were 17.2% for the center in Turkiye and 54% for Romania.

In this completed study, a post-hoc G-power analysis was conducted to determine the statistical power for a known population with an unknown prevalence. Based on this analysis, for a total population of 700, with an acceptable margin of error of 5%, and a sample size of 194, the confidence interval was determined to be 90%.

The research design and processes are shown in Figure 1 with a flow diagram.

Data Collection Tool: Participation in the study was based on voluntary consent. The exclusion criteria for the study were refusal to participate and incomplete completion of the questionnaire. The data collection tool used in the study consisted of 23 questions, which were developed by the researchers through a literature review. The first section of the questionnaire, composed of 8 questions, addressed sociodemographic characteristics; the second section, with 7 questions, explored participants’ history of exposure to violence; and the third section, with 8 questions, examined their perspectives on violence. One of the questions was open-ended, and thematic analysis was conducted for its evaluation.

The questionnaire was initially prepared in Turkish, then translated into English, and reviewed by three experts. After receiving approval from the experts, it was translated into Romanian by a Romanian researcher. This Romanian version was subsequently sent to three native Romanian-speaking experts for review and approval. The Turkish version of the form was used in Turkiye, and the Romanian version was applied in Romania.

Bias Reduction Strategies

Handling of Missing Data: Everyone who agreed to participate in the research completed the questionnaire completely.

Selection Bias: Since the study aimed to include all physicians in the selected hospitals, every eligible physician was contacted and informed about the study to encourage participation. However, participation was voluntary, which may have influenced response rates.

Reporting Bias: The questionnaire was designed based on a literature review to ensure comprehensiveness and neutrality. Participants were informed that their responses would remain anonymous, encouraging them to provide honest answers. Additionally, a mix of closed-ended and open-ended questions allowed for a more nuanced understanding of their experiences.

Translation Accuracy: To minimize any bias arising from language differences, the questionnaire underwent a rigorous translation and back-translation process, reviewed by multiple experts in both languages.

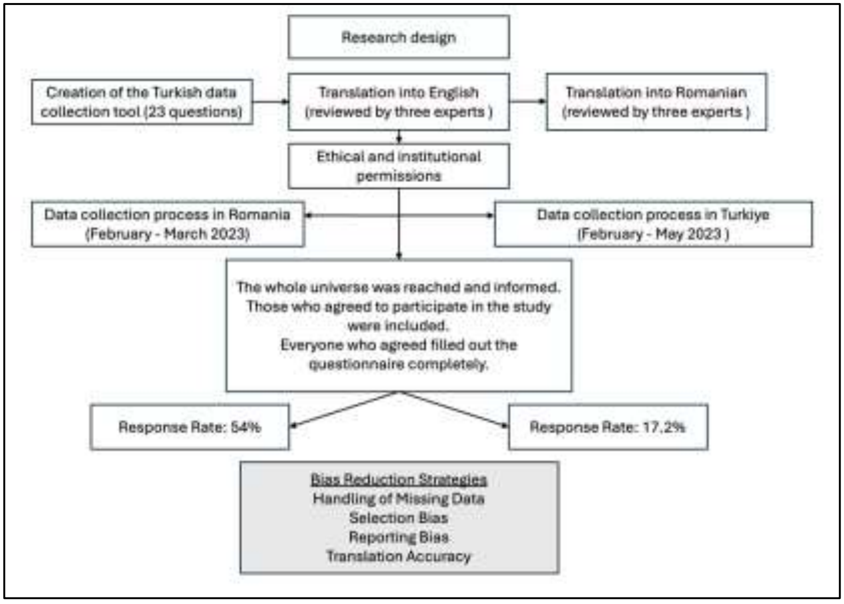

Figure 1. A flow diagram the research design and processes

Statistical Analysis: The data collected were analyzed using SPSS (Statistical Package for Social Sciences) package program for Windows version 22. The analysis of the skewness and kurtosis coefficients was used to determine whether the numerical data was adequate for a normal distribution. Most researchers (6, 7, 8) suggest that skewness and kurtosis values should be between -1 and +1 for normality, while some others propose a wider range (e.g., ±2) depending on the sample size. Considering the sample size in our study, we primarily followed Huck's (6) suggested criterion of -1 to +1; however, we acknowledge that alternative threshold values also exist. First, the data were evaluated by a descriptive statistical analysis. For numerical data, measures of central distribution (mean ± standard deviation) were determined, whereas frequencies were computed for categorical data. To compare categorical data, a chi-square test has been used. The T-test for independent samples was used to assess numerical data with normally distributed means that differed significantly between the two groups. With a 95% confidence interval, a p-value of less than 0.05 was accepted as statistically significant. For the evaluation of the open-ended question, two researchers developed codes and themes for the responses in Turkish, and a Romanian researcher did the same for the responses in Romanian. In a subsequent meeting involving all researchers, the final version of the themes was established, and decisions were made regarding which quotations would be included in the text.

Ethics Approval and Permissions: The study was approved by Sivas Cumhuriyet University Scientific Research and Publication Ethics Committee for Social and Human Sciences (approval date/number: 23.02.2023/E-99711239-050.04-268583). Approval to conduct the survey at LBUS was obtained from the dean of LBUS while approval for implementation at SCU was granted by the dean's office and hospital administration. Informed consent was obtained from all individual participants included in the study.

RESULTS

The average age of the 194 physicians participating in the study was 33.6 ± 8.2 years. Of the participants, 44.3% (n=86) were from Turkiye, and 55.7% (n=108) were from Romania. Regarding gender, 65.4% (n=125) of the physicians were female, and 34.6% (n=66) were male. Of the participants, 9.3% (n=18) were academics, 24.7% (n=48) were specialist doctors, and 66% (n=128) were resident doctors. In terms of specialties, 3.2% (n=6) were from basic sciences, 68.1% (n=128) from internal sciences, and 28.7% (n=54) from surgical sciences. The distribution of participants' demographic characteristics by country is shown in Table 1.

Table 1. The distribution of participants' demographic characteristics by country

	Turkiye		Romania		p
	n (%)	Mean ± SD	n (%)	Mean ± SD	
Age	-	32.6±7.7	-	34.3±8.6	0.142
Gender					
Female	45 (36.0)	-	80 (64.0)	-	**0.001**
Male	41 (62.1)	-	25 (37.9)	-	
Title					
Academician	18 (100)	-	0 (0)	-	**<0.001**
Specialist	5 (10.4)	-	43 (89.6)	-	
Resident	63 (49.2)	-	65 (50.8)	-	
Field of Specialization					
Basic Science	1 (16.7)	-	5 (83.3)	-	**0.036**
Internal Science	65 (50.8)	-	63 (49.2)	-	
Surgical Science	18 (33.3)	-	36 (66.7)	-	
Units*					
Emergency	28 (49.1)	-	29 (50.9)		0.431
Polyclinic	74 (54.8)		51 (45.2)		**<0.001**
Operation Room	19 (52.8)		17 (47.2)		0.180
Laboratory	1 (11.1)		8 (88.9)		**0.037**
Intensive Care	22 (71)		9 (29)		**0.001**
Primary Care	6 (54.5)		5 (45.5)		0.544
Inpatient care	29 (65.9)		15 (34.1)		**0.002**

* A person can work in more than one unit.

In Romania, 64.8% of participants (n=70) were satisfied with their specialty, while 32.4% (n=35) were partially satisfied. In Turkiye, the satisfaction rate with the specialty was 64.0% (n=55), and the rate of those who were partially satisfied was 31.4% (n=27). Satisfaction with the specialty was similar in both countries (p=0.784). Among the participants, 32.6% (n=28) in Turkiye and 13.0% (n=14) in Romania reported that they would change their specialty if given the opportunity (p=0.001).

The rate of participants in Romania who experienced violence in healthcare was 44.4% (n=48), whereas it was 75.6% (n=65) among participants in Turkiye. There was a significant difference in the experience of violence in healthcare between participants from the two countries (p<0.001). The frequency of experiencing violence from colleagues was 37.0% (n=40) in Romania and 80.2% (n=69) in Turkiye (p<0.001). When asked which gender of colleagues the violence they witness at work affects the most, Turkish physicians said they thought that female (36.2%) and male (31.9%) physicians were exposed to violence almost equally. In contrast, most physicians in Romania preferred not to specify gender (p=0.001). The incidence of violence in healthcare institutions in the past year was 52.8% (n=57) in Romania and 74.4% (n=64) in Turkiye (p=0.002). The frequency of verbal violence experienced by physicians in Turkiye was higher than that of physicians in Romania (p<0.001). There was no significant difference in the frequency of physical violence experienced (p=0.274). The units where violence was witnessed were more common in clinics and primary care settings in Turkiye compared to Romania, while in Romania, it was more frequent in operating rooms than in Turkiye. The data are presented in detail in Table 2.

The frequencies of hearing about violence in healthcare in the media were found to be 47.8% (n=32) daily, 35.8% (n=24) weekly, 11.9% (n=8) monthly, and 4.5% (n=3) very rarely in Turkiye. In Romania, these figures were 10.4% (n=11) daily, 17% (n=18) weekly, 31.1% (n=33) monthly, and 41.5% (n=44) very rarely. There was a significant difference between the two countries regarding the frequency of hearing about violence in healthcare in the media (p<0.001).

Table 2. The rates of exposure to violence in healthcare by country

	Turkiye		Romania		
	n (%)	Mean ± SD	n (%)	Mean ± SD	p
Personal exposure to violence		-		-	
Yes	65 (75.6)		48 (44.4)		<0.001
No	21 (24.4)		60 (55.6)		
Violence incidents in the institution in the last year		-		-	
Yes	64 (74.4)		57 (52.8)		0.003
No	22 (25.6)		51 (47.2)		
Violence exposure of colleagues		-		-	
Yes	69 (80.2)		40 (37.0)		<0.001
No	17 (19.8)		68 (63.0)		
Gender of colleague exposed to violence					
Female	25 (36.2)	-	7 (18.9)	-	0.001
Male	22 (31.9)	-	7 (18.9)	-	
Both	7 (10.1)	-	1 (2.7)	-	
Not specified	15 (21.7)	-	22 (59.5)	-	
Profession of colleague exposed to violence					
Medical doctor	50 (72.5)	-	19 (47.5)	-	0.007
Other healthcare personnel	4 (5.8)	-	0 (0)	-	
Other personnel	1 (1.4)	-	2 (5.0)	-	
Not specified	14 (20.3)	-	19 (47.5)	-	
The rate of personal exposure to violence					
Verbal					
None	16 (19.3)		64 (59.3)		<0.001
Five or less than five	41 (49.4)		23 (21.3)		
More than five	26 (31.3)		21 (19.4)		
Physical	17 (19.8)	1.7 ±1.4	10 (9.3)	2.9 ±3.7	0.274
The rate of witnessed healthcare violence					
Verbal					
None	29 (34.9)		63 (58.3)		0.003
Five or less than five	23 (27.7)		20 (18.5)		
More than five	31 (37.3)		25 (23.1)		
Physical		2.7±2.4		1.5±0.8	0.030
The units where witnessed violence in healthcare*					
Emergency	40 (46.5)		58 (53.7)		0.197
Polyclinic	40 (46.5)		11 (10.2)		<0.001
Operation Room	0 (0)		9 (8.3)		0.004
Laboratory	0 (0)		2 (1.9)		0.504
Intensive Care	6 (7.0)		4 (3.7)		0.343
Primary Care	9 (10.5)		3 (2.8)		0.036
Inpatient care	10 (11.6)		5 (4.6)		0.062
Other	1 (1.2)		1 (0.9)		0.871

* A person can work in more than one unit.

Physicians were asked to assess the extent to which violence in healthcare was a problem in their countries using a 10 cm visual analog scale (VAS). The VAS score for physicians in Turkiye was 9.25±1.6, while for those in Romania, it was 4.29±2.4 ($p<0.001$). Their concerns about experiencing violence while providing healthcare services were also assessed using the VAS. The average score for physicians in Turkiye was found to be 7.53±0.3, whereas the average for physicians in Romania was 3.69±2.7 ($p<0.001$).

The proportion of those considering practicing medicine abroad due to violence in healthcare was 32.6% (n=28) in Turkiye and 4.6% (n=5) in Romania ($p<0.001$). Among Turkish physicians who expressed a desire to go abroad, 37.5% (n=9) indicated a preference for Scandinavian countries, 25.0% (n=6) for Germany, 12.5% (n=3) for the United Kingdom, 4.2% (n=1) for the United States, and 16.7% (n=4) for other countries. In Romania, among those wishing to go abroad for this reason, 20% (n=1) preferred the United States, and another 20% (n=1) preferred other countries.

In Turkiye, 87.2% (n=75) of physicians believed that violence in healthcare had increased over the years, while 12.8% (n=11) thought it had not changed. In Romania, 36.1% (n=39) of physicians believed it had increased, 46.3% (n=50) thought it had not changed, and 17.6% (n=19) believed it had decreased ($p<0.001$). Regarding the causes of violence in healthcare in Turkiye, physicians attributed responsibility in order of frequency: inadequacy of legal regulations, security deficiencies, sociocultural factors, excessive patient load, insufficient healthcare infrastructure, lack of communication, insufficient quantity of physicians, and insufficient quantity of healthcare personnel. In Romania, the causes were attributed in order of frequency: sociocultural factors, insufficient quantity of healthcare personnel, insufficient quantity of physicians, insufficient healthcare infrastructure, lack of communication, inadequacy of legal regulations, security deficiencies, and excessive patient load. The physicians' opinions on the causes of violence in healthcare in their countries are presented in Table 3.

Table 3. The physicians' opinions on the causes of violence in healthcare in their countries

Reasons	Turkiye n (%)	Romania n (%)	p
Insufficient healthcare infrastructure			
Yes	61 (70.9)	61 (56.4)	0.070
Partially	17 (19.7)	33 (30.5)	
No	8 (9.3)	14 (12.9)	
Sociocultural factors			
Yes	79 (91.8)	89 (82.4)	0.040
Partially	7 (8.1)	17 (15.7)	
No	0 (0)	2 (1.8)	
Lack of communication			
Yes	55 (63.9)	59 (54.6)	0.347
Partially	27 (31.3)	40 (37)	
No	4 (4.6)	9 (8.3)	
Excessive patient load			
Yes	76 (88.3)	17 (15.7)	<0.001
Partially	10 (11.6)	49 (45.3)	
No	0 (0)	42 (38.8)	
Insufficient quantity of healthcare personnel			
Yes	53 (61.6)	66 (61.2)	0.369
Partially	22 (25.5)	34 (31.4)	
No	11 (12.7)	8 (7.4)	
Insufficient quantity of physicians			
Yes	53 (62.3)	66 (61.2)	0.880
Partially	21 (24.7)	31 (28.7)	
No	11 (12.9)	11 (10.1)	
Inadequacy of legal regulations			
Yes	81 (94.1)	54 (50)	<0.001
Partially	4 (4.6)	41 (37.9)	
No	1 (1.1)	13 (12.1)	
Security deficiencies			
Yes	80 (93)	54 (50)	<0.001
Partially	5 (5.8)	36 (33.3)	
No	1 (1.1)	18 (16.7)	

“16.3% (n=14) of physicians in Turkiye and 3.7% (n=4) of physicians in Romania identified other factors as causes of violence in healthcare. In Turkiye, the additional factors included the media targeting healthcare professionals, the free healthcare system, and the absence of a referral system. In Romania, the additional factors were the media targeting healthcare professionals, psychiatric patients, and unnecessary visits to emergency departments.

Responses to the open-ended question ‘What regulations and changes can be made to prevent violence?’ were classified according to countries, and codes and themes were developed. The themes that emerged for each country are shown in Table 4.

Table 4. The themes that emerged for each country

Turkiye	**Romania**
Legal regulations and punitive measures	Legal regulations and punitive measures
Security-enhancing regulations in healthcare institutions	Security-enhancing regulations in healthcare institutions
Awareness and communication	Awareness and communication
Factors affecting examination time and referral system	Factors affecting examination time and efficient triage implementation
Professional prestige	Professional prestige
	The presence of an on-call psychiatrist in emergency departments

When the codes under the themes in Turkiye were examined:

1.Legal regulations and punitive measures: Physicians recommended that the laws be clear, strict, and enforceable. They suggested that European laws on violence in healthcare should serve as a model and that all penalties should be applied without suspension. As punitive measures, they proposed prison sentences, financial penalties, restricting the perpetrator’s right to receive healthcare in that institution or city, or completely barring access to healthcare, and removing them from social security coverage. They also mentioned that news about the penalties given to perpetrators of violence could be published in the media as a deterrent.

2.Security-enhancing regulations in healthcare institutions: Turkish physicians recommended the assignment of police officers to work in hospitals and increasing the effectiveness of hospital security personnel. They suggested increasing security measures such as placing x-ray machines at hospital entrances to prevent sharp and piercing objects from entering healthcare facilities. They also proposed limiting the number of companions allowed with patients and prohibiting individuals without an appointment from entering the hospital.

3.Awareness and communication: They suggested teaching topics such as communication, hospital procedures, empathy, and health literacy to the public, starting in elementary school, and developing projects for this purpose. They noted that the use of appropriate language by politicians could have a positive impact on society. Additionally, they recommended adding courses during the pre-graduation period to improve communication skills for healthcare professionals.

4.Factors affecting examination time: Physicians emphasized that examination times are too short, and patient loads are too high. To address this, they suggested adjusting working hours, extending examination times, and increasing the number of healthcare staff. They also mentioned that limiting the number of daily patients could help reduce waste in healthcare. Furthermore, they suggested introducing a referral system and strengthening primary care to prevent unnecessary patient referrals to secondary and tertiary care levels.

5.Professional prestige: They recommended preventing derogatory portrayals of doctors in the media and urged that politicians and other influential individuals refrain from using language that undermines respect for healthcare professionals.

When the codes under the themes in Romania were examined:

1.Legal regulations and punitive measures: They recommended tightening legal regulations and ensuring their strict enforcement. They also suggested banning violent behavior and removing perpetrators from healthcare institutions.

2.Security-enhancing regulations in healthcare institutions: They recommended placing security cameras in hospitals and regularly monitoring them. They noted that the presence of police officers and security personnel in healthcare institutions could help prevent violence. Additionally, they proposed installing panic buttons in clinic rooms to facilitate effective intervention in case of an attack. They suggested limiting the number of companions allowed with patients and adding a warning note to the medical records of patients who had previously displayed aggressive behavior in healthcare settings.

3.Awareness and communication: They proposed educating patients about their responsibilities, behavioral rules, and the importance of communication in hospitals and conducting awareness sessions on these topics.

4.Factors affecting examination time: They recommended preventing overcrowding in healthcare institutions, limiting the number of appointments, increasing the number of healthcare staff, creating suitable work schedules for healthcare personnel, and implementing effective triage to reduce patient waiting times.

5.Professional prestige: They recommended ending the negative portrayal of healthcare professionals in the media to boost ratings and avoiding approaches that undermine respect for healthcare professionals.

6.On-call psychiatrist in emergency departments: They suggested creating a separate psychiatry unit in emergency departments and employing psychiatrists on a shift basis.

DISCUSSION

As noted by the WHO, violence in healthcare is a global issue (5). According to the data, between 8% and 38% of healthcare workers experience physical violence, and even higher rates experience threats and verbal abuse (9). Studies conducted in different countries have confirmed the high prevalence of workplace violence in healthcare. For example, in Australia, 72% of healthcare workers reported experiencing workplace violence (10), while another study found that 65% of nurses, 42% of occupational therapists, and 27% of physiotherapists were exposed to violence annually (11). Similar patterns have been observed in Italy, China, and Romania, where significant proportions of healthcare workers report exposure to violence (12–14).

In our study, 75.6% of doctors in Turkiye and 44.4% in Romania reported experiencing violence, highlighting that violence in healthcare is a widespread and pressing issue (1). Comparisons with other countries indicate that healthcare violence is not limited to specific regions. In the U.S., the rate of physical violence against physicians is four times higher than in any other profession (15), and in Germany, 94.1% of healthcare workers reported verbal abuse, with 33.3% experiencing psychological distress as a result (16).

Among Iranian nurses, the prevalence of verbal, physical, sexist, and racist violence, as well as threats, was found to be 81%, 25%, 7%, 15%, and 44%, respectively (17). Ayrancı’s study (18) found that 69.5% of doctors had experienced verbal violence, while Hostiuc et al. reported that 93.4% of intern doctors had experienced psychological violence and 19.6% had experienced physical violence (14).

Our study found that 19.8% of doctors in Turkiye and 9.3% in Romania reported experiencing physical violence, whereas the rates of verbal violence were significantly higher, at 80.7% in Turkiye and 40.7% in Romania. Current literature indicates that female healthcare workers are disproportionately harmed by violence (19,20), even though both Turkish and Romanian physicians stated that violence affects male and female physicians equally. The higher incidence of verbal violence against female healthcare workers may be attributed to the perception that women are more vulnerable, their responses are less assertive compared to men, and their reactions are often met with sensitivity due to the patriarchal nature of society (21).

The emergency department was identified as the most frequent site where violence occurred in both Turkiye (46.5%) and Romania (53.7%). Previous studies have consistently highlighted emergency departments as high-risk settings for violence (18,20,22). Additionally, Turkish physicians in our study reported experiencing more frequent violence in outpatient clinics and primary care compared to their Romanian counterparts. This aligns with findings from previous research in Turkiye, where the lifetime prevalence of violence among family physicians in primary care was reported as 82% (23).

Factors contributing to violence in healthcare settings include high patient loads, staff shortages, long waiting times, demanding patient behavior, and communication issues (1,22). In our study, Turkish physicians most frequently cited insufficient legal regulations and security deficiencies as the primary causes of violence. In contrast, Romanian physicians emphasized sociocultural factors and the shortage of healthcare personnel as the main contributing factors. These findings are consistent with previous research, which has highlighted the role of weak legal enforcement and systemic healthcare challenges in exacerbating workplace violence (20).

It is also acknowledged that the media has a significant impact on how the general public views healthcare violence. In this study, Turkish physicians reported significantly higher exposure to media coverage of healthcare violence compared to their Romanian counterparts. Sensationalized media report coverage of violence may contribute to normalizing it and lessen the perceived seriousness of assaults on medical personnel (1). Responsible journalism should aim to frame such incidents to discourage violence rather than reinforce it.

In this study, Turkish physicians most frequently cited insufficient legal regulations and security deficiencies as the primary causes of violence. In contrast, Romanian physicians most frequently pointed to sociocultural factors and the shortage of healthcare personnel and doctors. Physicians in both countries recommended strengthening legal regulations, increasing punitive measures, enhancing security in healthcare facilities, raising public awareness, and improving communication between healthcare professionals and patients. While similar suggestions were made in Romania, they also proposed the presence of on-call psychiatrists in emergency departments. Data on violence against physicians in Romania was limited in the literature. Carra attributes this to the fact that, prior to the 1989 Romanian Revolution, authorities considered presenting statistics that could damage the country's image as "inappropriate," and studies on this issue increased after the 2006 Health Reform Law was enacted (24).

The migration of physicians due to workplace violence has emerged as a growing concern, particularly in Turkiye. Factors such as high patient volume, excessive workloads, long working hours, wage disparities, limited opportunities for education, research, and career development, and most notably, the increasing incidents of violence against physicians are cited as the main reasons driving doctors to emigrate (25). In Ünlü's study, 63% of medical students expressed their intention to work abroad in the future (26). In our study, the percentage of physicians considering leaving their country due to healthcare violence was 33% in Turkiye and 5% in Romania, demonstrating a statistically significant difference between the two countries.

Family physicians play a crucial role in providing holistic, continuous care. Gökdemir (27) emphasized that the increasing violence in healthcare could be mitigated through policies that align with the "holistic model" and "comprehensive approach" fundamental principles of family medicine. Family physicians deal with all health-related physical, mental and social conditions of the patient within the scope of holistic care. The family physician is in the best position to ensure continuity of care because he/she knows the patient's past life, problems, illnesses, past and current medications, and the patient's lifestyle thanks to the opportunity provided by the long-term patient-physician relationship and is ready to cooperate with secondary and tertiary healthcare institutions if requested. One of the pillars of this problem can be solved by increasing the respected position of family physicians in society and strengthening their opportunities rather than restricting them.

CONCLUSION

Violence in healthcare is a global issue. In our study, the views of physicians from Turkiye and Romania were collected. The rate of exposure to violence was found to be significantly different between the two countries: 44% in Romania and 76% in Turkiye. Verbal violence was more frequently observed in Turkiye. In terms of the locations of violence, emergency departments were the most common setting in Romania, while in Turkiye, violence was equally common in emergency departments and outpatient clinics. Turkish physicians felt that media coverage of healthcare violence was more frequent. The percentage of physicians considering working abroad due to violence was 33% in Turkiye and 5% in Romania. Turkish physicians attributed the high frequency of violence to inadequate legal regulations and security shortcomings, whereas Romanian physicians most often pointed to sociocultural factors and the insufficient number of healthcare personnel and doctors. To prevent healthcare violence, physicians in both countries proposed strengthening legal regulations and punitive measures, enhancing security in healthcare facilities, raising public awareness, and improving communication.

Limitation

A single center was included in the study from each country; therefore, the results cannot be generalized to the entire population of either country. Another limitation is the low participation rate of Turkish physicians, which may be attributed to their heavy workload, leaving them unwilling to allocate time for the study. Additionally, some physicians may have been reluctant to discuss violence due to the negative experiences they have encountered. This low participation rate may have affected the study results.

Our study aimed to compare the perception of violence in healthcare among physicians in two different countries and provides important results. However, further investigation of the underlying causes could deepen the analysis. Focus group interviews with qualitative methods are recommended for future studies.

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RESEARCH ARTICLE

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Evaluation of Variations of the Chorda Tympani Nerve Originating from The Facial Nerve on High Resolution CT

ABSTRACT

Objective: The aim of this study is to define the anatomical variations of the chorda tympani nerve originating from the facial nerve on high resolution CT (HRCT).

Method: A retrospective study of 100 patients who underwent temporal bone HRCT imaging in Duzce University, Department of Radiology. Individuals with normal bone structure at least on one side, were included in the study. Multiplanar reconstruction images were created then chorda tympani was imaged and measurements were performed.

Results: Thirty-seven bone were excluded. When the originating localizations of the chorda tympani from the facial nerve were examined, 19(11.7%) anterior, 85(52.1%) anterolateral, 55(33.7%) lateral and 4(2.5%) posterolateral origins. The distance from the origin of the chorda tympani to the stylomastoid foramen was measured as 3.7±1.6 mm. The originating angle of the chorda tympani from the facial nerve was measured as 28.2±10.7º. The widest distance between the chorda tympani and the mastoid segment of the facial nerve was measured as 2.3±0.6mm. The furthest distance between the mastoid segment of the facial nerve and chorda tympani is inversely correlated with the distance between chorda tympani and stylomastoid foramen. The angle of originating chorda tympani from facial nerve is directly correlated with the distance between chorda tympani and stylomastoid foramen. The ratio of extratemporal branching of chorda tympani is %2.4.

Conclusions: The chorda tympani can be clearly seen on axial and reformat images on HRCT. Preoperative evaluation of the chorda tympani nerve might help to plan the surgical approach and thus prevent iatrogenic injury during middle ear surgery.

Keywords: Chorda Tympani, High Resolution CT, Facial Nerve, Posterior Tympanotomy, Facial Recess, Temporal Bone.

Korda Timpani’nin Fasiyal Sinirden Çıkış Varyasyonlarının Yüksek Çözünürlüklü BT’ de Değerlendirilmesi

ÖZET

Amaç: Bu çalışmanın amacı, fasiyal sinirden köken alan korda timpani sinirinin anatomik varyasyonlarını yüksek çözünürlüklü BT'de (HRCT) tanımlamaktır.

Yöntem: Düzce Üniversitesi Radyoloji Anabilim Dalı'nda temporal kemik HRCT görüntülemesi yapılan 100 hastanın görüntüleri retrospektif olarak değerlendirildi. En azından bir tarafta normal kemik yapısına sahip bireyler çalışmaya dahil edildi. Multiplanar rekonstrüksiyon görüntüleri oluşturulduktan sonra korda timpani görüntülendi ve ölçümler yapıldı.

Bulgular: 37 kemik çalışma dışında tutuldu. Korda timpaninin çıkış lokalizasyonları incelendiğinde, 19 (%11.7) anterior, 85 (%52.1) anterolateral, 55 (%33.7) lateral ve 4 (%2.5) posterolateral orijinliydi. Korda timpaninin çıkışından stilomastoid foramene kadar olan mesafe 3.7±1.6 mm olarak ölçüldü. Korda timpaninin fasiyal sinirden çıkış açısı 28.2±10.7º olarak ölçüldü. Korda timpani ile fasiyal sinirin mastoid segmenti arasındaki en geniş mesafe 2.3±0.6 mm olarak ölçüldü. Fasiyal sinirin mastoid segmenti ile korda timpani arasındaki en uzak mesafe, korda timpani ile stilomastoid foramen arasındaki mesafe ile ters orantılıdır. Korda timpaninin fasiyal sinirden çıkış açısı, korda timpani ile stilomastoid foramen arasındaki mesafe ile doğrudan ilişkilidir. Korda timpaninin ekstratemporal dallanma oranı %2.4' tür.

Sonuç: Korda timpani, HRCT'de aksiyel ve reformat görüntülerde açıkça görülebilir. Korda timpani sinirinin ameliyat öncesi değerlendirilmesi, cerrahi yaklaşımı planlamaya ve böylece orta kulak cerrahisi sırasında iatrojenik yaralanmayı önlemeye yardımcı olabilir.

Anahtar Kelimeler: Korda Timpani, Yüksek Çözünürlüklü BT, Fasiyal Sinir, Posterior Timpanotomi, Fasiyal Reses, Temporal Kemik.

INTRODUCTION

Chorda tympani is the largest intratemporal branch of the facial nerve. It branches from the mastoid segment of the facial nerve, and this branching is extremely variable. Chorda tympani receives the sense of taste of the anterior 2/3 of the tongue and also provides parasympathetic innervation of the submandibular and sublingual glands. Iatrogenic damage to the chorda tympani is a well-known complication that develops after middle ear surgery (1). Damage causes taste disturbance and dry mouth (2). Because of its clinical importance and variation, chorda tympani should be evaluated on CT before surgery.

In this study, temporal bone high-resolution computed tomographies taken in our hospital were retrospectively scanned, and patients with normal middle-inner ear structure and ossicular chain were included in our study. The aim of this study is to help prevent injuries that may occur during middle ear surgeries by defining the distance of chorda tympani from the stylomastoid foramen, the furthest distance between the chorda tympani and the mastoid segment of the facial nerve, the branching angle of the chorda tympani from the facial nerve, the branching localization of the chorda tympani in the axial plane, whether the measurements are different in terms of gender and right-left.

MATERIAL AND METHODS

Ethics Approval: This retrospective study was approved by our institutional ethics committee (Decision number: 2015/72) and carried out according to the requirements of the Declaration of Helsinki. Informed consent was waived because of the retrospective nature of the study.

Patients: For our study, high-resolution computed tomography (HRCT) examinations performed in the Department of Radiology, Faculty of Medicine, Düzce University were retrospectively reviewed. Individuals with normal middle and inner ear structure were included in the study group, those with congenital temporal bone anomaly, those who had previous temporal bone surgery, those with middle-inner ear and mastoid region pathologies (infection, trauma, tumor) and those with incompatible imaging parameters or artifacts on extraction were excluded. 100 individuals that meet all these criteria and can represent the normal population have been reached.

Computed Tomography Protocol: Temporal bone imaging examination was performed using a multidetector CT with the following parameters: 300 mAs, 120 kVp, a slice thickness of 0.5 mm, field-of-view 24 cm x 24 cm. The obtained 0.5 mm thick axial images were processed on the workstation and multiplanar reformatting (MPR) images were obtained. The evaluation was made by angling the axial, sagittal and coronal sections to best see them.

CT Reviewing: Images of the temporal bones were displayed using an DICOM Viewer. In the evaluation, first the styloid process was found in the axial plane and the stylomastoid foramen was visualized by following it. Then, the mastoid part of the facial nerve was followed and the branching of the chorda tympani was observed and the branching location was recorded. By following the anterolateral course of the chorda tympani in axial sections, the widest distance between the medial border of the chorda tympani and the lateral border of the facial nerve was measured. Then, reformat images were created, the mastoid part of the facial nerve was rotated around its own axis so that it was vertical, a plan in which the branching angle of the chorda tympani was most clearly visible was obtained, and the branching angle was measured. Finally, the exact point where the borders of the stylomastoid foramen formed was determined and the distance of the branching point of the chorda tympani to the stylomastoid foramen was recorded.

Statical Anaysis: Statistical analyses were performed with SPSS 22.0 (IBM Inc., Chicago, Illinois, USA). To compare the groups, Independent Samples t test was used for two groups and One-Way ANOVA was used for three or more groups. The difference between right and left measurements was examined with Paired Samples t test. Relationships between categorical variables were examined with the Fisher-Freeman-Halton test. Correlations between continuous variables were examined with Pearson correlation analysis. Statistical differences were considered significant with $P < 0.05$.

RESULTS

One hundred patients who underwent CT of the temporal bone were included in the study. A total of 163 temporal bones in 100 patients were evaluated. The median age was 36 years and 57% (n = 57) of patients were women. There was no significant difference between the genders in terms of age (P = 0.57). The localization of branching of the chorda tympani from the facial nerve was observed anterior in 19 (11.7%), anterolateral in 85 (52.1%), lateral in 55 (33.7%), and posterolateral in 4 (2.5%) (Table 1).

Table 1. Distribution of branching localization of chorda tympani from facial nerve

Localization	Number	Percentage (%)
Anterior	19	11.7 %
Anterolateral	85	52.1 %
Lateral	55	33.7 %
Posterolateral	4	2.5 %
Total	**163**	**100 %**

There was no significant difference between the two genders in terms of the localization of the branching of the chorda tympani from the facial nerve (p=0.7). The distance of the branching point of the chorda tympani to the stylomastoid foramen was 3.7±1.6 mm, the branching angle of the chorda tympani from the facial nerve was 28.2º±10.7, and the widest distance between the chorda tympani and the mastoid segment of the facial nerve was 2.3±0.6 mm. The distance of the branching point of the chorda tympani from the facial nerve to the stylomastoid foramen was 4.18±1.66 mm in males and was statistically significantly higher than in females (p=0.002) (Table 2). There was no significant difference between the genders in other measurements. There is a weakly significant inverse correlation between the largest distance between chorda tympani and facial nerve and the distance of the branching point of chorda tympani from the facial nerve to the stylomastoid foramen (r=-0.42, p<0.001). There is a weakly significant same-way correlation between the branching angle of the chorda tympani from the facial nerve and the distance from the branching point of the chorda tympani to the stylomastoid foramen (r=0.38, p=0.001). The distance of the anterior branching nerves to the stylomastoid foramen was significantly higher than the other localizations (p=0.009).

Table 2. Variables in measurements depending on gender

Variable	Gender	Number	Mean	Standart Deviation	p
Distance (mm)	Female	91	3.38 mm	1.63	**0.002**
	Male	72	4.18 mm	1.66	
Aperture (mm)	Female	94	2.34 mm	0.62	0.623
	Male	73	2.29 mm	0.61	
Angle (º)	Female	91	29.14º	10.50	0.237
	Male	72	27.13º	11.01	

Distance: *Distance of the branching point of the chorda tympani to the stylomastoid foramen.* ***Aperture:*** *Widest distance between the chorda tympani and the mastoid segment of the facial nerve.* ***Angle:*** *Branching angle of the chorda tympani from the facial nerve*

DISCUSSION

Nowadays, helical CT is the gold standard in temporal bone imaging because it has a high ability to show bone structures (3). Evaluation of the middle and inner ear on CT is very important for detecting pathologies, and evaluation with CT is becoming increasingly important before very sensitive ear surgeries (4).

Although it has been reported that chorda tympani can be detected on high-resolution CT, there are few studies on its sensitivity and accuracy. In a study conducted by Parlier-Cuau et al., it was stated that the detection of chorda tympani in high-resolution CT was best seen in axial sections, and the detection rate was reported to be as low as 71% (5). We were able to detect chorda tympani in all the bones we examined. The reason why the rate was so low in the study conducted by Parlier-Cuau et al. may be that the sections were taken wide because the protocol used in that study was 300mA, 130 kVp, 1.2 mm section thickness. Although mA and kVp values are similar to our study, the section thickness is quite high. For this reason, taking the section thickness of 0.5 mm, as we did, may be sufficient to detect chorda tympani.

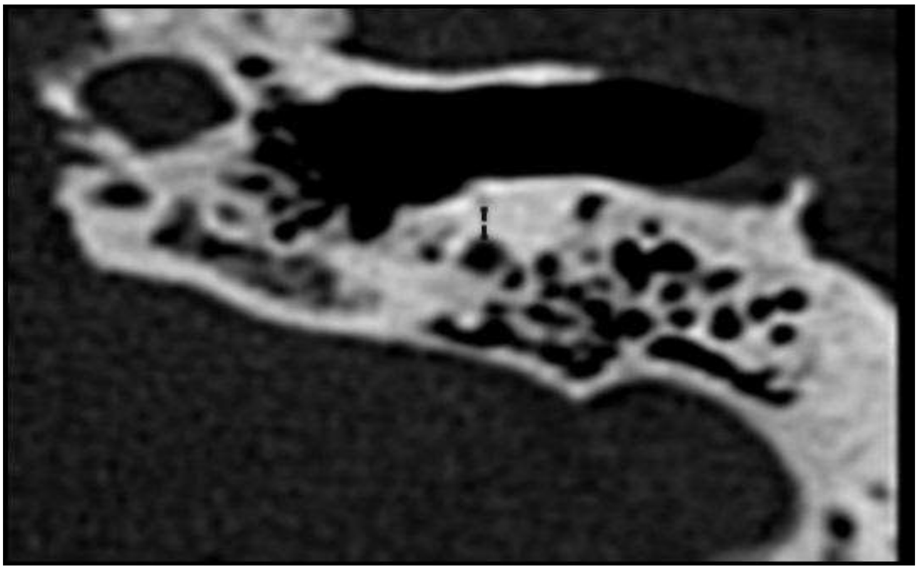

Figure 1. Measurement of the distance between the chorda tympani and the facial nevre.

Facial recess is defined as the widest distance between the chorda tympani and the facial nerve (Figure 2). This distance varies for each patient. Therefore, this area should be evaluated before middle ear surgeries. In our study, facial reses was measured 2.3±0.6 mm. In the literature, this distance was measured 1.4±0.7 mm by Dalveer Singh et al. (4), 2.9±0.7 mm by Lauren J. McManus et al. (1), and 3.6±0.2 mm by Eun-Ju Jeon et al. (6). There is no statistically significant difference between the two temporal bones in terms of facial recess. Dalveer Singh et al. also reported that there was no statistically significant difference between the two sides (4). Therefore, if the chorda tympani can not be clearly displayed on one side for various reasons, the opposite side can be taken as a reference (4). However, it should be kept in mind that in cases that cause mastoid sclerosis, such as chronic otitis media, the facial recess may be narrower than the normal side (7).

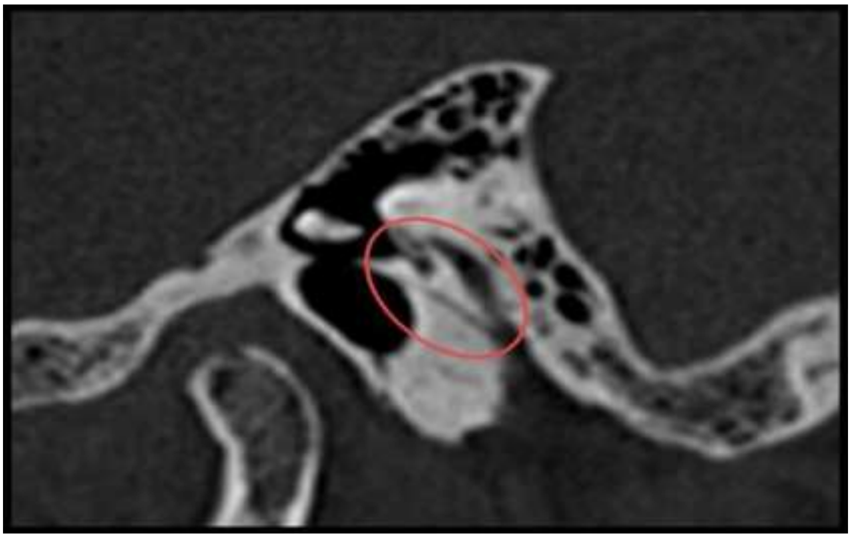

Figure 2. Facial recess

If the distance between the chorda tympani and the vertical part of the facial nerve is 1 mm or less, it is considered a narrow facial recess (8). A narrow facial recess makes cochleostomy difficult and may cause damage to the facial nevre (6). In a study of 1402 patients, Line Wang et al. reported that 39 patients had narrow facial recess, of which 22 patients had a facial recess width of 0.7-0.8 mm, and 17 patients reported that it was 0.8-1.0 mm (8). We measured the facial recess as 0.9-1.0 mm in 4 of the 100 patients we included in our study. Detecting the narrow facial recess before the operation and deciding which surgical technique will be applied will help to prevent intraoperative facial nerve or chorda tympani damage.

In our study, a weakly significant inverse correlation was found between the distance between the chorda tympani and the facial nerve mastoid segment and the distance from the branching point of the chorda tympani to the stylomastoid foramen. In other words, the closer the chorda tympani branching point is to the stylomastoid foramen, the greater the width of the facial recess. Similarly, Dalveer Singh et al. concluded in their study that the lower the chorda tympani branches in the temporal bone, the wider the distance between the chorda tympani and the mastoid segment of the facial nerve (4).

While the labyrinthine and tympanic segments of the facial nerve do not lengthen with age, the mastoid segment does. The mastoid part of the temporal bone also grows with age. Since the growth rate of the mastoid bone is higher than the growth rate of the mastoid segment of the facial nerve, the branching of the chorda tympani, which is extratemporal at birth, is located intratemporal in adulthood. Since the development of the mastoid part varies among individuals, the distance of the branching point of the chorda tympani to the stylomastoid foramen is also variable (9). We found the distance of the branching point of the chorda tympani to the stylomastoid foramen as 3.7±1.6 mm. This distance was found as 4.02 mm (9), 3.2 mm (1), 2.67 mm (10), 3.17 mm (11), 5.3 mm (12), 4.8 mm (13) in previous studies. There may be two reasons why there are such different values; Firstly, it may be due to the difference in measurement technique. Because in most previous studies, measurements were made without the definition of stylomastoid foramen. We considered the non-defective point where the facial nerve enters the temporal bone from the neighborhood of the styloid process, and whose borders are completely surrounded by bone structure, as the stylommastoid foramen (Figure 3).

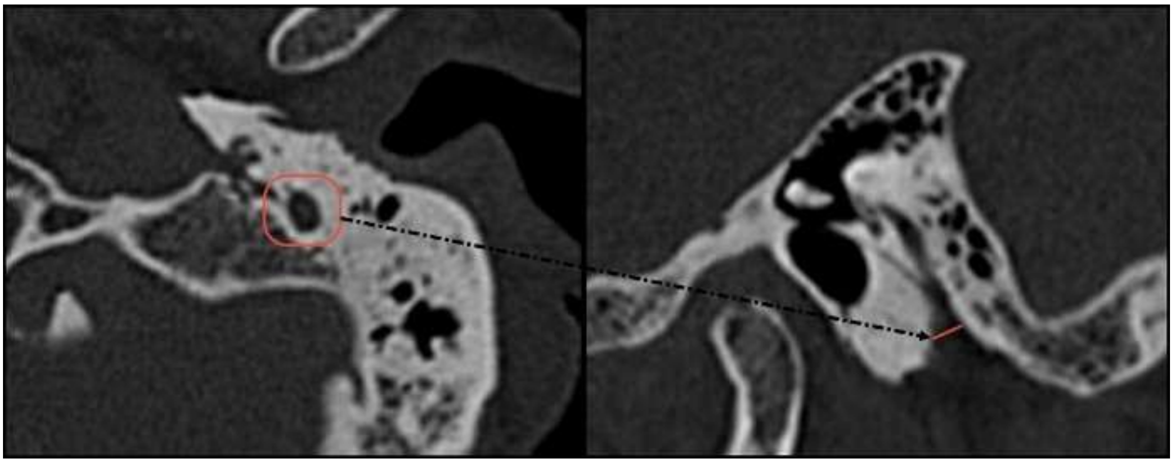

Figure 3. Detection of stylomastoid foramen

Lauren J. McManus et al. also made a similar definition (1). Secondly, it may be that the development of the mastoid part differs according to races (11). Because in studies, the extratemporal branching rate of chorda tympani was found to be 15% in New Zealand (1), 2-5% in Europe (12.14), and 53% in China (11). In our study, this rate was found to be 2.45% (Figure 4). This may show us that the development of the mastoid bone may be different depending on race. Lauren J. McManus et al. in their study, they found that the branch point of the chorda tympani was closer to the stylomastoid foramen on the right (1). In our measurements, there was no significant difference between the two sides. Studies have shown that the distance between the stylomamastoid foramen and the branching point of the chorda tympani differs racially (11). However, to the best of our knowledge, our publication is the first to show in the literature that the distance between the chorda tympani branch point and the stylomastoid foramen differs depending on gender. In our study, this distance was found to be 3.38±1.63 mm in females and 4.18±1.66 mm in males. The distance of the branching point of the chorda tympani to the stylomastoid foramen is significantly greater in males than in females. In other words, the chorda tympani branches higher in males.

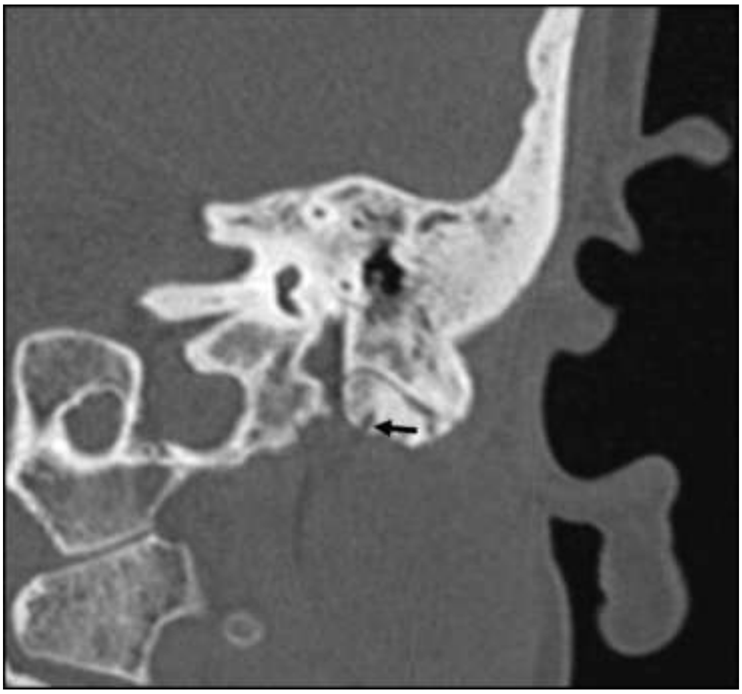

Figure 4. Extratemporal branching of the chorda tympani

We found the angle between the branching point of the chorda tympani and the facial nerve as 28.2 º ±10.7. In a cadaver study conducted in Turkey in 2010, it was found to be 23.5 º ±6.8 (15). In another study, it was measured as 18.4 º ±1.05 (6). Eun-Ju Jeon et al. they stated that the reason for the difference in measurements may be because they used different anatomical points in the measurements (6). In angle measurements, we measured the angle between the lateral border of the facial nerve and the medial border of the chorda tympani (Figure 5).

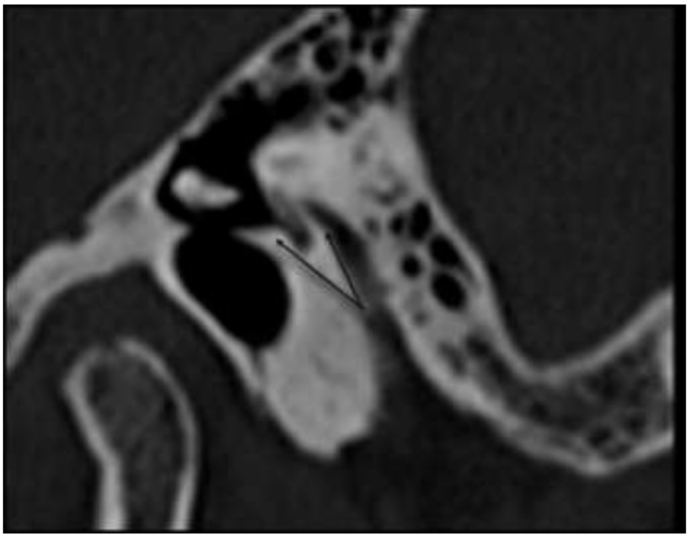

Figure 5. Measurement of the branching angle of the chorda tympani.

Another point that caught our attention in our measurements was that there was the same directional correlation between the branching angle of the chorda tympani and the distance from the branching point to the stylomastoid foramen. In other words, the closer the chorda tympani branches to the stylomastoid foramen, the narrower the angle. Line Wang et al. suggested in their study that the facial recess may narrow as this angle decreases (8), but in our study, there was no statistically significant linear relationship between the distance between the facial nerve and the chorda tympani and the branching angle of the chorda tympani.

It has been observed that the chorda tympani branches from different locations in the axial plane (Figure 6). Despite this difference, chorda tympani shows an anterolateral course in all bones. In a previous study, 54 temporal bones were examined and it was observed that the chorda tympani had an anterolateral origin in all of them (4). In another study, it was classified into two groups as lateral and posterolateral exit (16). When we examined by gender, we found that there was no significant difference in chorda tympani branching locations depending on gender.

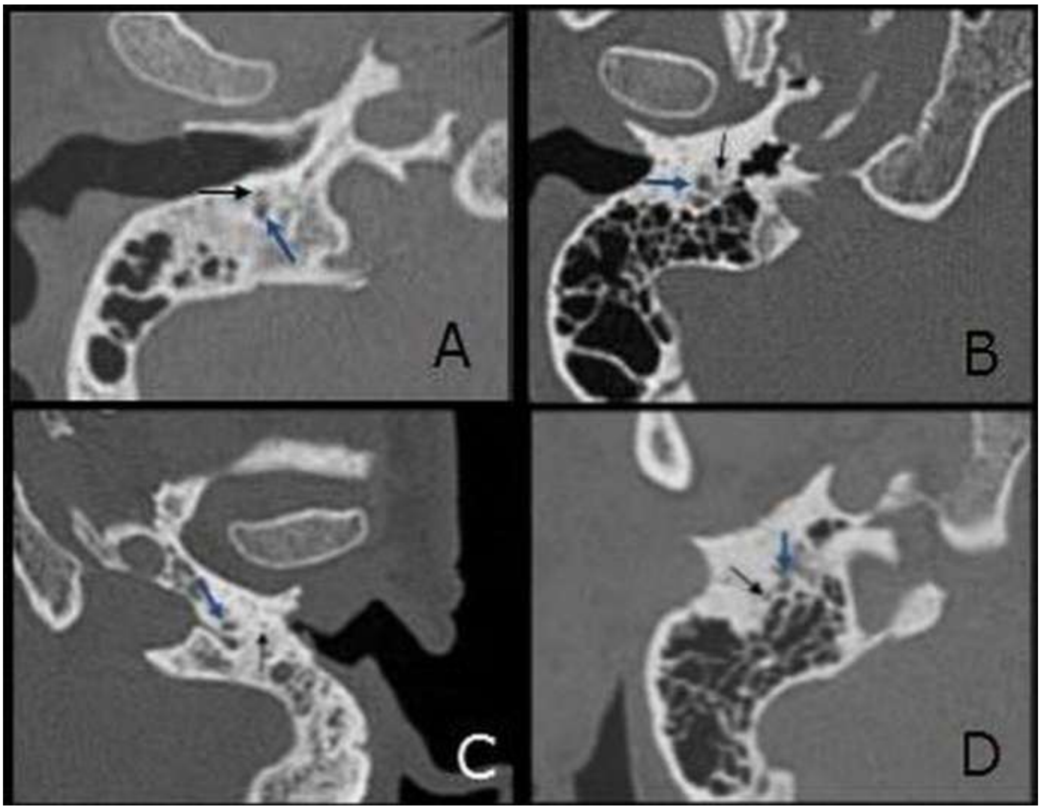

Figure 6. Branching locations of the chorda tympani in axial sections. A) Anterior B) Anterolateral C) Lateral D) Posterolateral. Black arrow indicates chorda tympani, blue arrow indicates facial nerve.

In both temporal bones, the branching angle of the chorda tympani, the distance to the stylomastoid foramen and the distance between it and the facial nerve were compared; It was observed that there was a significant difference in the distance from the stylomastoid foramen. In other words, we can say that the chorda tympani which branches from the anterior, originates more distantly from the stylomastoid foramen.

This study has several limitations. First, the number of patients included in the study is small. The 16-slice CT we used in our study is a relatively old technology.

CONCLUSION

Our study shows that the branching of the chorda tympani from the facial nerve, its distance from the stylomastoid foramen, and the distance between it and the facial nerve vary in each patient. These differences may be due to differences in the aeration of mastoid cells. Finding the chorda tympani from a single image is difficult due to the complex anatomy of the mastoid bone. Taking a specific reference point, seeing the branching of the chorda tympani from the facial nerve, and following the chorda tympani makes it easier to detect and measure the nerve. Prospective studies with Ear Nose Throat surgeons will show in more detail the effectiveness of preoperative evaluation of chorda tympani with CT in reducing intraoperative chorda tympani damage.

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RESEARCH ARTICLE

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The abstract titled "Tıp Fakültelerindeki Klinik Kayıt Tutma Derslerinin Analizi: Ders Dağılımları ve Eğitim Süreçleri" has been accepted as an oral presentation at the 14. National Medical Education Congress (UTEK 24), which will take place from October 31 to November 3 at Bursa

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Analysis of Clinical Record-Keeping Education in Turkish Medical Faculties: Evaluation of Curriculum Programs

ABSTRACT

Objective: Aimed to review the clinical record-keeping (CRK) courses offered in Turkish medical faculties and to determine their distribution according to topics. Additionally, considering the importance of early clinical experience in developing record-keeping skills, it aimed to assess the emphasis on practical and theoretical courses in the preclinical period.

Method: The pre-graduation education programs of medical faculties in Turkey with students in the 2023-2024 academic year were accessed through faculty websites. 122 out of 148 medical faculties were included in the study. All courses related to CRK were recorded in terms of their hours, the class in which they were offered, and whether they were practical or theoretical. Recorded course names were grouped under headings.

Results: Education programs of 86 (70.5%) of faculties were obtained. Of the total 1351 course hours related to CRK, 31.8% (429 hours) were theoretical, 9.6% (129 hours) were practical in the preclinical period; 58.7% (793 hours) were taught theoretically in the clinical period. The majority of theoretical courses (70.8%) were related to taking anamnesis, followed by legal document preparation (8.9%) and prescription writing (7.6%). Practical courses: 7.4% (100 hours) were on taking anamnesis. Courses on writing epicrises and electronic health records were quite limited.

Conclusions: Majority of CRK courses were offered in the clinical period and were theoretical. The limited number of practical courses may restrict students' opportunities to develop this skill. Increasing practical applications, especially in the preclinical period, can help students acquire CRK skills early and become more competent physicians after graduation. Therefore, it is recommended to increase the number and quality of CRK courses.

Keywords: Clinical Record Keeping, Medical Education, Training Program, Preclinical Education, Medical Schools.

Türkiye'deki Tıp Fakültelerinde Klinik Kayıt Tutma Eğitiminin Analizi: Ders Programlarının Değerlendirilmesi

ÖZET

Amaç: Türkiye'deki tıp fakültelerinde verilen klinik kayıt tutma (KK) derslerinin taranması ve derslerin konulara göre dağılımlarının belirlenmesi amaçlanmıştır. Ayrıca, kayıt tutma becerilerinin geliştirilmesinde erken klinik deneyimin önemini göz önünde bulundurarak, klinik öncesi dönemdeki pratik ve teorik derslerin ağırlığının belirlenmesi hedeflenmiştir.

Yöntem: 2023-2024 eğitim-öğretim yılında Türkiye'deki tıp fakültelerinin mezuniyet öncesi eğitim programlarına fakültelerin internet siteleri üzerinden ulaşıldı. 148 tıp fakültesinden 122'si çalışmaya dahil edildi. KK ile ilgili tüm derslerin saati, verildiği sınıf ve pratik veya teorik olup olmadığı kaydedildi. Kaydedilen ders isimleri daha sonra ortak başlıklar altında toplandı.

Bulgular: Çalışmaya dahil edilen 122 fakülteden 86'sının (%70,5) eğitim programlarına ulaşıldı. Toplam 1351 ders saatinin %31,8'i (429 saat) klinik öncesi dönemde teorik, %9,6'sı (129 saat) pratik; %58,7'si (793 saat) ise klinik dönemde teorik olarak veriliyordu. Teorik derslerin büyük çoğunluğu (%70,8) anamnez alma ile ilgiliydi, bunu adli belge hazırlama (%8,9) ve reçete yazma (%7,6) takip etti. Pratik derslerin ise %7,4'ü (100 saat) anamnez alma üzerineydi. Epikriz yazma ve elektronik sağlık kayıtları ile ilgili dersler oldukça sınırlıydı.

Sonuç: KK tutma derslerinin büyük çoğunluğunun klinik dönemde ve teorik olarak verildiği belirlenmiştir. Pratik derslerin sınırlı olması, öğrencilerin bu beceriyi geliştirme fırsatını kısıtlayabilir. Özellikle klinik öncesi dönemde pratik uygulamaların artırılması, öğrencilerin KK tutma becerilerini erken dönemde kazanmalarına ve mezuniyet sonrasında daha yetkin hekim olmalarına katkı sağlayabilir. Bu nedenle, tıp fakültelerinde KK tutma derslerinin sayısının ve niteliğinin artırılması önerilmektedir.

Anahtar Kelimeler: Klinik Kayıt Tutma, Tıp Eğitimi, Eğitim Programı, Klinik Öncesi Eğitim, Tıp Fakülteleri.

INTRODUCTION

Clinical records (CRs) are fundamental tools in healthcare, encompassing patients' symptoms, medical history, laboratory and imaging results, and treatment notes. Whether electronic or paper-based, clinical records are crucial for ensuring continuity of care and enhancing communication among multidisciplinary healthcare teams, including doctors, nurses, and other healthcare professionals (1-3). As the foundation of communication, clinical records also reflect the quality of patient care (2). Incomplete, inappropriate, or illegible records can lead to unnecessary delays, unnecessary procedures for patients, and medical errors (2, 4). In addition to their importance in communication, CRs serve as legal documents and evidence in financial audits of healthcare services, forensic investigations, patient complaints, and compensation lawsuits (1, 3). Due to all these characteristics, CR training is included in medical school curricula, and every graduating physician must understand the importance of CRs and be able to maintain them properly.

There is data in the literature showing that a significant portion of healthcare workers' time is spent on maintaining clinical records (5). Studies have demonstrated that a substantial part of the workload for interns and resident physicians involves writing discharge summaries and preparing other documents related to clinical records (6, 7). In addition, it has been reported that there are deficiencies in the training provided in our country regarding CR maintenance (8). These findings highlight the critical role that CRs play in clinical operations. In today’s increasingly digital world, electronic health records (EHRs) have begun to be maintained. This has relatively reduced the workload for physicians and healthcare workers (9). However, the necessity has also emerged to provide pre-graduation training to physicians on the use and operation of EHRs.

In medical education, teaching students the skills related to maintaining CRs prepares them for their professional careers after graduation. This training enables students to acquire the ability to document clinical encounters accurately and effectively, allowing them to provide high-quality care in their medical practice. Additionally, it is evident that training on EHRs is also a necessity in modern medical education.

This study aims to review the clinical record-keeping courses offered in medical schools and to determine the distribution of these courses according to topics. Secondly, considering the importance of early clinical experience in developing record-keeping skills, the study seeks to assess the balance of practical and theoretical courses during the preclinical period.

MATERIAL AND METHODS

This study did not involve human participants, interventions, or identifiable personal data. The data were obtained from publicly available sources (medical faculty websites). Therefore, ethical approval was not required, in accordance with national research guidelines.

The pre-graduation education programs of medical schools in Turkey, with active students during the 2023-2024 academic year, were accessed via the medical schools' websites. According to the Higher Education Institution’s website (10), there were a total of 148 medical faculties during this academic year, 98 of which were state universities and 50 were foundation universities. Among these, 36 faculties provided education in English, while 112 offered education in Turkish. Twenty-six of these faculties offered both Turkish and English programs within the same medical school. Therefore, it was assumed that the curricula were the same, with only language differences, and one medical school from each of these universities was included in the study. Consequently, 122 faculties were included in the study, and it was aimed to access the educational programs of all of them.

In the accessible medical school curricula, all courses related to clinical records (such as medical records, electronic medical records, electronic record systems, taking medical history, writing discharge summaries, writing consultation notes, writing forensic reports, etc.) were recorded, including the class in which they were offered and whether they were practical or theoretical in the clinical period. When examining the clinical period curricula, some were excluded from the study due to various limitations, such as the inability to detail practical course hours in the curricula, the difficulty in determining the number of practical hours for students divided into groups, and the designation of certain independent learning hours as activities like taking patient histories, making standardization challenging. The recorded course names were later grouped under common headings (taking medical history, forensic documents, prescriptions, writing discharge summaries, general knowledge of medical records). The evaluation and classification of the courses in the curricula were carried out by a resident physician and a faculty member with a doctorate in medical education.

RESULTS

Out of the total 122 universities, access was gained to the educational programs of 86 faculties (70.49%), including 72 state and 14 foundation universities. The educational programs for the 2024-2025 academic year were accessible for 31 faculties, while the programs for the 2023-2024 academic year were accessible for 55 faculties. Of the faculties with accessible programs, 72 had already graduated students. Out of the 86 medical faculties that were reached, the complete curricula of 61 faculties (70.93%) were obtained. Access was gained to the first-year curricula of one faculty (1.16%), second-year curricula of three faculties

Table 1. Theoretical Course Names and Hour Distribution

Course Names	**Course Hours (%)**
History Taking - Medical History - Patient History	**957 (70.84%)**
General History Taking	22 (1.63%)
Adult Patient	99 (7.33%)
Internal Medicine	20 (1.48%)
Hematology	18 (1.33%)
Gastroenterology	32 (2.37%)
Nephrology	19 (1.41%)
Rheumatology	12 (0.89%)
Oncology	1 (0.07%)
Pulmonary Medicine	87 (6.44%)
Cardiovascular	98 (7.25%)
Geriatrics	2 (0.15%)
Immunology	1 (0.07%)
Endocrinology	5 (0.37%)
Pediatrics	130 (9.62%)
Otolaryngology (ENT)	18 (1.33%)
Gynecology/Obstetrics	96 (7.11%)
Psychiatry	70 (5.18%)
Child Psychiatry	12 (0.89%)
Musculoskeletal System/Locomotor System	32 (2.37%)
Neurology	40 (2.96%)
Surgery	71 (5.26%)
Dermatology	10 (0.74%)
Infectious Diseases	18 (1.33%)
Emergency Medicine	4 (0.30%)
Urology	26 (1.92%)
Genetics	5 (0.37%)
Sexual History	4 (0.30%)
Ophthalmology	5 (0.37%)
Prescription	**102 (7.55%)**
Prescription Writing	101 (7.48%)
Magistral Prescription	1 (0.07%)
Forensic Documents	**120 (8.88%)**
Death Certificate Preparation	20 (1.48%)
Autopsy Report	5 (0.37%)
Forensic Report Writing	82 (6.07%)
Sexual Assault History/Report	13 (0.96%)
Informed Consent	**28 (2.07%)**
Reporting Legally Mandated Diseases	**2 (0.15%)**
Preparing Athlete’s License/Health Report	**1 (0.07%)**
Preparing Patient File	**1 (0.07%)**
Microbiology Test Request	**1 (0.07%)**
Consultation in Emergency Department	**1 (0.07%)**
Writing/Preparing Discharge Summary	**4 (0.30%)**
Discharge Summary Note	2 (0.15%)
Preparing Discharge Summary and Admission Note in Pediatrics	2 (0.15%)
General Medical Record	**5 (0.37%)**
Medical Records	2 (0.15%)
Electronic Health Record	1 (0.07%)
Hospital Information Systems and Applications	1 (0.07%)
Documentation Processes, Recording, and Reporting in Medical Practice	1 (0.07%)

(3.49%), and up to the third, fourth, and fifth-year curricula of seven faculties each (8.14%).

In total, 31.75% (429 hours) of the 1351 course hours related to record-keeping were delivered as theoretical courses during the preclinical period, while 9.55% (129 hours) were practical. During the clinical period, 58.7% (793 hours) of the courses were theoretical. When the theoretical courses were classified by topic, 70.84% (957 hours) were focused on taking medical history, 8.88% (120 hours) on preparing forensic documents, 7.55% (102 hours) on writing prescriptions, 0.37% (5 hours) on general medical record knowledge, and 0.3% (4 hours) on writing discharge summaries (Table 1). Regarding the practical courses, 7.4% (100 hours) were dedicated to taking medical history, 0.44% (6 hours) to obtaining consent, and 0.3% (4 hours) to preparing forensic documents (Table 2).

Table 2. Practical Courses and Hour Distribution

Course Names	**Course Hours (%)**
Prescription Writing	**14 (1.04%)**
History Taking - Medical History - Patient History	**100 (7.40%)**
General History Taking	45 (3.33%)
Musculoskeletal/Locomotor System	4 (0.30%)
Cardiovascular	6 (0.44%)
Gynecology/Obstetrics	3 (0.22%)
Neurological	7 (0.52%)
Simulated History Taking	13 (0.96%)
Endocrinology	1 (0.07%)
Gastroenterology	4 (0.30%)
Nephrology	3 (0.22%)
Psychiatry	4 (0.30%)
Pulmonary/Respiratory System	6 (0.44%)
Surgery	4 (0.30%)
Preparing Forensic Documents	**4 (0.30%)**
Preparing Forensic Reports	3 (0.22%)
Preparing Death Certificates	1 (0.07%)
Informed Consent	**6 (0.44%)**
Laboratory Request Forms	**1 (0.07%)**
Discharge Summary	**2 (0.15%)**
Refusal of Treatment Form	**1 (0.07%)**

DISCUSSION

In this study, the majority of the CR courses (58.7%) were found to be concentrated in the clinical period. Given that practical courses during the clinical period were not included in the study, this represents a significant proportion. A review article in the literature also evaluated studies on educational interventions related to CR training. It was noted that most of these studies were planned as single-group pretest-posttest designs during the clinical period (11). It is well known that early exposure to clinical skills is important for acquiring and maintaining the necessary skills (12). Therefore, increasing the number of course hours in the preclinical period is essential for developing clinical record-keeping skills.

When examining the topics of CR courses in this study, it was found that the majority of theoretical courses focused on taking medical history, followed by writing prescriptions and preparing forensic documents. Similarly, the highest number of practical course hours was dedicated to taking medical history. However, there were significantly fewer course hours devoted to topics such as writing discharge summaries and requesting consultations. Additionally, general CR knowledge and EHR-related courses were limited to just five hours in total. In a study conducted in Turkey, students reported that they generally learned about CR and how to request consultations from resident physicians (8). The same study indicated that faculty members attributed the incomplete and poor-quality CR to a lack of proper education (8). Considering that CR education is lacking in the curricula, it is clear that the course content, particularly concerning topics other than taking medical history, needs to be revisited.

Regarding the departments offering these courses, most were taught by internal medicine departments, with pediatrics and internal medicine being the most prominent. Surgical departments, on the other hand, lagged behind in this area. Given that medicolegal issues are more common in surgical departments, maintaining high-quality CR is even more crucial in these fields. Studies in surgical departments have also highlighted the inadequacy of CR-related documentation (13). Therefore, it is essential to consider this issue when planning course curricula.

Due to educational deficiencies, it has been observed that medical students often disregard the curriculum and turn to alternative sources (14). Videos and online educational materials accessible through the internet are frequently used for this purpose. However, attention must be paid to the quality and comprehensiveness of these resources. A study by Emekli and Kıyak (2024) evaluated the comprehensiveness and educational quality of videos available on YouTube for clinical record-keeping training. The results of the study indicated that a significant portion of the videos failed to cover the essential components of clinical record-keeping and that their educational quality was below expected standards. It was also noted that these deficiencies persisted even in videos uploaded by universities and professional organizations (15). Therefore, it has become imperative for medical educators to encourage the use of reliable learning resources.

For all these reasons, the only viable solution to improving the quality of CR is to enhance the formal curriculum with better teaching methods, strategies, and increased practical training. Similar justifications have led to numerous studies in the literature. Many of these studies have reported positive outcomes following educational interventions (16-19). These studies have shown improvements in various parameters, such as the quality and accuracy of clinical records and the timeliness of record completion, each assessed using different criteria. However, in a few studies, it was noted that the implemented educational programs or interventions did not have any positive effects (20, 21).

This study has some limitations. Firstly, the educational programs of all medical schools in Turkey could not be accessed; only the programs of 86 out of 122 faculties included in the study were available. This limitation may prevent the data obtained from representing all medical faculties. Additionally, due to the lack of detailed and standardized documentation of practical course hours during the clinical period, these courses were not included in the study. This restricted the analysis of practical training, which is crucial for developing clinical record-keeping skills. Lastly, the study only examined course names and hours listed in the curricula and did not evaluate the effectiveness of the course content or the applied teaching methods. Therefore, the results are limited to providing a quantitative analysis of clinical record-keeping education in medical faculties.

This study analyzed CR courses by reaching a significant portion of medical schools in Turkey. It was found that most CR-related courses were offered during the clinical period. However, there were notable differences between faculties, particularly with the low proportion of practical courses. CR skills are critically important for preventing errors in medical practice, ensuring patient safety, and facilitating accurate communication after graduation. Yet, the study found that these courses were less prevalent in the preclinical period and were primarily theoretical. The limited availability of practical courses may restrict students' opportunities to develop these essential skills. In the clinical period, the lack of detail and standardization in practical course hours further complicates the measurement of effectiveness. In conclusion, there is a need to increase the number and quality of CR courses in medical schools. Expanding practical training in the preclinical period could help students acquire these skills earlier, contributing to their competence as physicians after graduation.

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RESEARCH ARTICLE

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Biological Rhythms, Sleep Disturbances, and Women's Mental Health: Findings from a Psychiatric Inpatient Unit

ABSTRACT

Objective: Sleep and circadian rhythm disruptions are common in neuropsychiatric disorders, correlating with symptom severity, relapse rates, and poor treatment response. Women experience higher rates of sleep disturbances than men due to biological, social, and psychological factors. However, data on sleep issues in hospitalized female psychiatric patients remain limited. This study assessed sleep patterns in female psychiatric inpatients at admission and discharge and identified factors influencing changes in sleep quality.

Method: Ninety female psychiatric inpatients were evaluated using the Pittsburgh Sleep Quality Index, Epworth Sleepiness Scale, Insomnia Severity Index and Biological Rhythm Interview of Assessment in Neuropsychiatry at both admission and discharge. Sociodemographic data, psychiatric diagnoses, and treatment details were collected through structured interviews. Data were analyzed using SPSS 22.0.

Results: At admission, 87.8% of patients reported poor sleep quality, which decreased to 63.3% at discharge. Despite improvement, significant sleep disturbances persisted. Poor sleep quality at discharge was associated with higher benzodiazepine use, unemployment, family history of sleep disorders, and frequent hospitalizations. No significant differences were found across psychiatric diagnoses. Age correlated positively with sleep medication use. Disruptions in circadian rhythms were strongly linked to poorer sleep quality and higher insomnia severity.

Conclusions: Sleep disturbances persist in female psychiatric inpatients despite treatment and are influenced by sociodemographic, clinical, and circadian rhythm factors. Targeted, gender-specific interventions addressing biological, psychological, and social contributors, including circadian irregularities, may improve treatment outcomes, reduce hospitalizations, and enhance patient care in psychiatric settings.

Keywords: Sleep, Circadian Rhythm, Women, Hospitalization.

Biyolojik Ritimler, Uyku Bozuklukları ve Kadın Ruh Sağlığı: Bir Psikiyatri Yatan Hasta Ünitesinden Bulgular

ÖZET

Amaç: Uyku ve sirkadiyen ritim bozuklukları, nöropsikiyatrik hastalıklarda yaygın olarak görülmekte ve semptom şiddeti, nüks oranları ve tedaviye yanıtsızlık ile ilişkilendirilmektedir. Kadınlar, biyolojik, sosyal ve psikolojik faktörler nedeniyle erkeklere kıyasla daha yüksek oranda uyku bozuklukları yaşamaktadır. Ancak, hastaneye yatırılan kadın psikiyatri hastalarında uyku sorunlarına ilişkin veriler sınırlıdır. Bu çalışma, kadın psikiyatri hastalarının yatış ve taburculuk sırasındaki uyku örüntülerini değerlendirmeyi ve uyku kalitesindeki değişimleri etkileyen faktörleri belirlemeyi amaçlamıştır.

Yöntem: Doksan kadın psikiyatri hastası, yatış ve taburculuk dönemlerinde Pittsburgh Uyku Kalitesi İndeksi, Epworth Uykululuk Ölçeği, İnsomni Şiddeti İndeksi ve Nöropsikiyatride Biyolojik Ritim Değerlendirme Görüşmesi kullanılarak değerlendirilmiştir. Sosyodemografik veriler, psikiyatrik tanılar ve tedavi detayları yapılandırılmış görüşmeler yoluyla toplanmıştır. Veriler SPSS 22.0 kullanılarak analiz edilmiştir.

Bulgular: Yatış sırasında hastaların %87,8'i kötü uyku kalitesi bildirmiştir, bu oran taburculukta %63,3'e düşmüştür. İyileşmeye rağmen, önemli ölçüde uyku bozuklukları devam etmiştir. Taburculukta kötü uyku kalitesi, yüksek benzodiazepin kullanımı, işsizlik, ailede uyku bozukluğu öyküsü ve sık hastaneye yatış ile ilişkilendirilmiştir. Psikiyatrik tanılar arasında anlamlı bir fark bulunmamıştır. Yaş, uyku ilacı kullanımı ile pozitif korelasyon göstermiştir. Sirkadiyen ritim bozuklukları, kötü uyku kalitesi ve artmış insomni şiddeti ile güçlü bir şekilde ilişkilendirilmiştir.

Sonuç: Kadın psikiyatri hastalarında uyku bozuklukları tedaviye rağmen devam etmekte ve sosyodemografik, klinik ve sirkadiyen ritim faktörlerinden etkilenmektedir. Biyolojik, psikolojik ve sosyal katkıları hedefleyen, cinsiyete özgü müdahaleler, tedavi sonuçlarını iyileştirebilir, hastaneye yatışları azaltabilir ve psikiyatri servislerindeki hasta bakımını güçlendirebilir.

Anahtar Kelimeler: Uyku, Sirkadiyen Ritim, Kadın, Hastaneye Yatış.

INTRODUCTION

Sleep is a fundamental aspect of life and prone to distrubution due to various reasons. Sleep disturbances can contribute to the development of various psychiatric disorders (1). Notably, sleep disturbances are frequently included in the diagnostic criteria for many mental health conditions, highlighting their critical role in overall well-being (2).

Among these disruptions, women are particularly affected, experiencing sleep disorders twice as often as men (3). This makes female gender a significant risk factor for sleep-related issues. Interestingly, while women report more frequent and severe subjective sleep complaints, they appear to show greater resilience to sleep-disrupting cytokines and achieve better outcomes in objective sleep measurements (4). This paradox is closely tied to higher levels of psychological distress in women, emphasizing the need to consider gender-specific factors in addressing sleep disturbances (4, 5).

As a core biological rhythm regulated by circadian cycles, sleep reflects the body's intrinsic 24-hour timing system. Women tend to favor the morning chronotype more than men, though this preference diminishes with age (6). However, the evening chronotype, which is more strongly associated with depression, anxiety, poor sleep quality, and a higher correlation between daytime sleepiness and anxiety symptoms, presents unique challenges for women (7).

Previous research highlights that sleep disorders in psychiatric patients are closely associated with reduced quality of life, greater symptom severity, frequent relapses, and diminished treatment response (8). Sleep problems are particularly common among psychiatric inpatients, with hospitalization often signaling a crisis point in their mental health journey (9). Poor sleep not only affects individual patients but also disrupts the functioning of psychiatric units, challenges medical staff, and strains institutional resources. Severe sleep disturbances in psychiatric inpatients can lead to an increased risk of self-harm, aggressive behavior, and attempts to leave the hospital without permission (10). Despite efforts to reduce the duration and frequency of hospitalizations, approximately 40% of patients are re-admitted within a year, further complicating their recovery process (11).

The significant comorbidity between sleep and psychiatric disorders, coupled with the high rates of readmission, underscores the critical need to evaluate and address sleep issues within this population (8). However, studies focusing specifically on sleep disturbances in psychiatric inpatient settings remain limited, especially those examining female patients, who represent a uniquely vulnerable group in this context (8, 12).

This study seeks to fill this gap by investigating the sleep characteristics and diagnoses of female psychiatric inpatients—both at admission and discharge—focusing on changes in their sleep patterns and identifying the factors influencing these changes. By targeting women at one of the most critical and vulnerable points in their mental health journey, the study aims to shed light on the intricate interplay between biological rhythms, sleep disturbances, and women’s mental health, providing a deeper understanding of their impact during psychiatric crises.

MATERIAL AND METHODS

Sample: This cross-sectional study was conducted in the Psychiatry Inpatient Clinic of Recep Tayyip Erdoğan University Faculty of Medicine between 01.02.2020 and 01.01.2022, with a total of 90 female participants. Exclusion criteria were as follows: being under 18 years of age, presence of behavioral disorders impairing the ability to comprehend tests, mental retardation, dementia, or other cognitive impairments, and hospitalization lasting less than one week.

Data Collection Tools: A detailed sociodemographic form prepared by the researchers included demographic variables such as age, education level, marital status, employment status, presence of medical illness, family history of sleep disorders and psychiatric illnesses, diagnosis of psychiatric disorders followed in the clinic, duration of illness, previous hospitalizations, length of stay, use of psychotropic drugs before admission, and clinical follow-up.

The Pittsburgh Sleep Quality Index (PSQI) was developed by Buysse et al. (13) to assess subjective sleep quality, sleep duration, habitual sleep efficiency, presence of sleep disorders, frequency of sleep medication use, and severity of daytime dysfunction in the past month. Participants can score between 0-21, with a score greater than 5 indicating poor sleep quality, while a score of 5 or less indicates good sleep quality. The Turkish validity and reliability studies were conducted by Ağargün et al.(14).

The Epworth Sleepiness Scale (ESS) is a self-report scale designed to determine daytime sleepiness and excessive sleep tendency (15). It consists of 8 sections with a Likert scale scoring between 0 and 3. A total score of 10 or more indicates excessive daytime sleepiness. The validity and reliability studies were conducted by Ağargün et al. (16).

The Insomnia Severity Index (ISI) is a self-report scale that screens for the severity of insomnia symptoms (17). It offers a Likert-type measurement. The scores of the seven items are summed for evaluation. The total score ranges between 0-28, and a score of 10 or more suggests clinical insomnia, while a score of 15 or more indicates a diagnosis of insomnia. The Turkish adaptation was conducted by Boysan et al. (18), and the Turkish version of the scale was identified to be valid and reliable.

The Biological Rhythm Interview of Assessment in Neuropsychiatry (BRIAN) was developed by Giglio et al. (19) to measure individuals' daily circadian rhythms and functionality. The scale consists of 21 items in a four-point Likert format, with higher scores indicating irregularities in biological rhythms. It includes five subscales: sleep, activities, social aspects, eating habits, and dominant rhythm pattern. When calculating the total score of the scale, the dominant rhythm pattern scores are not included. The Turkish adaptation was carried out by Aydemir et al. (20).

Procedure: The initial interviews with the patients included in the study were conducted approximately 72-96 hours after admission, lasting about 30-45 minutes, by the researcher. A final interview was conducted with the patients who continued in the study before discharge.

During the first interview, the participants were administered a semi-structured data collection form, Pittsburgh Sleep Quality Index (PSQI), Epworth Sleepiness Scale (ESS), Biological Rhythm Interview of Assessment in Neuropsychiatry (BRIAN) and Insomnia Severity Index (ISI). The PSQI, ESS, and ISI were re-administered during the final interview before discharge. The diagnoses of the patients, indications for admission, psychiatric history, and any additional diagnoses at discharge were evaluated according to the DSM-5 diagnostic system. The analyzed patients were grouped based on their primary psychiatric diagnoses.

This research was approved by the Ethics Committee of Recep Tayyip Erdoğan University Faculty of Medicine on 24.01.2020, with decision number 2020/03. The patients were informed about the study, and their written consent was obtained.

Statistical Method: The normality of the distribution of continuous numerical variables was examined using the Kolmogorov-Smirnov test, and the homogeneity of variances assumption was checked with the Levene test. Descriptive statistics are presented as mean ± standard deviation, median [minimum-maximum], or median (25th-75th percentile) for continuous numerical variables, and as case numbers and (%) for categorical variables.

The Wilcoxon Signed Rank test was used to examine whether there was a statistically significant change in clinical scale scores and sleep-related subscale and total scale scores after treatment compared to before treatment. The McNemar test was used to evaluate whether the improvement in the total sleep quality index in Pittsburgh and the improvement in the frequency of insomnia in terms of total insomnia were statistically significant.

The significance of the difference between groups in terms of continuous numerical variables where parametric test statistics assumptions were met was examined with the Student's t-test. The significance of the difference between groups in terms of continuous numerical variables where parametric test statistics assumptions were not met was examined with the Mann-Whitney U test when there were two independent groups, and the Kruskal-Wallis test when there were more than two independent groups.

In 2x2 contingency tables, categorical data were evaluated with Fisher's exact test when the expected frequency was less than 5 in at least ¼ of the cells, and with the continuity-corrected $\chi 2$ test when the expected frequency was between 5-25. In RxC (row or column categorical variables with more than two outcomes) contingency tables, categorical data were examined with the Fisher Freeman Halton test when the expected frequency was less than 5 in at least ¼ of the cells. Data analysis was performed using the SPSS 22.0 (IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.) statistical software package. Results with p<0.05 were considered statistically significant.

RESULTS

1. Sample Characteristics and Clinical Diagnoses: This study initially considered 120 female participants. After applying exclusion criteria, the final sample consisted of 90 women admitted to the Psychiatry Inpatient Clinic of Recep Tayyip Erdoğan University Faculty of Medicine. The participants' mean age was 40.7 years (SD = 12.7), ranging from 18 to 74. Among them, 64.4% (n = 58) reported a family history of mental illness, and 50% (n = 50) reported a family history of sleep disorders.

Diagnostic distribution revealed that 37.8% (n = 34) had schizophrenia or other psychotic disorders, 35.6% (n = 32) had bipolar and related disorders, 6.7% (n = 6) had schizoaffective disorder, 33.3% (n = 30) had depressive disorders, 25.6% (n = 23) had anxiety disorders, and 47.8% (n = 43) had other psychiatric conditions. Due to the comorbidity between anxiety and depressive disorders (present in 70.9% of the relevant subgroup), the total number of diagnoses exceeded the number of participants, as multiple diagnoses per individual were recorded (Table 1).

In terms of pharmacological treatment, the usage of antidepressants, antipsychotics, and mood stabilizers (MS) significantly increased by the time of discharge compared to pre-admission usage (p < .001). Antidepressant use rose from 34.4% to 51.1%, antipsychotic use from 45.6% to 86.7%, and MS use from 15.6% to 36.7%. However, no significant difference was observed in benzodiazepine (BDZ) use between the admission and discharge periods (p > .05).

Table 1. Demographic and Clinical Characteristics of Cases

Variable	**Mean ± SD**	**Median (Min-Max)**
Age (years)	40.7 ± 12.7	
Previous Disease Duration (years)		8 [1-40]
Number of Admissions		1 [0-20]
Duration of Inpatient Stay (days)		20 [9-63]
	n	**%**
Marital Status		
Single/Divorced/Widowed	42	46.7
Married	48	53.3
Education Level		
Literate	10	11.1
Primary School	45	50.0
High School	20	22.2
University	15	16.7
Employed in Any Job		
Yes	16	17.8
History of Medical Illness		
Yes	45	50.0
Family History of Mental Illness		
Yes	58	64.4
Family History of Sleep Disorder		
Yes	45	50.0
Psychiatric Diagnoses		
Schizophrenia and Other Psychotic Disorders	34	37.8
Bipolar Disorder	32	35.6
Schizoaffective Disorder	6	6.7
Depressive Disorders	30	33.3
Anxiety Disorders	23	25.6
Other Disorders	43	47.8
History of Previous Admissions		
Yes	49	54.4

2. Sleep Profiles and Their Correlates Before, During, and After Psychiatric Admission: Participants were classified into two groups based on a PSQI total score cutoff of 5 to distinguish between poor and good sleep quality prior to admission. While most sociodemographic and clinical features did not differ significantly between these groups, those with poor sleep quality had a significantly lower employment rate ($p < .05$), a higher median number of previous psychiatric admissions ($p < .05$), and increased BDZ usage during hospitalization ($p < .05$) (Table 2).

From admission to discharge, significant improvements were observed in both sleep quality and insomnia severity. PSQI total and subscale scores (excluding the sleep medication component), as well as ISI total scores, significantly decreased after hospitalization ($p < .001$). The proportion of patients classified as having poor sleep quality dropped from 87.8% to 63.3% following treatment ($p < .001$), and the proportion with clinically significant insomnia decreased from 73.3% to 23.3% ($p < .001$) (Table 3).

Analysis of circadian rhythm disturbances revealed meaningful associations between BRIAN subscale scores and various sleep-related measures. The BRIAN sleep, activity, and social subscale scores were all positively correlated with PSQI total scores and ISI scores ($p < .05$). The BRIAN sleep subscale also correlated with the Epworth Sleepiness Scale (ESS) ($p < .05$). Weak but significant correlations were observed between the BRIAN eating subscale and PSQI and ISI scores ($p < .05$). The total BRIAN score demonstrated a moderate correlation with PSQI total scores ($r = .558$, $p < .05$), in addition to significant correlations with both ESS and ISI scores (Table 4).

Regarding individual characteristics, no significant correlations were found between age and PSQI subscales (excluding sleep medication), PSQI total scores, or ISI scores at admission ($p > .05$). However, age was positively correlated with the PSQI sleep medication subscale ($r = .272$, $p < .05$). Similarly, length of hospital stay was not significantly associated with any sleep-related measures (Table 5).

Finally, participants with a family history of sleep disorders had significantly higher pre-admission PSQI scores in the domains of sleep duration, sleep disturbances, daytime dysfunction, and overall sleep quality ($p < .01$). Their ISI total scores were also significantly higher compared to those without such a history ($p < .05$). No significant differences were observed in other PSQI subscales (Table 6).

Table 2. Demographic and Clinical Characteristics of Cases Based on Sleep Disorder Presence at Admission

	Good Sleep Quality (n=11)		**Poor Sleep Quality (n=79)**		
	Mean ± SD		**Mean ± SD**		**p-value†**
Age (years)	35.6 ± 12.4		41.4 ± 12.7		0.160
Previous Disease Duration (years)	7.45 ± 9.56		11.7 ± 10.2		0.101§
Number of Admissions	0.545 ± 1.21		2.03 ± 3.68		**0.048§**
Duration of Inpatient Stay (days)	20.5 ± 7.17		22.5 ± 11.3		0.839§
	n	**%**	**n**	**%**	**p-value†**
Marital Status					
Single/Divorced/Widowed	4	36.4	38	48.1	0.683‡
Married	7	63.6	41	51.9	
Education Level					
Literate	0	0.0	10	12.7	
Primary School	5	45.5	40	50.6	
High School	3	27.3	17	21.5	
University	3	27.3	12	15.2	0.529¶
Employed in Any Job					
Yes	5	45.5	11	13.9	**0.023¥**
Family History of Mental Illness					
Yes	7	63.6	51	64.6	>0.999¥
Family History of Sleep Disorder					
Yes	3	27.3	42	53.2	0.198‡
Psychiatric Diagnoses					
Schizophrenia and Other Psychotic Disorders	4	36.4	30	38.0	>0.999¥
Bipolar Disorder	5	45.5	27	34.2	0.512¥
Schizoaffective Disorder	1	9.1	5	6.3	0.554¥
Depressive Disorders	3	27.3	27	34.2	0.746¥
Anxiety Disorders	2	18.2	21	26.6	0.722¥
Other Disorders	2	18.2	41	51.9	0.076‡
History of Previous Admissions	3	27.3	46	58.2	0.108‡
Use of Medication Before Admission	4	36.4	49	62.0	0.189¥
Use of BDZ at Admission	7	63.6	72	91.1	**0.026¥**

† Student's t-test, ‡ Continuity-corrected $\chi 2$ test, ¶ Fisher Freeman Halton test, ¥ Fisher's exact probability test, § Mann Whitney U test, BDZ: benzodiazepines and their derivatives.

Table 3. Pre- and Post-Test Scores of Sleep-Related Subscales and Total Scale Scores of Cases

	Pre-Test	Post-Test		
	Median (Min-Max)	**Median (Min-Max)**	**p-value†**	**Change**
ESS	40 (10-80)	30 (00-60)	0.009	-10 (-40 - 20)
PSQI				
Subjective Sleep Quality	20 (10-20)	10 (00-10)	<0.001	-10 (-10 - 00)
Sleep Latency	20 (10-30)	10 (00-10)	<0.001	-10 (-20 - 00)
Sleep Duration	10 (00-30)	00 (00-10)	<0.001	-10 (-20 - 00)
Sleep Efficiency	10 (00-30)	00 (00-03)	<0.001	-10 (-20 - 00)
Sleep Disturbance	20 (10-20)	10 (10-10)	<0.001	-10 (-10 - 00)
Use of Sleep Medication	00 (00-30)	20 (10-30)	<0.001	10 (00 - 20)
Daytime Dysfunction	15 (10-20)	10 (00-10)	<0.001	-10 (-10 - 00)
Total PSQI Score	110 (70-140)	55 (40-80)	<0.001	-40 (-63 - -20)
ISI	120 (70-150)	50 (18-70)	<0.001	-60 (-100 - -40)
	(n, %)	**(n, %)**	**p-value†**	**Change**
PSQI Poor Sleep Quality	79 (87.8%)	57 (63.3%)	<0.001‡	22 (24.4%)
Total Insomnia	66 (73.3%)	21 (23.3%)	<0.001‡	45 (50.0%)

Descriptive statistics were presented as median (25th percentile - 75th percentile). † Wilcoxon signed-rank test, ‡ McNemar test, ¶ Number and percentage of cases showing positive change (improvement) in sleep quality, ¥ Number and percentage of cases showing positive change (improvement) in insomnia, PSQI: Pittsburgh Sleep Quality Index, ESS: Epworth Sleepiness Scale, ISI: Insomnia Severity Index.

Table 4. Correlation coefficients and significance levels between pre-treatment biological rhythm subscale and total scale scores and pre-treatment sleep-related subscale and total scale scores

	Sleep		Activity		Social		Eating		Total	
	r	p-value†	r	p-value†	r	p-value†	r	p-value†	r	p-value†
ESS	0.229	**0.030**	0.123	0.249	0.081	0.449	0.110	0.300	0.216	**0.041**
BRIAN-Dominant Chronotype	0.399	**<0.001**	-0.044	0.681	0.087	0.413	-0.024	0.823	0.111	0.296
PSQI- Total	0.466	**<0.001**	0.429	**<0.001**	0.315	**0.020**	0.287	**0.006**	0.558	**<0.001**
ISI	0.364	**<0.001**	0.223	**0.035**	0.252	**0.016**	0.223	**0.035**	0.361	**<0.001**

† Spearman's rank correlation test; PSQI: Pittsburgh Sleep Quality Index, ESS: Epworth Sleepiness Scale, ISI: Insomnia Severity Index, BRIAN: Biological Rhythm Interview of Assessment in Neuropsychiatry.

Table 5. Correlation coefficients and significance levels between participants' age, length of hospital stay, pretreatment PSQI subscale and total scores, and total insomnia severity scores

	Age		Length of hospital stay	
	r	p-value†	r	p-value†
PSQI				
PSQI - Subjective Sleep Quality	0.073	0.493	-0.011	0.916
PSQI - Sleep Latency	0.056	0.600	-0.094	0.380
PSQI - Sleep Duration	0.028	0.796	0.062	0.559
PSQI - Sleep Efficiency	0.037	0.726	-0.014	0.895
PSQI - Sleep Disturbance	-0.062	0.563	-0.038	0.721
PSQI - Use of Sleep Medication	0.272	**0.010**	0.132	0.213
PSQI - Daytime Dysfunction	0.197	0.062	0.138	0.194
PSQI - Total	0.148	0.165	0.066	0.534
ISI	0.112	0.294	-0.025	0.815

† Spearman's rank correlation test, PSQI: Pittsburgh Sleep Quality Index, ISI: Insomnia Severity Index

Table 6. Pre-Treatment Sleep-Related Subscale and Total Scores of Cases Based on the Presence or Absence of a Family History of Sleep Disorders

	No (n=45) Median (25%-75%)	Yes (n=45) Median (25%-75%)	p-value†
ESS	4.0 (1.0 – 8.0)	4.0 (1.5 – 8.5)	0.604
BRIAN - Total	41.0 (36.0 – 47.0)	43.0 (39.0 – 51.5)	0.082
PSQI			
PSQI - Subjective Sleep Quality	1.0 (1.0 – 2.0)	2.0 (1.0 – 3.0)	0.082
PSQI - Sleep Latency	2.0 (1.0 – 3.0)	2.0 (1.0 – 3.0)	0.544
PSQI - Sleep Duration	0.0 (0.0 – 2.5)	2.0 (0.0 – 3.0)	**0.006**
PSQI - Sleep Efficiency	1.0 (0.0 – 2.0)	2.0 (0.0 – 3.0)	0.129
PSQI - Sleep Disturbance	1.0 (1.0 – 2.0)	2.0 (1.0 – 2.0)	**0.004**
PSQI - Sleep Medication	0.0 (0.0 – 3.0)	0.0 (0.0 – 3.0)	0.834
PSQI - Daytime Dysfunction	1.0 (0.0 – 2.0)	2.0 (1.0 – 2.0)	**<0.001**
PSQI - Total	10.0 (5.5 – 12.0)	12.0 (8.0 – 15.5)	**0.006**
ISI	11.0 (5.0 – 14.0)	12.0 (9.5 – 19.0)	**0.010**

Descriptive statistics are presented as median (25th percentile - 75th percentile). † Mann-Whitney U test, PSQI: Pittsburgh Sleep Quality Index, ESS: Epworth Sleepiness Scale, ISI: Insomnia Severity Index, BRIAN: Biological Rhythm Interview of Assessment in Neuropsychiatry.

DISCUSSION

This study examined the sleep patterns of female psychiatric inpatients at admission and discharge, identifying factors influencing these changes. Although some improvement was observed, the majority of patients still had poor sleep quality at discharge. All patients with poor sleep quality at discharge had also reported poor sleep quality during the initial evaluation. These patients were more likely to be prescribed benzodiazepines during hospitalization, had higher unemployment rates, a greater prevalence of family history of sleep disorders, and more frequent hospital admissions. However, no significant differences in psychiatric diagnoses were found between female patients with poor and better sleep quality.

Sleep in hospital settings is significantly shorter in duration and poorer in quality compared to home, with inpatient sleep quality being notably worse on psychiatric units than on non-psychiatric units (21). Similar to our findings, studies on sleep disorders in psychiatric units report that over 40% of psychiatric inpatients experience poor sleep quality during hospitalization, with nearly half meeting the diagnostic criteria for insomnia (9, 22). Our study, which focuses on female patients, revealed higher rates and greater severity of poor sleep quality than those reported in the general literature. As previously mentioned, women, despite demonstrating resilience to sleep-disrupting cytokines, are considered a vulnerable group for sleep issues, influenced not only by social and biological factors but also by psychological distress (4,5, 23-25).

In our study, patients with poor sleep quality before hospitalization were found to have significantly lower employment rates than those with better sleep quality. This aligns with findings from another study, which reported that unemployed individuals were 2.13 times more likely to have poor sleep quality compared to employed individuals, with the likelihood increasing to 3.18 in the presence of psychopathology (26). Another key finding of our study was that individuals with poor pre-hospitalization sleep quality had a significantly higher number of psychiatric hospitalizations compared to those with better sleep quality. Addressing sleep disturbances may contribute not only to the alleviation of symptoms but also to the prevention and overall management of psychiatric disorders (27). A substantial body of research has shown that sleep disturbances are closely linked to the risk of relapse in various psychiatric disorders, and that early identification and treatment of these disturbances are associated with more favorable clinical outcomes, including fewer relapses and reduced hospitalization rates (28–31).

Our study identified a significant positive correlation between age and the PSQI sleep medication subscale score, indicating that older patients were more likely to use sleep medications. Aging is associated with gradual alterations in the physiological processes that regulate sleep (32). In particular, both the homeostatic and circadian mechanisms that govern the sleep–wake cycle tend to weaken over time, and these changes—along with a decline in melatonin levels—contribute to the natural deterioration of sleep quality in older adults (32, 33). Studies have shown that sleep medication use increases with age, with one in five elderly individuals using such medications, and the rate being higher among women (34-36).

In this study, significant associations were found between disruptions in biological rhythms and poor sleep quality, as well as increased insomnia severity. In sleep disorders, the disruption of the circadian rhythm is a syndrome in itself. It deserves a longer and better discussion in the context of psychiatric disorders, as addressing biological rhythm irregularities is crucial in the management of sleep-related issues in psychiatric populations (37). Moreover, circadian rhythm disruptions have been shown to play a multifaceted role in the development, maintenance, and progression of psychiatric disorders through genetic and biochemical mechanisms (37). However, as the data on biological rhythms in our study were collected through a self-report scale, this remains a limitation of our research.

Limitations of this study include being conducted at a single center, a relatively small sample size, and the lack of measurements related to hormonal fluctuations, which could have provided deeper insights into the relationship between sleep disturbances and biological rhythms. The reliance on subjective measures for assessing sleep quality is another significant limitation, as psychiatric disorders are well-documented to distort perceptions of sleep quality and quantity. Nevertheless, this study has several strengths, including the use of multiple sleep-specific scales, examination of subcomponents of these scales, and assessment of both pre- and post-treatment periods. The findings provide a foundation for larger-scale and more detailed future studies.

İn conclusion, this study underscores the persistent nature of sleep disturbances in female psychiatric inpatients and their links to sociodemographic, clinical, and circadian rhythm factors. Developing interventions that target gender-specific biological, psychological, and social influences, including disruptions in circadian rhythms, has the potential to enhance treatment outcomes, streamline patient care in psychiatric units, and lower hospitalization rates. Using validated scales to evaluate sleep disturbances is practical, cost-effective, and applicable to patients with diverse psychiatric diagnoses. Developing pharmacological and non-pharmacological treatment protocols tailored to address sleep disturbances is crucial, and further research in this area is warranted.

Availability of data and materials: The data sets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Ethics declarations: Ethics approval and consent to participate: This research was approved by the Ethics Committee of Recep Tayyip Erdoğan University Faculty of Medicine on 24.01.2020, with decision number 2020/03. Written informed consent was obtained from all participants after full explanation of the study steps. Patients were confirmed about the confidentiality of their data and that they were able to stop participation in the study at any time without giving reasons.

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RESEARCH ARTICLE

Organizational Change in Health Institutions: Artificial Intelligence Anxiety of Internal and Surgical Branch Physicians

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ABSTRACT

Objective: The integration of artificial intelligence applications into the health sector creates some concerns about the uncertainties in the process as well as facilitating factors in service delivery. This study investigates the interaction and changes with professional qualifications by examining AI anxiety, readiness for AI, and openness to organizational change among physicians in internal and surgical specialties.

Method: The study data were collected between September 1, 2024 and November 15, 2024 from 15 health institutions with the status of training and research hospitals on the Anatolian and European sides of Istanbul by online survey method. Valid measurement tools for data collection: Artificial Intelligence Anxiety Scale, Medical Artificial Intelligence Readiness Scale, and Organizational Openness to Change Scale were used. The distribution of variables was analyzed by Shapiro Wilk test. Differences between groups that did not show normal distribution were analyzed using Mann Whitney U and Kruskal Wallis H tests. Bonferroni correction was applied for multiple test corrections in intragroup comparisons.

Results: AI anxiety was generally moderate, with no difference between specialties. Regular follow-up of medical literature was positively correlated with decreased AI anxiety and increased readiness levels. Openness to organizational change was found to be high in both specialties.

Conclusions: AI anxiety and AI readiness are influenced by gender and following medical literature. Following academic literature and training programs are critical for building confidence in AI applications. Physicians' openness to organizational change is a facilitating factor for the best implementation of AI in clinical settings through hands-on training and scientific studies.

Keywords: Artificial Intelligence in Medicine, Education, Physician Readiness, Technological Adaptation, Organizational Change Management.

Sağlık Kurumlarında Örgütsel Değişim: Dahili ve Cerrahi Branş Hekimlerinin Yapay Zeka Kaygısı

ÖZET

Amaç: Yapay zeka uygulamalarının sağlık sektörüne entegrasyonu hizmet sunumunda kolaylaştırıcı unsurların yanı sıra süreçteki belirsizlikler de birtakım endişeler yaratmaktadır. Bu çalışma dahili ve cerrahi uzmanlık alanlarındaki doktorlar arasında yapay zeka kaygısını, yapay zekaya hazır olma ve örgütsel değişime açıklık durumlarının incelenerek mesleki nitelikleri ile olan etkileşimi ve değişimi araştırmaktadır.

Yöntem: Çalışma verileri 1 Eylül 2024 - 15 Kasım 2024 tarihleri arasında online anket yöntemiyle İstanbul'da Anadolu ve Avrupa yakasında bulunan 15 eğitim araştırma hastanesi statüsünde olan sağlık kurumundan toplanmıştır. Veri toplamada geçerli ölçme araçları olan: Yapay Zeka Kaygı Ölçeği, Tıbbi Yapay Zeka Hazırlık Bulunuşluk Ölçeği ve Örgütsel Değişime Açıklık ölçeği kullanılmıştır. Değişkenlerin dağılımı Shapiro Wilk testi ile incelenmiştir. Normal dağılım göstermeyen gruplar arasındaki farklar Mann Whitney U ve Kruskal Wallis H testleri ile analiz edilmiştir. Grup içi karşılaştırmalarda çoklu test düzeltmesi için Bonferroni düzeltmesi uygulanmıştır.

Bulgular: Yapay zeka kaygısı genel olarak orta düzeydeyken uzmanlık alanları arasında bir farklılık tespit edilmemiştir. Tıbbi literatürün düzenli takibi, yapay zeka kaygısının azalması ve hazır olma seviyelerinin artması ile pozitif korelasyon göstermiştir. Her iki uzmanlık alanında örgütsel değişime açıklığın yüksek olduğu belirlenmiştir.

Sonuç: Yapay zeka kaygısı ve yapay zekaya hazır bulunuşluk cinsiyet ve tıbbi literatürü takip etme faktörlerinden etkilenmektedir. Akademik literatürü takip etme ve eğitim programları yapay zeka uygulamalarına olan güveni oluşturmak için kritik öneme sahiptir. Hekimlerin örgütsel değişime açık olması; uygulamalı olarak yapılacak eğitimlerin ve bilimsel çalışmaların yapay zekanın klinik ortamlarda en iyi şekilde uygulanmasında kolaylaştırıcı bir etkendir.

Anahtar Kelimeler: Tıpta Yapay Zeka, Eğitim, Hekimin Hazır Bulunuşluğu, Teknolojik Adaptasyon, Organizasyonel Değişim Yönetimi.

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INTRODUCTION

In today's world, where technological innovations and changes are advancing rapidly, an important development that has come to the fore frequently in various sectors in recent years is artificial intelligence (AI) and its sub-branch, machine learning. Artificial intelligence is applied in almost every sector in order to produce solutions to complex problems (1). The main goal of machine learning is to design algorithms that improve with experience and can continuously learn from new data and insights and find answers to various questions (2). Machine learning seeks various combinations by extracting rules from data and considering a large number of variables to reliably predict outcomes with the algorithms it creates (3). These characteristics make machine learning, and therefore artificial intelligence, a very interesting technology.

The healthcare industry is dynamic, generating large amounts of data at a rapid pace and at the same time making decisions that take into account a large number of variables. In recent years, the use of artificial intelligence in healthcare has been increasing and provides many advantages (4). In medicine, artificial intelligence is widely used in the creation of clinical decision support systems. It enables the development of decision support systems that can increase learning capacity and transform the future of healthcare (2). Furthermore, AI has been effectively applied in many fields such as disease diagnosis, prognosis, treatment optimization, outcome prediction, drug development and public health (2,4–9).

Artificial intelligence applications are becoming widespread in internal and surgical fields of medicine. The largest application of AI algorithms is in radiology, but there are also examples of applications in other fields such as dermatology, ophthalmology, psychiatry, cardiology, oncology, neuroscience, pathology, and epigenetics (1–4). The integration of AI into medicine has brought awe-inspiring changes but has also raised significant concerns among physicians (5,6). However, concerns such as the low acceptability of AI as a digital health intervention among medical professionals, lack of user convenience and engagement, ethical and privacy issues, unreliability of the technology, professional liability threaten to prevent the realization of promising benefits. Understanding the factors underlying the acceptability of AI will be vital for medical institutions to identify gaps and areas for improvement in their AI implementation strategies (5,7,8). Research has highlighted that these concerns vary across specialties, with different levels of exposure and reliance on AI technologies. For example, internal medicine physicians, who rely heavily on AI tools in their diagnostic and decision-making processes, frequently express concerns about the technology's potential to overshadow their expertise and autonomy. The study by Mansoor et al. (9) highlights concerns among internal medicine practitioners about the increasing role of AI in diagnostic accuracy and its implications for clinical judgment. Similarly, Simone et al. (10) reveal that surgeons view AI as “a double-edged sword”, recognizing its potential in trauma and emergency settings, while expressing uneasiness about ethical issues and the associated with its adoption (11). In addition to these concerns, Johnson-Mann et al. (12) highlight how AI-driven systems in surgical procedures raise questions about accountability for errors, further increasing hesitancy among practitioners in high-risk areas. These findings suggest that variation in AI readiness and anxiety is driven by specialty-specific interactions with AI technologies, underscoring the need for targeted training and support strategies. In fact, it suggests that variation in AI readiness and anxiety is driven by specialty-specific interactions with AI technologies, underscoring the need for targeted training and support strategies.

To investigate these dynamics, the study examined physicians' perceptions of AI using validated instruments, namely the Artificial Intelligence Anxiety Scale (AIAS), the Openness Toward Organizational Change Scale (OTOCS) and the Medical Artificial Intelligence Readiness Scale (MAIRS). Through a comparison between internal and surgical branch physicians, it was targeted to examine physicians' reactions to AI. It is aimed to determine whether organizational openness to change and having knowledge about AI affect AI anxiety in physicians and whether the field of specialization has an effect on AI anxiety.

MATERIAL AND METHODS

This study was designed as a cross-sectional study. The sample was determined by identifying the hospitals with the status of “training and research hospital” on the Anatolian and European sides of Istanbul. Of the 44 hospitals, 22 were selected by simple random draw method. The managers working in these hospitals were contacted and requested to support the study through online communication tools. Of the managers who accepted our interview request, 15 agreed to support the study. Data were collected through an online survey between September 1, 2024 and November 15, 2024 and 403 physicians participated in the survey. Physicians working in Istanbul and having a specialty in one of the medical branches were included in the study. Questions regarding inclusion criteria were added to the survey questions and these criteria were checked. . Approval for the study was obtained from the Health Sciences University Hamidiye Scientific Research Ethics Committee (28.08.2024-31181) and voluntary informed consent was obtained from the participating physicians.

The OTOCS (max: 30) used in this study has a structure consisting of a single dimension and a total of 6 items (13). The AIAS (max: 147) consists of four sub-dimensions (Learning, Job Replacement, Sociotechnical Blindness and AI Configuration) and contains 21 items in total (14,15). The MAIRS (max: 110) consists of four dimensions (Cognition, Ability, Vision, and Ethics) and has a total of 22 items (16). The scales were applied to assess physicians' concerns about AI, their level of readiness and their openness to organizational change.

The internal consistency of the MAIRS developed to measure the readiness levels of medical students in the field of medical AI was evaluated with Cronbach's alpha coefficient and found to be α=0.87, which indicates that the scale is highly reliable (16). Construct validity was tested with confirmatory factor analysis (CFA), and CFA results showed that the four-factor model of the scale was compatible with the data (χ^2/df = 3.81, RMSEA = 0.094, SRMR = 0.057, CFI = 0.938, NNFI (TLI) = 0.928), so it can be said that the scale exhibits a valid structure.

The AIAS was developed to determine the level of anxiety towards AI technologies and the internal consistency of the scale was evaluated with Cronbach's alpha coefficient and found to be α=0.96, this high coefficient indicates that the scale has a strong internal consistency (14). Construct validity was examined by exploratory factor analysis (EFA) and CFA, and CFA findings revealed that the four-factor structure of the scale was confirmed. Goodness of fit indices were found to be acceptable (χ^2 / df = 2.57, TLI = 0.93, CFI = 0.94, RMSEA = 0.084, SRMR = 0.069).

The internal consistency of OTOCS, which was developed to assess the level of openness to organizational change, was evaluated with Cronbach's alpha coefficient and it was determined as α=0.845 for the industrial sector, α=0.857 for the education sector and α=0.921 for the health sector (13). These high coefficients indicate that the scale is a reliable measurement tool. In terms of validity, content validity was ensured in line with expert opinions. Construct validity was tested with EFA and CFA methods and CFA findings showed that the one-factor structure of the scale was confirmed. Within the scope of criterion dependent validity, significant correlations were found between leader support and openness to organizational change, and these findings reveal that the scale exhibits a valid structure.

Statistical Analysis: Statistical analyses were performed using SPSS 25.0 software (IBM Corp., 2017; IBM SPSS Statistics for Windows, version 25.0, Armonk, NY, USA). Descriptive statistics are presented as mean±standard deviation or median (min-max) values according to the normal distribution of the data. The distribution of variables was analyzed by Shapiro Wilk test. Differences between groups that did not show normal distribution were analyzed with Mann Whitney U and Kruskal Wallis H tests. Bonferroni correction was applied for multiple test correction in intragroup comparisons. Reliability analyses of the scales were evaluated with Cronbach's α coefficient and the confidence level was determined as 95%.

RESULTS

Among the physicians participating in the study, 60.3% were female. When the distribution of specialty areas was examined, it was aimed to have a balanced distribution in accordance with the purpose of the study and as a result, 49.4% of the physicians were specialized in surgery and 50.6% in internal medicine. The rate of having an academic title among the physicians participating in the study was 81.4% and 31.3% of the physicians were in the university staff and 98% of the physicians stated that they followed the medical literature, although the frequency of follow-up varied (Table 1).

Table 1. Participants' demographic characteristics and Scale Scores

	Frequency (n)	**Percentage (%)**
Gender		
Male	160	39.7
Woman	243	60.3
In which field are you specialized		
Surgical medical sciences	199	49.4
Internal medical sciences	204	50.6
Academic title ownership		
There is	328	81.4
No	75	18.6
Cadre status		
University staff	126	31.3
I am not on the university staff	277	68.7
How often do you follow medical literature or new studies in the field?		
2-3 days a month	202	50.1
2-3 days a week	193	47.9
I don't have time to follow	8	2
	Average	**Standard Deviation**
Age	48.49	8.89
How many years in the profession	17.15	8.28
AIAS	64.32	34.26
Learning	24.63	12.93
Job Replacement	18.31	10
Sociotechnical Blindness	12.29	6.81
AI configuration	9.09	5.15
MAIRS	99.2	12.64
Cognition	35.36	4.85
Ability	36.42	4.81
Vision	13.6	2.06
Ethics	13.83	1.68
OTOCS	27.61	2.64

The reliability analysis results of the scales used in the study are presented in Table 2. Moreover, it was determined that the scales and sub-dimensions were not normally distributed in the results of the Shapiro Wilk test and the tests used are given in Table 2.

Table 2. Scale results and comparison between groups

		Gender			Branch			Academic Title Ownership			*Frequency of following medical literature or new studies in the field*			
Scales and Dimensions	**Cronbach a**	**Male**	**Woman**	**p**	**Surgery**	**Internal**	**p**	**Yes**	**No**	**p**	**2-3 times a month**	**2-3 times a week**	**To follow I don't have time**	**p**
AIAS	0.993	50(21-147)	52(21-147)	**0.01†**	51(21-147)	51.5(21-147)	0.769†	51(21-147)	50(21-147)	0.400†	51(21-147)	52(21-147)	72(42-144)	0.087‡
Learning	0.984	19.5(8-56)	20(8-56)	**0.001†**	20(8-56)	20(8-56)	0.381†	20(8-56)	20(8-56)	0.199†	20(8-56)	20(8-56)	26.5(14-55)	0.439‡
Job Replacement	0.981	14(6-42)	15(6-42)	**0.021†**	14(6-42)	14(6-42)	0.401†	14(6-42)	14(6-42)	0.419†	14(6-42)	14(6-42)	23(12-42)	0.08‡
Sociotechnical Blindness	0.976	9(4-28)	10(4-28)	**0.033†**	9(4-28)	10(4-28)	0.43†	9(4-28)	10(4-28)	0.733†	9(4-28)$_{a}$	10(4-28)$_{a.b}$	14.5(8-28)$_{b}$	**0.032‡**
AI configuration	0.973	7(3-21)	7(3-21)	**0.007†**	7(3-21)	7(3-21)	0.977†	7(3-21)	7(3-21)	0.198†	7(3-21)	7(3-21)	11.5(3-21)	0.063‡
MAIRS	0.97	102(36-110)	104(42-110)	**0.004†**	104(43-110)	103(36-110)	0.19†	104(36-110)	100(44-110)	**0.002†**	104(43-110)	103(36-110)	63.5(44-109)	**<0.05‡**
Cognition	0.916	36.5(11-40)	37(16-40)	**0.008†**	37(15-40)	37(11-40)	0.404†	37(11-40)	36(16-40)	**0.023†**	37(15-40)	37(11-40)	24(16-39)	**0.019‡**
Ability	0.936	38(10-40)	38(15-40)	**0.001†**	38(16-40)	38(10-40)	0.137†	38(10-40)	37(15-40)	**<0.01†**	38(15-40)$_{a}$	38(10-40)$_{b}$	24(16-40)$_{a.b}$	**0.004‡**
Vision	0.874	14(4-15)	14(5-15)	**<0.001†**	14(6-15)	14(4-15)	0.307†	14(4-15)	14(5-15)	**0.004†**	14(6-15)	14(4-15)	8.5(6-15)	0.102‡
Ethics	0.806	14(6-15)	14(6-15)	0.147†	14(6-15)	14(6-15)	0.583†	14(6-15)	14(6-15)	**0.016†**	14(6-15)$_{a.b.c}$	14(6-15)$_{b}$	9(6-15)$_{c}$	**0.003‡**
OTOCS	0.825	28(10-30)	28(18-30)	**0.014†**	28(17-30)	28(10-30)	0.916†	28(10-30)	28(17-30)	0.278†	28(10-30)	28(17-30)	26(19-30)	**0.029‡**

†: Mann-Whitney U test. ‡: Kruskall Wallis H test, $^{a-c}$: Represents group memberships in Post Hoc test results.

The Cronbach's Alpha (α) value of the AIAS scale was found to be 0.993, which indicates that the scale is highly reliable. When the sub-dimensions of the scale are examined; the α value of the Learning dimension is 0.984, the Job replacement dimension is 0.981, the Sociotechnical Blindness dimension is 0.976 and the AI Configuration dimension is 0.973.

The overall reliability coefficient of the MAIRS was calculated as 0.97. Considering its sub-dimensions; the α value of the Cognition dimension is 0.916, the Ability dimension is 0.936, the Vision dimension is 0.874, and the Ethics dimension is 0.806 825. The reliability coefficient of the third scale, OTOCS, was found to be 0.82. The Cronbach's Alpha values presented in Table 2 show that the scales and sub-dimensions used are highly reliable.

As a result of the analysis, it was determined that the AIAS of female participants were significantly higher than male participants in the and its sub-dimensions ($p<0.05$). On the other hand, no significant difference was found between the scale scores of physicians in surgical and internal units ($p>0.05$), which indicates that anxiety levels are similar between branches.

The scores of the participants with academic titles were found to be higher than those without an academic title in the MAIRS and its sub-dimensions. This indicates that being involved in scientific activities may increase readiness for AI. As a matter of fact, the frequency of following the medical literature or new studies in the field also led to significant differences in the results of the MAIRS ($p<0.05$). It was found that the MAIR scale scores of those who followed the literature were significantly higher than those who did not follow the literature. On the other hand, for the OTOCS, there is a statistically significant difference between the groups according to the frequency of following the literature, but no difference was found between the groups ($p>0,05$). In this context, it shows that regular literature follow-up and frequency of access to information are effective in having a positive attitude towards artificial intelligence and in the level of openness to organizational change.

As a result, the findings of the analyses show that the frequency of following medical literature, academic title and gender variables are effective on AI anxiety and AI readiness levels. On the other hand, it was concluded that the frequency of following medical literature is effective on openness to organizational change.

DISCUSSION

In this study, in order to evaluate physicians' attitudes towards artificial intelligence, it was aimed to determine their openness to organizational change, their level of readiness for medical artificial intelligence and their concerns about artificial intelligence, as well as to reveal the factors affecting these attitudes. Moreover, determining whether there are differences between branches is also among the aims of the study.

When the studies in the literature are examined, differences in the adoption of AI applications between internal and surgical branches have been addressed as an important research topic in the literature. Various findings have been found that internal branch physicians adopt the potential of AI to support diagnosis and treatment processes faster than surgical branches (9,17,18). It is emphasized that although AI is a promising tool in the fields of robotics and imaging, surgeons are inevitably cautious due to technical complexities and occupational safety concerns (9,10,18,19). Similarly, Wahl et al. (17) point out that data-driven approaches increase the effectiveness of AI in internal branches, while user trust and lack of technical infrastructure limit integration in surgical branches. These findings reveal that AI applications have different dynamics between branches and that these differences should be addressed through educational and technological approaches. As researchers, our expectation was that internal medicine physicians would encounter artificial intelligence applications more frequently than surgical physicians. However, the findings show that this difference did not have a significant effect on anxiety levels. On the other hand, internal branch physicians perform less complex interventional procedures compared to surgical branch physicians and it is known that AI has a greater potential in terms of interfering with their clinical autonomy. However, the data obtained showed that there was no significant difference between the branches in terms of anxiety level. It is understood that the main difference is due to the differences in the decision-making and implementation processes of the branches (9,10,17–19).

In the scale evaluations made without any distinction of branch, it was determined that physicians do not have a serious concern about AI. In addition, they were found to be open to organizational change, which shows that physicians are not afraid of the innovations that artificial intelligence will bring and have a high potential to adapt to these changes.

The scores of the participants with academic titles on the scale and its sub-dimensions of the MAIRS were found to be significantly higher than those of the participants without academic titles. This finding indicates that physicians who are actively involved in academic activities follow new developments more closely and develop a conscious attitude towards these developments. Similarly, the increased frequency of following the medical literature facilitates physicians to be prepared for artificial intelligence.

Following the literature increases physicians' understanding and foresight in this field by providing a broad framework of knowledge on artificial intelligence. On the other hand, it is stated that inadequate AI education may cause anxiety. Addressing this anxiety with targeted training programs is an important factor in increasing physicians' confidence in AI applications (10). Hopson et al. (20), who conducted a pilot study on AI literacy, emphasize the positive results of studies conducted in collaboration with medical students, computer scientists, AI experts. It is stated that the multidisciplinary approach will open a door to enable optimal utilization of the potential areas of medicine (personalized medicine, quality of patient care, accurate diagnosis, etc.) and AI (20).

As the integration of artificial intelligence into clinical processes is experienced by clinicians, uncertainties about these technologies are expected to decrease (20). Although the applications of artificial intelligence in clinical systems are still very new, adapting these technologies according to the feedback and criticism of physicians is critical to increase the benefits to be obtained. Similarly, Pedro et al. (18) emphasize the role of interdisciplinary collaboration in increasing clinicians' AI skills (21).

Yin et al. (11), who found that institutional AI readiness nurtures behavior that supports innovation, also brings up institutional openness to change. Experiencing a critical change and transformation such as AI in organizations will of course bring some difficulties in managing it. At the employee level, there are factors that affect the acceptance, management or resistance to this change (22). As a result of this study, it was found that organizational openness to change was higher in physicians who regularly follow the medical literature. In this context, the important role of access to information and information sharing in reducing resistance to change is emphasized. On the other hand, it is inevitable to equip physicians with the necessary skills and emphasize the need for special training programs to overcome the lack of knowledge about AI tools, to build trust and to use them effectively (9,10,23).

Limitations

Although the findings of this study provide important implications, there are some limitations. First, the study was conducted with only 403 physicians working in Istanbul and the results may not be generalizable to physicians in different geographical regions or different health systems. Secondly, a cross-sectional design was used and AI anxiety, readiness and organizational change should be examined with causality analyses along with other possible variables.

CONCLUSION

According to the findings of the study, there is no statistically significant difference between internal and surgical branch physicians in terms of AI anxiety. Similarly, there is no significant difference between the branches in terms of the level of OTOC and the level of MAIRS. On the other hand, it was concluded that regular follow-up of academic articles had a significant positive effect on physicians' level of MAIR.

As a result of the study, it was determined that academic articles following and having information affects the openness to organizational change and reduces the concerns arising from uncertainties. In this context, first of all, the balance of technology and human reasoning should be ensured in the researches to be conducted together with the training programs. Fields of application should be established and the functioning should be explained to physicians with concrete examples. Of course, there are uncertainties and areas that need to be resolved. Ethics, legal framework and security are some of them. These topics are seen as important elements of AI that should be the subject of further studies.

The data obtained shows that physicians are interested in AI. However, it is difficult to predict how the results will evolve when a larger sample is reached. Nevertheless, in order to be prepared for this transition period, health systems should gradually implement similar studies and continuously monitor their feedback. The most important emphasis here should be on the feedback to be received from healthcare personnel who use AI and are in a decision-making position.

This research opens many potential avenues for studies on AI anxiety and readiness. In future research, it is recommended to conduct similar studies on physicians in different health systems and in different countries. Such studies may reveal how cultural and systemic differences affect physicians' attitudes towards AI. In addition, it may be important to examine the differences in anxiety and readiness towards artificial intelligence according to professional experience levels (e.g., between senior physicians and beginners). Similarly, the attitudes of physicians in different specialties towards artificial intelligence can be evaluated in more detail.

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RESEARCH ARTICLE

Cost Analysis of COPD: A Case Study in Düzce University Hospital

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ABSTRACT

Objective: The aim of the study is to analyze the costs of Chronic Obstructive Pulmonary Disease (COPD) from the perspective of the Social Security Institution (SSI).

Method: In the research, data obtained retrospectively using the qualitative method were subjected to document analysis. The study covers 241 COPD patients in 2022 in the Chest Diseases unit of Düzce University Health Application and Research Center/Hospital. No sample was selected in the research, but the entire population was used. Data were subjected to multivariate regression analysis. Costs include examinations, medical supplies, medications, imaging and laboratory tests.

Results: Of 130 outpatients, 110 (85%) were male, 20 (15%) were female, the mean age was 66.82 years, and outpatient treatment cost was 127.76₺ ($7.72)/patient. Of the 111 inpatients, 88 (79%) were male, 23 (21%) were female, the mean age was 70.19 years, and the mean duration of hospitalization was 7.08 days. The average total treatment cost of the clinic was 2,319.64₺ ($140.16)/patient. Of this, 1,059.97 ₺ ($64.05) was for intervention, 267.62 ₺ ($16.17) for medical supplies, 907.74 ₺ ($54.85) for medication, and 499.98 ₺ ($30.21) for investigations. It was determined that the gender, age, and hospitalization duration of the patients changed the treatment costs ($p<0.05$). In addition, it was determined that the SSI incurred an average annual drug cost of 6,321.84 ₺ ($381.98). A total annual average cost of 9,184.90 ₺ ($554.98) /patient was determined.

Conclusions: The study found that treating COPD is a significant economic burden per patient for the SSI. A significant portion of this cost is comprised of medication expenses. This increases the lifetime costs of COPD. In order to reduce the cost of the disease, both necessary measures should be taken to reduce the risk of developing the disease, and lower-cost methods should be followed in the treatment of the disease.

Keywords: Chest Diseases, COPH, Cost of Disease.

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KOAH’ın Maliyet Analizi: Düzce Üniversitesi Hastanesinde Bir Vaka Çalışması

ÖZET

Amaç: Kronik Obstrüktif Akciğer Hastalığının (KOAH) maliyetlerini Sosyal Güvenlik Kurumu (SGK) perspektifi açısından hesap etmektir.

Yöntem: Araştırmada, nitel yöntem kullanılarak retrospektif olarak elde edilen veriler doküman analizine tabi tutulmuştur. Çalışma, Düzce Üniversitesi Sağlık Uygulama ve Araştırma Merkezi/Hastanesi Göğüs Hastalıkları biriminde 2022 yılına ait 241 KOAH hastasını kapsamaktadır. Araştırmada örneklem seçilmemiş evrenin tamamı çalışmaya dahil edilmiştir. Veriler, çok değişkenli regresyon analizi yapılmıştır. Maliyetler, muayene, tıbbi malzeme, ilaç, görüntüleme ve laboratuvar testlerini içermektedir.

Bulgular: Ayaktan tedavi gören 130 hastanın 110’u (%85) erkek, 20’si (%15) kadın, yaş ortalaması 66,82 yıl olup poliklinik tedavi maliyeti 127,76₺($7.72)/hastadır. Yatarak tedavi gören 111 hastanın 88’i (%79) erkek, 23’ü (%21) kadın, yaş ortalaması 70,19 yıl olup ortalama yatış süresi, 7,08 gündür. Klinik toplam tedavi maliyeti ortalama 2.319,64₺($140.16)/hasta olmak üzere bunun 1.059, 97 ₺ ($64.05)’si müdahale, 267,62 ₺($16,17)’si tıbbi malzeme, 907,74 ₺($54.85)’si ilaç ve 499.98 ₺($30.21)’si tetkik tutarından oluşmaktadır. Hastaların cinsiyeti, yaşı ve yatış sürelerinin tedavi maliyetlerini değiştiği belirlenmiştir ($p<0,05$). Ayrıca SGK’nın yıllık ortalama 6.321,84 ₺ ($381.98) ilaç giderine katlandığı tespit edilmiştir. Hasta başına toplam yıllık ortalama 9.184,90 ₺ ($554.98)/hasta maliyeti tespit edilmiştir.

Sonuç: Çalışmada KOAH’ın tedavi edilmesinde SGK açısından hasta başına önemli bir ekonomik yük olduğu tespit edilmiştir. Bu maliyetin önemli bir kısmını ilaç giderleri oluşturmaktadır. Bu da KOAH’ın ömür boyu maliyetlerini artırmaktadır. Hastalık maliyetinin düşürülmesinde hem hastalığa yakalanma riskinin azaltılması için gerekli tedbirlerin alınması hem de hastalığın tedavisinde daha düşük maliyetli yöntemler izlenmelidir.

Anahtar Kelimeler: Göğüs Hastalıkları, KOAH, Hastalık Maliyeti.

This study was prepared using the Master's Thesis titled "Cost Analysis of Asthma and COPD Diseases: A Case Study at Düzce University Hospital" written by the first author under the supervision of the second author.

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INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is one of the most important chronic diseases of the respiratory system, which is not fully reversible and usually progresses slowly. It comprises a spectrum of diseases, including chronic bronchitis, emphysema, long-standing and irreversible asthma, and small airway disease (1).

A complex interaction between environmental factors and genetic factors causes COPD. The most important cause of the disease is smoking, as well as indoor air pollution and occupational exposure. In addition, other risk factors such as malnutrition, poverty, and inactivity play a role in the development of the disease (2).

COPD is a significant cause of mortality and morbidity in the world and in our country, as well as imposing a significant burden on the health system and society. According to 2021 data from the World Health Organisation (WHO), COPD is the fourth leading cause of death worldwide, causing 3.5 million deaths in 2021, approximately 5% of all global deaths (3). It is estimated that there are 5 million COPD patients in Tükiye, but it should not be forgotten that there are many patients living without being diagnosed (4).

COPD cases in the chronic diseases group are gradually increasing worldwide and in our country. Early diagnosis of diseases and education for disease management are essential in reducing costs.

Chronic diseases are among the health problems that consume the most resources in health systems. While the global disease cost of COPD was 2.1 trillion dollars in 2010, this cost is estimated to be 4.8 trillion dollars in 2030 (5).

COPD, which is one of the leading causes of morbidity and mortality worldwide, constitutes a significant economic burden on individuals and society (6). The cost of COPD includes all medical and non-medical direct and indirect costs. Direct medical costs include examination, diagnosis, and treatment expenditures. Indirect costs include lost labor force, decreased productivity, and decreased quality of life.

Cost of illness aims to identify and measure all costs of a particular disease, including direct, indirect, and intangible dimensions (7). Knowing a disease's cost helps policymakers decide which diseases should be addressed primarily with health services and prevention policy (8).

Increases in disease costs are an economic burden for society regarding hospitals, reimbursement institutions (SSI and insurance companies), patients and their relatives, other state institutions, employers, and third parties. In analyzing the social cost of a disease, all perspectives should be considered, and all direct and indirect medical and non-medical costs incurred should be calculated.

This study aims to analyze the costs of examinations, medical supplies, medicines, and examinations and continuously used medicines arising from treating COPD from the perspective of SSI, the reimbursement institution, and to guide health policymakers in their decisions by calculating direct medical costs.

MATERIAL AND METHODS

Scope and Design of the Study: For this study, approval number 429 dated 20/10/2022 was obtained from the ethics committee. This retrospective study was conducted at the Düzce University Health Application and Research Centre/Hospital (DUHARH). DUHARH is the only tertiary education and research hospital in the province and has 316 beds. The scope of the study consisted of 241 COPD patients treated in outpatient (130 patients) and clinic (111 patients) at the DUHARH Chest Diseases unit in 2022. COPD patients in the intensive care unit were omitted. No sample was selected for the study, individuals who were reachable and volunteered to participate during the study were included in the study. In terms of SSI perspective, the study includes patients who benefit from health services free of charge within the scope of General Health Insurance (GHI), taking into account the pricing policy made according to the Health Practice Communiqué (HPC) price tariff.

This study was carried out in accordance with the Helsinki Declaration. Artificial intelligence (AI)-enabled technologies (such as Large Language Models [LLM], chatbots, or image generators) were not used in the production of the work.

Costs: In Tükiye, patients with health problems caused by COPD exacerbation can benefit from health services provided free of charge under the GHI. SSI finances expenditures related to the health care of these patients. In this context, expenses incurred by hospitals are collected from the SSI. Price regulation is applied in the collection process, and this regulation is realized through HPC. HPC prices are paid to hospitals for certain services determined by the SSI on condition that the methodology invoices them, and it is a detailed pricing practice determined on a package basis (9). Within this practice, the invoice amount, including direct medical costs, consists of medication, medical supplies, interventions, and examinations. In addition, the costs of medication for COPD, which is a chronic disease used continuously outside the hospital, were also included in the study. The prices in the study were calculated in Turkish Lira, and the average exchange rate of the Central Bank of the Republic of Tükiye for 2022 as \$1=16.55 ₺ and €1=17.36 ₺ (10).

The data obtained retrospectively through the hospital automation system were analyzed using document analysis and a bottom-up approach (11). In this approach, detailed activity data are used to estimate unit costs. More accurate results are obtained since it is assumed that resources are considered more comprehensively when providing a particular service (12).

Statistical Analysis: The study's datas were conducted with the EViews 10.0 (Quantitative Micro Software) econometric analysis program (Timberlake Consultants Limited, The Loft, 2C Blake Mews, United Kingdom). In the study where multivariate regression analysis was performed, there are coefficients calculated by the maximum likelihood method. (OLS). In the study, multiple linear regression analysis was used if there were two or more independent variables such as gender. This analysis was conducted by correlating the cost factors of outpatient and inpatient patients admitted to the hospital due to COPD exacerbation with gender, age, and length of hospital stay. According to the regression analysis, if the p value obtained was below 0.05, it was accepted that there was a significant relationship between two variables. Additionally, validity and reliability analyses of the study were performed and shown in the tables.

The model of the study is as follows (13).

$Yi = \beta 1 + \beta 2X2i + \beta 3X3i + \ldots + ui$

Yi: total costs, medicine costs, intervention costs, material costs, examination costs

β1: Intercept/constant X2i: gender X3i: age X4i: hospitalization duration

Research Limitations: The study's data is limited to a tertiary university hospital in Tükiye. This study is limited to the direct treatment costs of COPD incurred by SSI. This study covers the direct treatment costs of COPD incurred by SSI. From the SSI perspective, the cost of illness includes not only direct medical costs but also non-medical costs. Direct non-medical costs incurred by SSI, such as report fees, disability pension, funeral allowance, death benefit, incapacity income payment, part-time working allowance, traveling and daily expenses, companion expenses, and unemployment payments, are not included in the scope of the study.

The study calculated as an approximate average the daily and per patient costs of the disease. Each patient hospitalized for the same disease consumes hospital resources (cost elements) in different ways. This criterion was not taken into account because the HPS pricing policy established by SSI is not suitable for this. In the study, the treatment of each patient's comorbidities was not considered.

Other limitations of the study are as follows: Firstly, the study was conducted in a tertiary university hospital. Secondly, the participants were selected from patients aged 18 years and over. Thirdly, the study focused on the data of outpatients and inpatients with COPD admitted to the hospital on the dates identified. More importantly, the data were obtained only from hospital records and included patients within the working hours of the study unit (excluding patients who underwent private examinations, especially after 17.00, and the fees charged for them). Finally, the study is limited to data for the year 2022.

RESULTS

In the study, there are two variables affecting cost factors in outpatient treatment, namely gender and age, and three variables affecting cost factors in inpatient treatment, namely gender, age, and length of stay.

Gender: The male 1, Female 0 hypothesis was used to analyze the effect of being male on costs.

There is a problem of varying variance in all models. This reduces the confidence in the coefficients. However, the results can be interpreted in terms of general trends.

The total amount invoiced to SSI for HPS, the costs of interventions, investigations (imaging and laboratory), drugs, and medical supplies, and the relationship between these cost elements and the variables are statistically shown in the tables below.

Table 1. The effect of gender and age of outpatients on the total invoiced amount

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Gender	23.70316	28.87159	0.820986	0.4132
Age	-3.449950	0.873893	-3.947793	0.0001
C	338.2181	65.62393	5.153884	0.0000
R-squared	0.116659	Prob(F-statistic)		0.000379
F-statistic	8.386158	Durbin-Watson stat		1.324420
F-statistic	7.624212	Prob. F(2,125)		0.0008
F-statistic	10.14427	Prob. F(2,127)		0.0001

The effect of gender on total cost is insignificant (Prob>0.05). In other words, gender discrimination does not affect the total invoice amount. On the other hand, a one-year increase in the patient's age decreases the total invoice amount by 3.44 ₺ (Table 1). In addition, the effect of age on total billing costs of inpatients was found to be statistically insignificant (Prob > 0.05) (Table 7).

Table 2. Descriptive data of dependent and independent variables of outpatients

	Invoice amount (₺)	Gender	Age
Mean	127.7648	0.846154	66.81538
Median	99.00000	1.000000	67.00000
Maximum	627.7500	1.000000	95.00000
Minimum	7.820000	0.000000	27.00000
Std. Dev.	125.1019	0.362197	11.96622
Skewness	2.069837	-1.918806	-0.192898
Kurtosis	7.602594	4.681818	3.559259
Jarque-Bera	207.5708	95.09384	2.500377
Probability	0.000000	0.000000	0.286451
Sum	16609.43	110.0000	8686.000
Sum Sq. Dev.	2018913.	16.92308	18471.57
Observations	130	130	130
Total Cost (₺), ($)	16.609,43 ($1,008.49)		

In the pricing of outpatients, only the total invoice amount was considered in the calculation since the package price application (including examination, medication, and examination amounts) is according to the HPC price tariff. Of the 130 patients who applied to the hospital as outpatients for COPD treatment, 110 (85%) were male and 20 (15%) were female. The average age of all patients was 66.82 years. The highest invoice amount was 627.75₺/patient, and the lowest was 7.82₺/patient. The average bill amount per patient was 127.76 ₺ ($7.72) /patient (Table 2).

Table 3. The effect of gender, age, and hospitalization duration on the intervention amount of inpatients with COPD

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Gender	-744.7044	385.7297	-1.930638	0.0562
Age	5.744515	19.16385	0.299758	0.7649
Hospitalization Duration	231.1021	29.56506	7.816732	0.0000
C	-389.3445	1421.687	-0.273861	0.7847
R-squared	0.379938	Prob(F-statistic)		0.000000
F-statistic	21.85448	Durbin-Watson stat		1.945515
F-Statistic	1.287744	Prob F(2,105)		0.2802
F-statistic	7.549110	Prob. F(3,107)		0.0001

The effect of gender and age on the intervention cost is statistically insignificant (Prob > 0.05). However, hospital stays for an additional day increase the intervention cost by 231.10₺/day (Table 3).

Table 4. The effect of gender, age, and hospitalization duration on the cost of intervention in inpatients with COPD

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Gender	-56.20540	100.8063	-0.557558	0.5783
Age	10.02319	5.008265	2.001330	0.0479
Hospitalization Duration	77.72980	7.726506	10.06015	0.0000
C	-709.4827	371.5425	-1.909560	0.0589
R-squared	0.511886	Prob(F-statistic)		0.000000
F-statistic	37.40372	Durbin-Watson stat		1.164403
F-statistic	11.97665	Prob. F(2,105)		0.0000
F-statistic	9.560646	Prob. F(3,107)		0.0000

The effect of gender on examination cost is statistically insignificant (Prob>0.05). On the other hand, an additional age increases the cost of examination by 10.02₺/year. Staying in the hospital for an additional day increases the examination cost by 77.72₺/day (Table 4).

Table 5. The effect of gender, age, and hospitalization duration on the amount of medication in inpatients with COPD

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Gender	-41.14409	152.9289	-0.269041	0.7884
Age	8.132663	7.597825	1.070394	0.2869
Hospitalization Duration	142.7627	11.72155	12.17950	0.0000
C	-641.4555	563.6513	-1.138036	0.2576
R-squared	0.591898	Prob(F-statistic)		0.000000
F-statistic	51.72980	Durbin-Watson stat		1.662131
F-statistic	1.695032	Prob. F(2,105)		0.1886
F-statistic	1.890122	Prob. F(3,107)		0.1356

The effect of gender and age on drug cost is statistically insignificant (Prob > 0.05). However, each additional day of hospitalization increases the medication cost by 142.76₺/day (Table 5).

Table 6. The effect of gender, age, and hospitalization duration on the cost of medical supplies in inpatients with COPD

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Gender	-25.09293	72.75752	-0.344884	0.7309
Age	-1.999486	3.614744	-0.553147	0.5813
Hospitalization Duration	32.09818	5.576651	5.755817	0.0000
C	200.5835	268.1630	0.747991	0.4561
R-squared	0.236578	Prob(F-statistic)		0.000002
F-statistic	11.05283	Durbin-Watson stat		1.301516
F-statistic	7.740272	Prob. F(2,105)		0.0007
F-statistic	6.858478	Prob. F(3,107)		0.0003

The effect of gender and age on the cost of medical supplies is statistically insignificant (Prob>0.05). However, each additional day of hospitalization increases the cost of supplies by 32.09₺/day (Table 6).

Table 7. The effect of gender, age, and hospitalization duration on the invoice amount of inpatients with COPD

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Gender	-867.1468	432.9098	-2.003066	0.0477
Age	21.90088	21.50786	1.018274	0.3108
Hospitalization Duration	483.6928	33.18127	14.57729	0.0000
C	-1539.699	1595.579	-0.964978	0.3367
R-squared	0.675940	Prob(F-statistic)		0.000000
F-statistic	74.39539	Durbin-Watson stat		1.582319
F-statistic	2.496361	Prob. F(2,105)		0.0873
F-statistic	8.074784	Prob. F(3,107)		0.0001

Men reduce the total invoice amount by 867.14₺/patient compared to female patients. The effect of age on total invoice costs is statistically insignificant (Prob> 0.05). Duration of hospitalization increases the total invoice amount by 483.69₺/day for an additional day of hospitalization (Table 7).

Of the 111 patients hospitalized for COPD exacerbation, 88 (79%) were male, and 23 (21%) were female. The mean age of males was 79 years. The mean age of all hospitalized patients was 70.19 years, with a maximum age of 90 and a minimum of 47 years. The average length of stay of all inpatients was 7.08 days. The total invoice amount of all patients was 303,618.70 ₺ ($18,345.54), of which the intervention amount was 117,656.30 ₺ ($7,109.14), medical equipment amount was 29,705.76 ₺ ($1,794.91), medication amount was 100,758.94 ₺ ($6,088.15) and examination amount was 55,497.69₺ ($3,353.33). The highest invoice amount per patient was 27,659.30₺/patient, and the lowest was 322.20₺/patient. The highest intervention amount is 21,019.56₺/patient; the lowest is 124.37₺/patient. The highest amount of medical equipment is 2.135,38₺/patient; the lowest is 11,83₺/patient. The drug amount is 5.169,59₺/patient; the lowest is 68,87₺/patient. The highest amount of examination was 3,371.86₺/patient, and the lowest was 8.21₺/patient (Table 8). The largest portion (40%) of the average invoice cost was intervention, and the lowest portion (10%) was medical equipment costs.

Table 8. Descriptive data of dependent and independent variables of inpatients with COPD

	Invoice amount	Intervention Amount	Medical Supplies Amount	Medicine Amount	Analysis and Inspection Amount	Gender	Age	Hospitalization Duration
Mean	2735.304	1059.967	267.6195	907.7383	499.9792	0.792793	70.19820	7.081081
Median	1834.007	644.5300	100.0000	571.2816	278.5400	1.000000	70.00000	6.000000
Maximum	27659.30	21019.56	2135.383	5169.590	3371.860	1.000000	90.00000	26.00000
Minimum	322.2011	124.3700	11.83300	68.87554	8.210000	0.000000	47.00000	1.000000
Std. Dev.	3160.675	2035.919	346.0912	994.9475	599.6833	0.407143	8.244910	5.288298
Skewness	4.901994	8.645481	2.332596	2.429160	2.672337	-1.444801	0.013539	1.615622
Kurtosis	36.51617	84.82004	10.24889	9.088780	11.51970	3.087451	3.083015	5.496536
Jarque-Bera	5639.965	32344.92	343.6859	280.6289	467.8223	38.65321	0.035264	77.11556
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.982522	0.000000
Sum	303618.7	117656.3	29705.76	100758.9	55497.69	88.00000	7792.000	786.0000
Sum Sq. Dev.	1.10E+09	4.56E+08	13175707	1.09E+08	39558208	18.23423	7477.640	3076.270
Observations	111	111	111	111	111	111	111	111
Total Cost (₺), ($)	303618.70 ($18,345.54)	117656.30 ($7,109.14)	29705.76 ($1,794.91)	100758.94 ($6,088.15)	55497.69 ($3,353.33)			

Out-of-hospital Medicine Expenses: One of the most essential items of direct costs of COPD patients in terms of SSI is drug costs. COPD is a chronic disease, and SSI covers the costs of medicines used continuously outside the hospital within the scope of SSI. Since the medicines used by COPD patients are within the scope of HPC-4/D, all of the costs of these medicines are covered by the SSI according to the "List of Medicines to be Paid for" HPC Annex-4/A for the year 2022.

According to the information obtained from patient epicrisis reports and prescriptions written to patients, COPD patients routinely use drugs such as Spiriva, Ipravent, and Forpack. Assuming all COPD drugs are used continuously by a patient annually, the average annual cost, according to HPC, is determined as 6,321.84₺ ($381.98) /patient.

DISCUSSION

In our study, The total cost of COPD disease in terms of SSI is determined as 9,184.90 ₺ ($554.98) /patient in addition to outpatient treatment costs of 127.76 ₺ ($7.72) /patient, inpatient treatment costs of 2,735.30 ₺ ($165.26) /patient and annual routine medication costs of 6,321.84 ₺ ($381.98). Studies on the cost of COPD in the literature are given in the table below (Table 9).

Table 9. Studies on the cost of COPD

Writers	Place and Period of Research	Number of patients (Sample)	Average Age	Hospitalization Duration (days)	Total cost
Our study	Turkiye X University Health Practice and Research Hospital Chest Diseases unit (1 January 2022- 31 December 2022)	Outpatient 130, inpatient 111, (198 male, 43 female)	Outpatient : 66,82 İnpatient: 70,19	7,08	Clinic total average treatment cost 2.319,64₺($140.16) Examination: 1.059, 97 ₺ ($64.05); Medical equipment: 267,62₺($16,17); Medicine: 907,74 ₺(54.85); Analysis and Inspection: 499.98 ₺($30.21) Annual outpatient medication: 6.321,84 ₺ ($381.98) Total annual average cost per patient: 9.184,90 ₺ ($554.98)
Hacıevliyagil vd., (2006)	Turkiye İnönü University Faculty of Medicine Chest Diseases Clinic (January 1 - April 30, 2005)	105	-	12.1	-Medicine: $312.74 - Bed Fees: $135.24 - Examination: $19.11 - Analysis and Inspection: $475.11 - Radiological Examination: $54.97 Total Cost: $997.18
Ozkaya vd., (2011)	Turkiye Samsun Chest Diseases and Thoracic Surgery Hospital (2005-2009)	7.832 (6.276 Male, 1.556 Female)	64,6±19,8	14.8±9.5	Costs by years 2005: $668, 2006: $765 2007: $768, 2008: $667 2009: $682
Geitona, Vd., (2011)	Greece Thrace Region Alexandroupolis University Training Hospital (2006-2007)	142	71.2	8.4	Total cost € 242.944 Average cost per patient € 1.711. Of this amount, €621 is repaid by social security funds.
Ornek vd. (2012)	Turkiye Zonguldak Karaelmas University Faculty of Medicine, Department of Chest Diseases (September 2010- August 2011)	284 (168 Male, 74 Female)	70.35 ± 10.65	11,38 ± 6,94	Average cost $889±533 - Lab $167±140 - consumables $56±73 - Medicines $245±212 - Clinic $422±262
Veettil vd., (2012)	India Government hospital in Kerala (January 2008-April 2008)	120	--	--	The average total cost calculated for the 7-day hospitalization period $89,75 (INR 4128.36/-)
Varol vd., (2013)	Turkiye Dr. Suat Seren Chest Diseases and Surgery Training and Research Hospital (2005-2006)	376 (311 Male, 65 Female)	65,31	9.86	Cost per patient: $1,368.54 - Medicine: $392.94 - Hospital Care: $949.20

Tanrıverdi (2013)	Turkiye Erzincan State Hospital Chest Diseases Clinic (January 1 - December 31, 2011)	236 (146 Male, 90 Female)	74±9	8.8±4.1	- Medicine Consumables: 390±313 ₺ ($233.53±$187.42) - Examination Treatment: 710±371 ₺ ($425.14±$222.15) Average total cost: 1.100±618 ₺ ($658.68±$370.05)
Çeldir Emre vd., (2014)	Turkiye Chest diseases clinic of a secondary care state hospital (September 2012 – February 2013)	241 (220 Male, 21 Female)	69.9±10.1	9.6±4.6	- Medicine: $255.25 - Bed Cost: $140.54 Total cost: $503.74
Özdemir vd., (2015)	Turkiye Çorum Chest Diseases Hospital (1 January 2009 – 31 December 2010)	4.193 (2009: 2046, 2010: 2147)	-	2009: 9.8 2010: 10.6	Cost per patient (2009): $762.80 (2010): $927.5
Yıldırım vd., (2015)	Turkiye Gazi University Faculty of Medicine Hospital Chest Diseases Clinic (1 September 2013 – 1 September 2014)	99 (77 Male, 22 Female)	70 (64-77)	8 (6-13)	Total cost per patient: 1.064 ₺ (726-1.866) ($485.84 ($331.50- $ 852.05); Medicine: 383 ₺ (134-689 ₺) ($174.88 ($61.18- $314.61); Bed Fee: 270 ₺ (180-450 ₺) ($123.28 ($82.19-$205.47); Examination: 230,1 ₺ (155,7-384,5 ₺) ($105.06 ($52.83-$175.57); Consumables and Other Expenses: 169,2 ₺ (94,9-332,2 ₺) ($77.26 ($43.33-$151.68)
Deniz vd., (2015)	Turkiye District State Hospital Chest Diseases Service (January 2013 - January 2014)	100 (69 Male, 31 Female)	73,7	7.8±6.1	Total cost: $554 - Antibiotic Cost: $95.99 - Medicine: $95.9
Deniz vd., (2016)	Turkiye All public hospitals in Aydın province (1 January 2014 – 31 December 2014)	3.095 (2.434 Male, 661 Female)	71,9 ± 10,5	8.1 ± 6.3	Average cost = $808.5±1,586 - hospitalizations: $325.1±879.9 - Medicines: $223.1±1,300.9 - Laboratory Expenses: $46.3±$49.6 - Other Expenses: $214±1,068
Mulpuru vd., (2017),	Canada An academic hospital in Canada (September 2010- September 2014)	1.894	73±12,6	5	Total cost for 4 years: $19.776.824 Average cost per case: $5.121 (IQR $2.853–10.731)
Baloch vd. (2018)	Pakistan Tertiary Care Ziauddin Hospitals in Karachi City (November 2016 - April 2017)	126	(41±95)	--	Total Direct Medical Costs (Rs.) Tip I: 430816.649 ($2,744) Tip II: 609104.2883 ($3,879) Tip III: 1339303.283 ($8.530) Average:$5.051
Peker (2019)	Turkiye A university intensive care unit (April 1, 2018 – January 1, 2019)	8 (4 Male, 4 Female)	71,2 (87±62)	20 (33±2)	Daily amount per patient: 1,233 ₺ ($255.28) Total Invoice Amount: 199.894 TL ($41,385.92)

According to the literature review, among the studies conducted on the treatment costs of COPD, Hacıevliyagil et al. (2006) calculated the total daily cost of 105 COPD patients hospitalized in a tertiary hospital as $997. It was determined that approximately 1/3 of this cost was drug expenses (14). Although the cost per patient in our study was less, it was seen that the drug expenses were approximately 1/3 in our study. In a study conducted by Ozkaya et al. (2011) in a 2-stage hospital, it was determined that the annual cost per patient (in 2009) was $668 (15). Geitona, et al. (2011) calculated the annual cost per patient as €1,711 in a study conducted in a public hospital in Greece (16). It was seen that the cost amount obtained was much higher than our study. Ornek et al. (2012) calculated the average annual cost per patient as $889±533 in a study conducted in a tertiary hospital in Zonguldak. It was observed that approximately 1/3 of this cost was drug expenses (17). This rate obtained is the same as our study. Veettil et al. (2012) calculated the cost per patient as $628 in a study conducted in a state hospital in India (18).

Varol et al. (2013) calculated the cost per patient in a second-level state hospital as $1,368. It was determined that 2/3 of this was patient care and 1/3 was medication expenses (19).Özdemir et al. (2015) calculated the cost per patient in a second-level state hospital in Çorum as $762 for 2009 and $927.5 for 2010 (20).Yıldırım et al. (2015) calculated the annual drug, bed and examination expenses per patient in a third-level state hospital as $1,064 (21).Deniz et al. (2016) calculated the annual average per patient as $1,197 in a study in second-level state hospitals in Aydın (22).Mulpuru et al. (2017) calculated the average annual cost of $5,121 in a public hospital in Canada (23).Baloch et al. (2018) calculated the average annual cost per patient in a public hospital in Pakistan as $7,338 (24). In the studies mentioned above and conducted in the literature, it was determined that the average cost per patient calculated was higher than the cost amount calculated in our study.

Tanrıverdi (2013) calculated the average cost as $514 in a second-level public hospital in Erzincan (25).Çeldir Emre et al. (2014) calculated the cost as $503 in their study. Approximately ½ of this was drug expenses (26).Peker (2019) calculated the cost as $255 per patient per day in a third-level public hospital (27). It has been observed that the costs calculated in these studies in the literature are less than the costs in our study. Deniz et al. (2015) calculated the cost per patient as $554 in the study conducted in a second-level state hospital (28). This calculated amount is the same as the cost of our study.

CONCLUSION

In the study, the cost of COPD was analyzed from the SSI perspective. In the analysis, were taken into invoice amounts calculated by DUHARH according to HPS prices, which include direct medical costs. The invoice amount consists of medicines, medical supplies, interventions and tests. In addition, the costs of medicines constantly used by COPD patients and covered by SSI were also included in the study.

Various costs must be incurred throughout life in the treatment and management of COPD, which is a chronic disease. To reduce these costs, it is important to increase the level of education and awareness among patients, healthcare professionals and the general public. In addition, factors that trigger the disease, such as smoking, air pollution and allergens in the home, should be eliminated.

In our study, drug costs were found to be high. The reason for this is that medicines are imported and priced based on exchange rate. In order to reduce drug costs, domestic production must be started. To reduce costs, more affordable pricing policies and expanded health insurance coverage for drugs and medical devices required for COPD treatment are required. In short, In order to reduce the cost of the disease, both necessary measures should be taken to reduce the risk of developing the disease, and lower-cost methods should be followed in the treatment of the disease. Smoking and air pollution are the most common causes of COPD. People with COPD are at higher risk of other health problems. COPD is not a curable disease, but symptoms can improve if people avoid smoking and exposure to air pollution and get vaccinated to prevent infections. It can also be treated with medications, oxygen, and pulmonary rehabilitation.

This study is limited to a tertiary care university hospital in Türkiye. Similar studies should be conducted in secondary care public and private hospitals throughout the country. Additionally, similar studies can be analyzed from different perspectives by considering the direct treatment costs incurred by SSI as well as the indirect non-medical costs.

Ethical Committee Approval: The research was approved by the Düzce University Graduate Education Institute Ethics Committee dated 20/10/2022 and numbered 2022/429, and Düzce University Health Application and Research Center permission letter dated 10/03/2023 and numbered 274375 and the permission letters of Düzce University Revolving Fund Management Directorate dated 16.03.2023 and numbered 276288.

Conflict of Interest: The authors of this case-analysis declare that they have no conflict of interest.

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RESEARCH ARTICLE

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Retrospective Analysis of Factors Affecting Mortality and Morbidity in Patients with Pressure Ulcers in the Palliative Care Unit

ABSTRACT

Objective: Pressure ulcers are conditions that result from the combination of multiple factors and have an impact on mortality and morbidity. In our study, the demographic data of patients, the majority of whom were elderly, along with the severity, stage, and etiological factors of pressure ulcers, were analyzed to assess their impact on mortality and morbidity.

Method: Our study is a cross-sectional and retrospective analysis. Data from 223 patients with pressure ulcers who were hospitalized in the Palliative Care Unit of Başakşehir Çam and Sakura City Hospital between April 1, 2021, and July 31, 2023, were reviewed. Patients' age, gender, length of stay, source of admission, discharge destination, nutritional status, laboratory values, and details related to pressure ulcers were recorded. The data obtained were analyzed using IBM SPSS version 25.0 (SPSS Inc., Chicago, IL, USA). A p-value of <0.05 was considered statistically significant.

Results: A statistically significant relationship was identified between the stage of the pressure ulcer and the number of pressure ulcers (p<0.001), as well as WBC (p=0.012), NEU (p=0.004), albumin (p<0.001), and prealbumin (p=0.008) values. Additionally, a statistically significant relationship was observed between the number of pressure ulcers and both the source of admission (p=0.034) and the discharge destination of the patients (p=0.017). A statistically significant difference was found between the source of admission and vitamin D levels (F=4.111, p=0.018). The discharge destination was also significantly associated with age (years) (F=5.786, p<0.001), the number of diseases (F=5.613, p<0.001), the number of medications used (F=6.217, p<0.001), and NRS2002 values (F=3.324, p=0.011).

Conclusions: In patients with pressure ulcers followed in the palliative care unit, advanced age, a higher number of pressure ulcers, the presence of infection, a history of intensive care unit stay, and low levels of albumin, prealbumin, and vitamin D are associated with increased mortality and morbidity.

Keywords: Pressure Ulcer, Holistic Medicine, Morbidity, Palliative Care.

Palyatif Bakım Servisinde Yatan Bası Yarası Mevcut Hastalarda Mortalite ve Morbidite Üzerine Etki Eden Faktörlerin Retrospektif Analizi

ÖZET

Amaç: Bası yaraları, birçok faktörün bir araya gelmesiyle oluşan ve mortalite ile morbidite üzerine etkili bir durumdur. Çalışmamızda, bası yarası olan çoğunluğu ileri yaş hastaların demografik verileri ile bası yarası şiddeti, evresi ve etiyolojide yer alan faktörlerin mortalite ve morbidite üzerine etkileri araştırılmıştır.

Yöntem: Çalışmamız kesitsel ve retrospektif tiptedir. Başakşehir Çam ve Sakura Şehir Hastanesi Palyatif Bakım Servisinde 01.04.2021-31.07.2023 tarihleri arasında yatarak tedavi gören ve bası yarası olan 223 hastanın verileri taranmıştır. Hastaların yaş, cinsiyet, yatış süresi, nakil alındığı yer bilgisi, taburcu edilen yer bilgisi, nutrisyon durumu, laboratuvar değerleri ve bası yarası ile ilgili bilgileri kaydedilmiştir. Elde edilen veriler IBM SPSS sürüm 25.0 (SPSS Inc., Chicago, Illinois, ABD) programı ile analiz edilmiştir. İstatistiksel analizlerde p<0.05 değeri anlamlı kabul edilmiştir.

Bulgular: Hastalarda mevcut olan bası yarası evresi ile bası yarası sayısı arasında(p<0.001), WBC (p=0.012), NEU (p=0.004), albümin (p<0.001), prealbumin (p=0.008) değerleri arasında istatiksel anlamlı ilişki bulunmuştur. Bası yarası sayısı ile hastanın alındığı yer (p=0.034) ve hastanın taburcu edildiği yer arasında (p=0.017) istatistiksel olarak anlamlı bir ilişki saptanmıştır. Hastanın alındığı yer ile D vitamini düzeyleri arasında istatistiksel olarak anlamlı bir fark saptanmıştır (F=4.111, p=0.018). Hastaların taburcu edildiği yer ile yaş (yıl) (F=5.786, p<0.001), hastalık sayısı (F=5.613, p<0.001), kullanılan ilaç sayısı (F=6.217, p<0.001) ve NRS2002 değerleri (F=3.324, p=0.011) arasında arasında istatistiksel olarak anlamlı bir ilişki saptanmıştır.

Sonuç: Palyatif bakım servisinde takip edilen bası yarası mevcut hastalarda, ileri yaş, bası yarası sayısının fazla olması, enfeksiyon, yoğun bakım yatışı öyküsü, albümin, prealbumin ve D vitamini düşüklüğü mortalite ve morbidite ile ilişkilidir.

Anahtar Kelimeler: Bası Yarası, Bütüncül Tıp, Morbidite, Palyatif Bakım.

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INTRODUCTION

The European Pressure Ulcer Advisory Panel (EPUAP) defines a pressure ulcer as "localized damage to the skin and/or underlying tissue, usually over a bony prominence, resulting from sustained pressure or pressure in combination with shear forces"(1). Pressure is the most critical factor in the development of pressure ulcers. Conditions that increase pressure on tissues or reduce tissue sensitivity to pressure accelerate the formation of pressure ulcers (2). Particularly in the elderly population, neurological diseases, spinal cord injuries, cerebrovascular events, and prolonged surgical procedures significantly contribute to pressure ulcer development due to their association with immobility (3,4). Infections, inflammation, friction, moisture, shear forces during transfers, poor general health, advanced age, malnutrition, anemia, edema, and diabetes are also recognized as factors that facilitate the development of pressure ulcers (4,5).

Palliative care and pressure ulcer management require a highly specialized team. With the aging population, the demand for palliative care services is increasing, and pressure ulcers remain a significant concern for these patients(3). Identifying risk factors and implementing preventive measures are more cost-effective than treatment. The costs associated with managing severe pressure ulcers are substantially higher than those of preventive strategies (6).

Pressure ulcers are a major cause of mortality and morbidity among elderly patients. However, there are limited studies focusing on palliative care patients, and statistical data on pressure ulcers in our country remain scarce. This study aims to analyze the demographic characteristics of patients with pressure ulcers, investigate the factors influencing the development of pressure ulcers, and evaluate the effects of these factors on mortality and morbidity.

MATERIAL AND METHODS

This study is a retrospective cross-sectional analysis. Data from patients with pressure ulcers who were hospitalized in the Palliative Care Unit of Başakşehir Çam and Sakura City Hospital between April 1, 2021, and July 31, 2023, were reviewed retrospectively. The study included 223 patients with pressure ulcers. Patients' demographic characteristics, primary diagnoses, comorbidities, number and stages of pressure ulcers, length of hospital stay, discharge or transfer destinations, number of medications used, source of admission, nutritional risk score (NRS-2002), and biochemical test results were examined through the hospital system and nursing records. The relationships between these variables were analyzed. For patients with multiple pressure ulcers, the most severe stage of the pressure ulcer was considered for analysis.

Biochemical tests included hemoglobin (HGB), hematocrit (HCT), white blood cell count (WBC), neutrophil count (NEU), neutrophil-to-lymphocyte ratio (NLR), total protein, C-reactive protein (CRP), vitamin D, albumin, and prealbumin levels.

Ethics committee approval for the study was obtained from the Ethics Committee of Başakşehir Çam and Sakura City Hospital on October 2, 2023, with the decision number 225627113.

Statistical Analysis: All analyses were performed using IBM SPSS version 25.0 (SPSS Inc., Chicago, Illinois, USA). Continuous variables were presented as median (min-max) and mean ± SD, while categorical variables were expressed as number (n) and percentage (%). Pearson correlation test was applied for correlation analysis, and Chi-Square test was used for categorical variables. Independent Samples t-test and One-Way ANOVA were used for comparing means, with Sidak test as the post-hoc test. A p-value of <0.05 was considered statistically significant.

RESULTS

The mean age of the 223 patients included in the study was 68.88±16.25 years (min=18, max=97), with 66.4% (n=148) being 65 years or older and 33.6% (n=75) being under 65 years. Of the patients, 48.0% (n=107) were admitted from the ward, 27.8% (n=62) from the intensive care unit (ICU), and 24.2% (n=54) from home. Among these patients, 61.9% (n=138) were discharged to home, 25.6% (n=57) were transferred back to the ICU, 3.6% (n=8) were transferred to other wards, and 3.6% (n=8) were transferred to the physical therapy and rehabilitation (PTR) unit. Mortality (exitus) occurred in 5.4% (n=12) of the patients.

The frequency distribution of demographic and various variables related to the patients is shown in Table 1.

Table 1. Frequency distribution of demographic and various variables of patients (n=223)

Variables	n or Median (Min-Max)
Gender	
Female	103
Male	120
Primary disease	
Trauma	39
Infection	21
Malignancy	43
Neurological	93
Other	27
NRS2002	2.0 (0.0-6.0)
Number of diseases	2.0 (0.0-8.0)
Number of medications used	4.0 (0.0-10.0)

n=Number, Median=Median, Min=Minimum, Max=Maximum

The most common pressure ulcer stage observed among patients was Stage 2, comprising 26.5% (n=59) of cases, followed by unstageable ulcers at 22% (n=49), Stage 1 at 15.7% (n=35), Stage 3 at 14.3% (n=32), Stage 4 at 13.5% (n=30), and suspected deep tissue injuries at 8.1% (n=18). The average number of pressure ulcers per patient was 2.34 ± 1.81 (min: 1, max: 13).

A statistically significant difference was found between the pressure ulcer stages and the number of pressure ulcers (F=29.478, p<0.001). According to the results of the post-hoc analysis, Stage 1 pressure ulcers had significantly lower mean numbers of pressure ulcers compared to Stage 4, Suspected Deep Tissue Injury, and Unstageable Stage (p<0.001). Similarly, Stage 2 and Stage 3 pressure ulcers also exhibited significantly lower mean numbers compared to Suspected Deep Tissue Injury and Unstageable Stage. The highest average number of pressure ulcers was observed in the Unstageable Stage group (4.10±2.16), while the lowest average was in Stage 1 ulcers (1.03±0.17).

Table 2 shows the relationship between pressure ulcer stages and the number of pressure ulcers in patients.

When the pressure ulcer stages of the patients were compared with laboratory parameters, statistically significant differences were observed between the highest pressure ulcer stage and WBC values (F=2.990, p=0.012), NEU values (F=3.520, p=0.004), albumin levels (F=5.871, p<0.001), and prealbumin levels (F=3.247, p=0.008). Patients with Stage 1 pressure ulcers had higher albumin and prealbumin levels compared to other groups, while their WBC and NEU values were found to be lower than those in the other groups.

Table 2. Relationship between pressure ulcer stages and the number of pressure ulcers in Patients (n=223)

Variables	**n**	**Mean±SD**	**p**
Number of Pressure Ulcers			**<0.001**
Stage 1	35	1.03±0.17	
Stage 2	59	1.54±0.92	
Stage 3	32	1.78±1.10	
Stage 4	30	2.33±1.58	
Suspected Deep Tissue Injury	18	3.78±1.77	
Unstageable	49	4.10±2.16	

t=Independent Samples t-test, p<0.05

Table 3 shows the laboratory parameters that were found to be statistically significant with pressure ulcer stages in patients.

Table 3. Comparison of blood parameters by pressure ulcer stages in participants (n=223)

Variables	**Stage 1 (n=35)**	**Stage 2 (n=59)**	**Stage 3 (n=32)**	**Stage 4 (n=30)**	**Suspected Deep Tissue Injury (n=18)**	**Unstageable (n=49)**	**p**
WBC (x10^3/µL)	7.87 ± 2.85	8.88 ± 3.85	8.63 ± 3.17	8.95 ± 3.3	9.62 ± 2.7	10.82 ± 4.95	0.012
NEU (x10^3/µL)	5.68 ± 2.55	6.68 ± 3.76	5.72 ± 2.89	6.10 ± 2.75	6.98 ± 2.53	8.36 ± 4.59	0.004
Albumin (g/L)	3.16 ± 0.53	3.02 ± 0.49	2.99 ± 0.66	2.61 ± 0.42	3.11 ± 0.42	2.72 ± 0.58	<0.001
Prealbumin (mg/dL)	14.80 ± 6.16	12.78 ± 5.9	14.03 ± 6.11	10.57 ± 4.56	13.11 ± 5.70	10.55 ± 6.36	0.008

t = Independent Samples t test, p<0.05

A statistically significant difference was found between the number of pressure ulcers and the source of admission (F=3.424, p=0.034) as well as the discharge destination (F=3.069, p=0.017). Patients admitted from or discharged to the intensive care unit (ICU) had a higher number of pressure ulcers compared to other groups.

A statistically significant difference was found between the source of admission and vitamin D levels (F=4.111, p=0.018). Patients admitted from home had the highest vitamin D levels (14.39±10.38 ng/mL) compared to other groups. According to the Sidak post-hoc analysis, a statistically significant difference was observed between patients admitted from home and those transferred from the ICU (p=0.014). The lowest vitamin D levels were found in patients admitted from the ICU, with an average of 9.79±6.89 ng/mL.

Statistically significant differences were observed between discharge destinations and age (years) (F=5.786, p<0.001), the number of diseases (F=5.613, p<0.001), the number of medications used (F=6.217, p<0.001), and NRS2002 scores (F=3.324, p=0.011) when comparing the discharge destinations of patients with demographic data.

Table 4 shows the comparison of patients' discharge destinations with their demographic data.

Table 4. Comparison of Various Variables by Discharge Destinations of Patients (n=223)

Variables	ICU (n=57)	Exitus (n=12)	Discharged home (n=138)	To anaother war (n=8)	PTR (n=8)	p
Age (years)	70.81 ± 15.76	72.00 ± 10.95	69.78 ± 15.36	58.50 ± 23.42	45.63 ± 15.12	<0.001
Number of Diseases	2.60 ± 1.50	2.42 ± 1.93	2.63 ± 1.41	1.25 ± 1.28	0.50 ± 1.07	<0.001
Number of medications used	3.93 ± 2.24	3.00 ± 2.63	3.92 ± 2.21	1.25 ± 1.28	1.00 ± 1.93	<0.001
NRS2002	2.28 ± 1.53	2.75 ± 1.91	1.75 ± 1.37	1.88 ± 1.96	0.88 ± 1.13	0.011

Of the patients under 65 years old, 87.5% (n=7) were transferred to the physical therapy and rehabilitation (PTR) unit, while 75.4% (n=43) of patients aged 65 and older were transferred to the ICU. Among the patients transferred to the ICU (n=57), 45.6% (n=26) were those who were initially admitted to the palliative care unit from the ICU.

When the relationship between discharge destinations and blood parameters of patients was examined, statistically significant differences were observed in NEU (F=3.875, p=0.005), NLR (F=9.844, p<0.001), total protein (F=7.733, p<0.001), albumin (F=8.316, p<0.001), prealbumin (F=6.039, p<0.001), and vitamin D (F=2.902, p=0.023) levels.

Table 5 presents the blood parameters that showed significant differences based on the discharge destinations of the patients.

Table 5. Comparison of various laboratory variables by discharge destination in patients (n=223)

Variables	ICU (n=57)	Exitus (n=12)	Discharged home (n=138)	To another ward (n=8)	PTR (n=8)	p
NEU (x10^3/µL)	7.77 ± 3.73	9.04 ± 5.60	6.13 ± 3.19	5.43 ± 2.26	6.61 ± 4.00	0.005
NLR	7.49 ± 5.86	15.68 ± 19.58	4.58 ± 4.50	4.01 ± 2.21	3.23 ± 1.72	<0.001
Total Protein (g/L)	57.40 ± 9.30	51.50 ± 7.13	61.38 ± 7.34	62.38 ± 7.15	66.63 ± 6.57	<0.001
Albumin (g/L)	2.67 ± 0.53	2.50 ± 0.57	3.04 ± 0.52	2.98 ± 0.50	3.39 ± 0.50	<0.001
Prealbumin (mg/dL)	11.02 ± 6.14	8.17 ± 4.93	13.07 ± 5.65	12.63 ± 6.72	19.75 ± 6.27	<0.001
Vitamin D (ng/mL)	9.32 ± 7.40	8.42 ± 4.23	13.29 ± 9.50	11.38 ± 5.80	14.75 ± 6.04	0.023

t = Independent Samples t-test, p<0.05

When examining the Pearson correlation analysis of the relationships between patients' demographic and blood parameters, a statistically significant positive correlation was found between the number of pressure ulcers and WBC values (r=0.328, p<0.001), NEU values (r=0.331, p<0.001), and CRP values (r=0.239, p<0.001).

DISCUSSION

In our study, the relationships between pressure ulcer stages, the number of pressure ulcers, and various clinical and laboratory parameters were examined. A positive correlation was found between the number of pressure ulcers and WBC, NEU, and CRP values. These values were highest in unstageable pressure ulcers. Patients with low vitamin D levels were found to have higher morbidity and mortality rates. Additionally, hypoalbuminemia and low prealbumin levels showed a negative correlation with the pressure ulcer stage, revealing the significant impact of malnutrition on mortality and morbidity.

The literature lacks sufficient studies on parameters such as CRP, procalcitonin, WBC, NEU, and NLR. Kurtoğlu et al. observed a significant increase in CRP values as the pressure ulcer stage progressed(7). Although our study did not find a correlation between CRP and pressure ulcer stages, an increase in CRP values was observed as the number of pressure ulcers increased. WBC and NEU values were related to the pressure ulcer stage and were highest in unstageable pressure ulcers. Similarly, NEU levels were highest in patients who experienced exitus and those transferred to the ICU. Although not statistically significant, a similar trend was observed for WBC and CRP levels. NLR values were higher in patients who experienced exitus compared to other groups, followed by those transferred to the ICU. These findings suggest that these parameters may influence both mortality and morbidity.

Studies investigating the relationship between vitamin D and pressure ulcers are limited. In a case-control study by Kalava et al., the authors suggested that more robust analyses with sufficient statistical power could demonstrate a relationship between vitamin D and pressure ulcers (8). In our study, vitamin D levels were found to be lowest in patients who experienced exitus, followed by those transferred to the ICU. Patients admitted from the ICU had lower vitamin D levels compared to those admitted from home or other wards. These findings suggest that vitamin D may affect morbidity and mortality in patients with pressure ulcers, contributing valuable insights to the literature.

The literature indicates that patients with a history of ICU stay are at a higher risk of developing pressure ulcers (9,10). Similarly, in our study, patients admitted from and transferred to the ICU had the highest number of pressure ulcers. Moreover, most patients transferred to the ICU were originally admitted from the ICU. This highlights the significant impact of ICU admission history and the higher number of pressure ulcers on mortality and morbidity.

Advanced age has been identified as a major risk factor for pressure ulcer development in many studies (11,12). In our study, the predominance of patients aged 65 and older, as well as the higher average age of those transferred to the ICU or who experienced exitus, aligns with the existing literature.

As in Kıraner's study, our research also identified Stage 2 pressure ulcers as the most common among patients (13).

When the literature on nutritional parameters is examined, studies have identified hypoalbuminemia as a risk factor for wound development (14,15). In our study, albumin and prealbumin levels decreased as the pressure ulcer stage progressed and were lowest in patients who experienced exitus. These findings support the impact of albumin and prealbumin on both pressure ulcer development and mortality and morbidity. The limited literature on prealbumin makes its detailed evaluation in our study particularly valuable.

Finally, according to the NRS 2002 nutrition score, patients at risk of malnutrition are more likely to develop pressure ulcers (16,17). In our study, patients who experienced exitus had higher NRS 2002 scores, indicating severe malnutrition, followed by those transferred to the ICU. This underscores the role of nutrition and malnutrition in influencing mortality and morbidity in patients with pressure ulcers.

CONCLUSION

Pressure ulcers are largely preventable, making them a significant quality indicator for all healthcare institutions. Various factors contribute to the formation and progression of pressure ulcers, and these factors also affect mortality and morbidity in patients with pressure ulcers. Our study demonstrated that several factors influence mortality and morbidity in patients with pressure ulcers. These factors include advanced age, advanced stage pressure ulcers, the presence of multiple pressure ulcers, the number of comorbidities and medications, a history of ICU stay, vitamin D deficiency, nutritional disorders or malnutrition, and the presence of infection and inflammation.

It is crucial to thoroughly assess all risks and conduct a risk analysis when patients are admitted to palliative care. In addition to taking necessary physical precautions, addressing biochemical deficiencies, managing nutrition to prevent albumin and prealbumin deficiencies, and controlling existing infections are important to prevent the formation or progression of pressure ulcers. Such measures are expected to reduce the mortality and morbidity rates in patients.

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RESEARCH ARTICLE

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Knowledge, Attitudes and Perspectives on Monkeypox Disease and Vaccination

ABSTRACT

Objective: This study aims to examine the knowledge, attitudes, and perspectives toward vaccination related to monkeypox (Mpox) disease, which is defined as an urgent public health crisis by the World Health Organization (WHO), in both healthcare workers and other segments of society to raise awareness.
Method: This is a cross-sectional study conducted between 01.10.2024 and 01.11.2024 with 684 participants residing in Karabük province. A 27-question survey was used to collect data on sociodemographic characteristics, as well as knowledge and attitudes about Mpox disease. The participants demographic characteristics were presented as frequency and percentage. Chi-square analysis was used to assess categorical data, with a significance level of $p \leq 0.05$.
Results: The average age of the participants was 31.98. Significant differences were found in terms of age, marital status, and employment status regarding knowledge of the approved Mpox vaccine and the intention to get vaccinated. The internet was the most common source of information about Mpox. 44.9% of participants expressed concern about Mpox, with women being significantly more concerned than men.
Conclusions: The knowledge, attitude, and participation of all segments of society are crucial in the fight against infectious diseases. Preparing for Mpox, which poses a significant global risk, and raising public awareness will contribute to public health. It was emphasized that online sources are the main source of information, and measures to mitigate the negative effects of infodemics were thought to be beneficial.
Keywords: Monkeypox, Knowledge, Vaccination.

Maymun Çiçeği Hastalığı Hakkındaki Bilgi, Tutum ve Aşılamaya Yönelik Bakış Açıları

ÖZET

Amaç: Bu çalışmanın amacı hem sağlık çalışanları hem de toplumun diğer kesiminde Dünya Sağlık Örgütü (DSÖ) tarafından acil halk sağlığı krizi olarak tanımlanan maymun çiçeği (Mpox) hastalığına farkındalık yaratmak için bilgi, tutum ve aşıya yönelik bakış açılarını incelemektir.
Yöntem: Bu çalışma kesitsel bir çalışmadır. 01.10.2024-01.11.2024 tarihleri arasında Karabük ilinde ikamet eden 684 kişinin katılımı ile çalışma yürütüldü. Verilerin toplanması için sosyodemografik özellikler ile Mpox hastalığı hakkında bilgi ve tutumun sorgulandığı 27 soruluk anket formu kullanıldı. Kişilerin tanıtıcı özelikleri, frekans ve yüzde ile ifade edilmiştir. Kategorik verilerin değerlendirilmesindeki-kare analizi uygulanmıştır. İstatistiksel analizlerde anlamlılık düzeyi $p \leq 0.05$ olarak kabul edildi.
Bulgular: Katılımcıların yaş ortalaması 31.98 yıldı. Çalışmada Mpox onaylı aşısı olduğunu bilme durumu ile Mpox aşısını yaptırma düşüncesine baktığımızda yaş, medeni durum ve çalışma durumuna göre anlamlı farklılıklar bulunmuştur. Mpox hastalığı hakkında en fazla bilgi edinme yerinin internet olduğu görülmüştür. Katılımcıların %44.9'u Mpox'tan endişelendiğini ifade etmiştir. Kadınlar erkeklerden anlamlı düzeyde daha fazla endişelenmektedir.
Sonuç: Bulaşıcı hastalıklar ile mücadelede halkın her kesimin bilgisi, tutumu ve katılımı son derece önem arz etmektedir. Son dönemlerde dünya geneli için büyük risk oluşturan Mpox için hazırlıkların yapılması ve toplumun bilinçlendirilmesi halk sağlığına katkıda bulunacaktır. Bu konuda günümüzde bilgi ediniminin en çok olduğu yerin çevrimiçi kaynaklar olduğuna dikkat çekilerek infodeminin olumsuz etkilerinin önüne geçmek için alınacak önlemlerin fayda sağlayacağı düşünülmüştür.
Anahtar Kelimeler: Maymun Çiçeği, Bilgi, Aşılama.

INTRODUCTION

Monkeypox (Mpox) disease is a viral disease caused by Mpox virus, a member of the genus Orthopoxvirus in the poxviridae family (1). It is a zoonotic disease with an undefined primary host and pathogenic in animals and humans (2). It is known that smallpox caused by Variola virus (Smallpox), with which it is closely related, was eradicated from the world in 1980 with vaccination studies (1, 3).

Mpox was first detected in 1958 in an outbreak in non-human primates kept in a laboratory in Denmark (4, 5). The first human case was reported in 1970 after detailed epidemiologic studies in a 9-month-old child living in the Democratic Republic of Congo whose clinical symptoms were similar to smallpox (6). Although the natural reservoirs of Mpox are not known for certain, it is thought to be small mammals such as squirrels, rodents and Gambian possums (7).

The virus has two different classes. After smallpox was eradicated, Mpox continued to occur sporadically in Central and East Africa in clade I (subclades Ia and Ib) and in West Africa in clade II (subclades IIa and IIb) (8). Clade I is known to be more contagious, clinically more severe and fatal (7). The first outbreak of Mpox outside Africa was observed in 2003 in the USA due to animals imported from Africa (5). In the following years, it continued to be endemic in Africa, with hundreds of cases reported each year. By May 2022, it was first reported in the United Kingdom and new cases were seen in 110 countries around the world, with European and American countries in the center (9, 10).

Mpox can be transmitted from animals to humans by contact with blood and other body fluids of infected animals, skin and mucosal lesions, consumption of raw or undercooked infected animals, scratches and bites of infected animals (11). Human-to-human transmission can occur through respiratory droplets, close sexual contact, skin contact with a person with Mpox rash, wounds or scabs, contact with contaminated fabrics, objects or surfaces (such as clothing, bedding or towels), vertical transmission from mother to newborn (12, 13).

Common early symptoms of Mpox virus infection include pain, fever, fatigue and lymphadenopathy(14). After fever and lymphadenopathy, rashes begin to appear on the head and face and gradually spread throughout the body. The rashes may vary from macules to papules, vesicles to pustules. The skin rash usually lasts 2-3 weeks (15). The rash heals by forming a crust, leaving behind a scar. The average incubation period is usually 7-10 days after exposure(16). Children, the elderly and immunocompromised people are more prone to experience symptoms that cause the disease to be more severe (9).

Since the signs and symptoms of Mpox are similar to other diseases, the diagnosis may not be easy. Many diseases such as smallpox, varicella, measles, bacterial skin infections, sexually transmitted infections, allergic skin reactions should be kept in mind in the differential diagnosis (17). The best and definitive diagnostic method is demonstration of viral DNA by polymerase chain reaction performed on a swab taken from skin lesions. If there is no skin lesion, swabs can also be taken from other mucosal areas. Although it does not lead to a definite diagnosis, laboratory techniques such as ELISA, electron microscopy, immunofluorescent antibody tests and virus isolation may also help in the diagnosis (18). There is no specific treatment for Mpox. In most patients, the main approach in treatment is symptomatic and supportive treatment (19).

There is a vaccine for Mpox and vaccination should be considered together with other public health preventive measures. The control and prevention of Mpox depends on increasing social awareness, effective operation of public health interventions and training of healthcare workers on measures to prevent the spread of infection (8). Therefore, in this article, we discussed the knowledge, attitudes and vaccination perspectives of both healthcare workers and other segments of the society towards Mpox.

MATERIAL AND METHODS

Type and Purpose of the Study: This study is a cross-sectional study. The study was conducted to raise awareness about Mpox disease, which is defined as an urgent public health crisis by World Health Organization (WHO) (8).

Place and Time of the Study: Between October 1, 2024 and November 1, 2024, it was conducted online in Karabük province.

Population and Sample of the Study: The population of the study consisted of people residing in Karabük province. As a result of the sample size analysis, the smallest sample size to be reached to ensure 80% power and 95% confidence interval was 425 people. The questionnaire was administered to people who could read and complete it independently. Fourteen people who left the questionnaire unfinished and four people under the age of 18 were excluded from the study. The study was completed with a total of 684 participants, a number above the adequate sample size.

Data Collection: A web-based online survey platform was used to reach the participants and create the questionnaire. Participants were invited through links on various social media platforms such as WhatsApp, Instagram, Twitter, Facebook. This method was preferred because it is fast and efficient. Since there was a wide range of responses to the employment status question, the answers were categorized.

Participants were informed about the subject, content and purpose of the study. The questionnaire was administered on a completely voluntary basis to the people involved in the study. Responses were guaranteed to remain confidential. It was made clear to the participants that they could withdraw from the survey at any time without explaining the reasons for withdrawal and that there would be no consequences for withdrawal.

Data Collection Tools: The questionnaire was designed and developed after a comprehensive search in the literature. The questionnaire consists of 27 questions in total. In the first section, various sociodemographic characteristics of the participants such as age, gender, occupation, income, education level, and place of residence were questioned. The second and third sections consisted of questions about their knowledge and attitudes about Mpox.

Data Analysis: The data obtained in this study were analyzed using the SPSS package program. The descriptive characteristics of the participants were expressed as frequencies and percentages. Chi-square analysis was applied in the evaluation of categorical data. The significance level was accepted as $p \leq 0.05$ when interpreting the results.

Ethics Committee Approval: Approval for the study was obtained from the Non-Interventional Ethics Committee of Karabük University Faculty of Medicine**.**

RESULTS

The mean age of the participants was 31.98 years (SD=12.833) and 55.1% were between 18-30 years old. 57.0% of the participants were female and 55.1% were single. In the study, 71.1% of the participants had a bachelor's degree and 73.5% of them had an income equal to their expenses (Table 1).

Table 1. Sociodemographic Characteristics

		n	%
Gender	Male	294	43,0
	Female	390	57.0
Age	18-30	377	55.1
	30-50	239	34.9
	50-80	68	9.9
Residence	District	92	13.5
	Village	18	2.6
	Province	574	83.9
Marital Status	Single	377	55.1
	Married	307	44.9
Level of Education	Primary-High School	98	14.3
	Undergraduate	486	71.1
	Graduate	100	14.6
Employment Status	Health Worker	93	13.6
	University Student	277	40.5
	Other	314	45.9
Economic Status	Income Exceeds Expenses	141	20.6
	Income Equals Expenses	503	73.5
	Income Less than Expenses	40	5.8

When the participants were asked about the symptoms of Mpox, 78.9% said they knew fever, 75% rash, 45.5% headache, 43.6% fatigue, 41.2% myalgia, 36.4% LAP, 26.2% cough, 22.1% diarrhea-vomiting, 16.7% eye problems.

Among the transmission routes of Mpox, 74.7% of the participants knew that it was transmitted by contact with rash, 45.3% by contaminated objects, 45.5% by droplet, 35.4% by sexual contact, 28.4% by animal bite, and 14.8% by placenta.

When asked about their thoughts on the outbreak of Mpox, 32.9% of the participants said that it was an epidemic that could be like other epidemics that occurred throughout human history, 15.5% said that it was a disease that had already existed for years, 13.6% said that it was created for biological warfare, 12.6% said that vaccine and pharmaceutical companies created it to make money, 11.5% said it was a project to reduce the world's population, 8.2% said it was transmitted to humans through the consumption of various animals, 4.5% said it was leaked from a laboratory where viruses were experimented on, and 1.2% thought it might have been created by the Creator to punish humanity.

18.9% of the participants knew that there was an approved vaccine for Mpox and the majority of those who knew were in the 18-30 age group. According to study status, the majority of those who knew that there was an approved vaccine for Mpox were university students, while in terms of marital status, the majority were single participants. In the comparison between the groups, significant differences were found in terms of age, marital status ($p<0.001$) and employment status ($p=0.002$) (Table 2). No significant differences were found in the statistical analysis according to gender, place of residence, educational level and economic status.

Only 19.2% of the people in the study had the intention to be vaccinated against Mpox and the majority were in the 18-30 age group. The majority of those who were considering Mpox vaccination were university students and single participants. In the analysis, significant differences were found in terms of age, marital status and employment status groups ($p<0.001$) (Table 2). There were no differences according to gender, place of residence, educational level and economic status.

Among the participants in the study, 61.2% stated that they did not want to be vaccinated because they were afraid of the complications of the vaccine, 33.6% stated that the vaccines were not sufficiently tested and 5.2% stated that they did not want to be vaccinated because they thought that the vaccines were ineffective.

Table 2. Knowledge of Mpox Approved Vaccine and Consideration of Vaccination Against Mpox According to Age, Marital Status, Occupational Characteristics

			Age				Marital status			Working Status			
			18-30	30-50	50-80	Total	Single	Married	Total	Health Worker	University Student	Other	Total
Total		n	377	239	68	684	377	307	684	93	277	314	684
		%	55.1	34.9	9.9	100	55.1	44.9	100	13.6	40.5	45.9	100
Is there an approved vaccine for Mpox?	exist	n	90_a	28_b	$11_{a, b}$	129	90	39	129	$18_{a, b}$	69_b	42_a	129
		%	13.2	4.1	1.6	18.9	13.2	5.7	18.9	2.6	10.1	6.1	18.9
	absent	n	287_a	211_b	$57_{a, b}$	555	287	268	555	$75_{a, b}$	208_b	272_a	555
		%	42.0	30.8	8.3	81.1	42.0	39.2	81.1	11.0	30.4	39.8	81.1
X² testi			p value: <0.001				p value: <0.001			p value =0.002			
Are you considering getting vaccinated against Mpox?	yes	n	106_a	19_b	6_b	131	101	30	131	23_a	75_a	33_b	131
		%	15.5	2.8	0.9	19.2	14.8	4.4	19.2	3.4	11.0	4.8	19.2
	no	n	153_a	188_b	52_b	393	160	233	393	44_a	111_a	238_b	393
		%	22.4	27.5	7.6	57.5	23.4	34.1	57.5	6.4	16.2	34.8	57.5
	undecided	n	118_a	32_b	10_b	160	116	44	160	26_a	91_a	43_b	160
		%	17.3	4.7	1.5	23.4	17.0	6.4	23.4	3.8	13.3	6.3	23.4
Pearson Chi-Square Testi			p değeri: <0.001				p değeri: <0.001			p değeri: <0.001			

a,b: the difference between the groups that do not have the same letter in each line is significant. (p<0.05)

The most common source of information about Mpox was the internet (62.7%), and this rate was higher among the 18-30 age group (41.7%), singles (41.5%) and university students (31.0%). In the analyses, there was a significant difference between the sources of information and age group, marital status and employment status (p <0.001) (Table 3). No significant difference was found in the statistical analysis conducted according to gender, place of residence, education level and economic status.

While 44.9% of the participants stated that they were worried about Mpox news, this rate was higher among women (29.1%) and those whose economic status was equal to their income (p<0.001, p=0.017, respectively) (Table 4).

Table 3. Where Mpox was learned according to age, marital status, and profession characteristics

		Age				Marital status			Working Status			
		18-30	30-50	50-80	Total	Single	Married	Total	Health Worker	University Student	Other	Total
Total	n	377	239	68	684	377	307	684	93	277	314	684
	%	55.1	34.9	9.9	100.0	55.1	44.9	100.0	13.6	40.5	45.9	100.0
People Around	n	38_a	5_b	$2_{a, b}$	45	37	8	45	8_a	30_a	7_b	45
	%	5.6	0.7	0.3	6.6%	5.4	1.2	6.6	1.2	4.4	1.0	6.6
Internet	n	285_a	123_b	21_c	429	284	145	429	57_a	212_b	160_a	429
	%	41.7	18.0	3.1	62.7	41.5	21.2	62.7	8.3	31.0	23.4	62.7
Television	n	54_a	111_b	45_c	210	56	154	210	28_a	35_b	147_c	210
	%	7.9	16.2	6.6	30.7	8.2	22.5	30.7	4.1	5.1	21.5	30.7
Pearson Chi-Square Testi		p değeri: <0.001				p değeri: <0.001			p değeri: <0.001			

a,b,c: the difference between the groups that do not have the same letter in each line is significant. (p<0.05)

Table 4. Mpox concerns according to gender and economic status characteristics

			Are you worried about Mpox?			Total	p vakue
			Yes	No	Undecided		
Total		n	307	269	108	684	
		%	44.9	39.3	15.8	100.0	
Gender	male	n	108	147	39	294	p<0.001
		%	15.8	21.5	5.7	43.0	
	female	n	199	122	69	390	
		%	29.1	17.8	10.1	57.0	
Economic status	Income exceeds expenses	n	46_a	71_b	$24_{a,b}$	141	p=0.017
		%	6.7	10.4	3.5	20.6	
	Income equals Expenses	n	240_a	184_b	$79_{a,b}$	503	
		%	35.1	26.9	11.5	73.5	
	Income less than expenses	n	21_a	14_a	5_a	40	
		%	3.1	2.0	0.7	5.8	

a,b: the difference between the groups that do not have the same letter in each line is significant. (p<0.05)

DISCUSSION

In this study, we found that most of the participants were concerned about Mpox disease. Most of those who were concerned were women and those whose economic status was equal to their income. Similarly, in the study conducted by Wang et al. in China, most of those who were concerned were women, but there was no relationship with economic status (20). This may have resulted from the difference in the socioeconomic status of the groups in which the studies were conducted. In another study conducted in Saudi Arabia, 37.4% of the general population were more concerned about Mpox than COVID-19 (21). On the other hand, in the studies conducted by Meo and Wang, the majority of participants were not concerned about Mpox (22, 23). These differences may vary depending on how countries were affected by the outbreak during the COVID-19 pandemic, how they managed the outbreak, and their preparedness in case of any new outbreak.

In the survey, 57.5% of the participants stated that they would not get vaccinated against Mpox. This situation may have resulted from the possible complications of vaccines, the idea that vaccines are put on the market without sufficient testing, the discourses in the media about anti-vaccination, and the prejudice that vaccines are ineffective. In a study conducted by Şahin et al. on physicians, similar to our study, 68.5% of the participants were not willing to be vaccinated (24). On the other hand, in a study conducted by Elhafeez et al. on medical students in 27 countries, 76.0% of the students and in another study conducted in Pakistan, 67.7% of the students accepted Mpox vaccination (25, 26). This difference may have resulted from the sociodemographic characteristics of the countries where the studies were conducted. The impact of the recent COVID-19 pandemic on the countries and the negative media news about vaccines during this period may have positively or negatively affected the idea of vaccination. However, in both studies, the majority of those who agreed to be vaccinated were individuals between the ages of 18-30 and those with a marital status of single. The fact that young people and singles are more likely to be vaccinated may suggest that young individuals have more confidence in science and technology.

62.7% of the participants obtained information about Mpox from the internet. This rate was significantly higher among 18-30 year-olds, singles and university students.

In another cross-sectional study conducted on resident physicians in Saudi Arabia, similar to our study, the internet and social media were the most common means of obtaining information (27). Another study conducted in India also showed that online sources were mostly utilized(28). This similarity may be due to the fact that the internet is the most practical and easy method of accessing information in today's age.

The majority of the participants in our study thought that Mpox was caused by various conspiracy theories such as the project to reduce the world population, biological warfare, and the greed of vaccine-pharmaceutical companies to make money. In a study conducted on the general population in Saudi Arabia, 26.7% of the participants thought that Mpox was caused by various conspiracy theories and bioterrorism (29). In another study conducted on healthcare workers in Egypt, 58.4% of the participants said that the disease was created as a biological weapon and that the official authorities' statements were a hoax (30).

Considering the increasing use of social media in recent years and the increase in information pollution in these environments, we can assume that various conspiracy theories have emerged. In the study conducted by Zenone and Caulfield using real-time data with the hashtag #monkeypox on TikTok application, 46.4% of the videos analyzed were on the theme that Mpox was deliberately released and 33.3% were on the theme that Mpox was created as an excuse for the administration of vaccines (31). The above study, which shows that social media tools are used as a tool to spread various conspiracy theories and distort accurate information, also supports this situation.

In our study, most of the participants were not aware of the Mpox vaccine. Knowledge of the Mpox vaccine was also significant in favor of individuals between the ages of 18-30, singles and university students. In a study conducted by Nath et al. in Bangladesh in 2022, the majority of the participants did not know about the Mpox vaccine (32). Similarly, in another cross-sectional study conducted by Wang et al. in China, most of the participants were not informed about the existence of a Mpox vaccine (23). This may be due to the fact that Mpox has not yet turned into a global epidemic and therefore is not taken into consideration by people.

In a study conducted among physicians in Turkey, participants over the age of 30 were more knowledgeable about the Mpox vaccine than those between the ages of 18 and 30(24). This difference may be thought to be due to differences in the occupation, educational status and location of the study.

Limitations Our study has limitations. Since the study was conducted only in Karabük province, it cannot be generalized to the population. Another limitation is that although Mpox has been declared as a global emergency by the WHO, it has not yet turned into a pandemic, which may have affected the participants' thoughts about vaccination.

CONCLUSION

In this study, we examined the sociodemographic characteristics of people in

Karabük province and their knowledge and attitudes towards Mpox disease. We found that the majority of the participants did not have sufficient knowledge, especially about the Mpox vaccine, which made us think that the importance given to preventive health services is not sufficient. In general, the results were in favor of young people, students and singles. The group most concerned about Mpox was women and those with poor economic status. The internet was the most common means of obtaining information in all groups, especially in young people and students.

The knowledge and attitudes of all segments of society are critical for combating infectious diseases. Raising public awareness about Mpox and making preparations for possible future outbreaks is of great importance for public health.

Considering that online environments and social media content have recently been used to obtain information, it may be useful to increase inspections and control to prevent information pollution, especially on health issues.

In addition, with the support of the state, it can be thought that both public service announcements and public health trainings will provide positive benefits in terms of preventive measures and vaccination in a possible Mpox epidemic.

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RESEARCH ARTICLE

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Predictive Value of Intrapartum Transperineal Ultrasonography in Determining Delivery Mode: A Prospective Study

ABSTRACT

Objective: This study aimed to evaluate the usefulness of intrapartum transperineal ultrasonographic (ITU) parameters in predicting delivery mode.

Method: This prospective study included 104 pregnant women in active labor with ruptured membranes at Düzce University Health Application and Research Center from April 2023 to April 2024. ITU measured the angle of progression (AoP), head-perineum distance (HPD), and midline angle (MLA). These parameters were compared with digital vaginal examinations and delivery outcomes.

Results: Of the participants, 93 (89.4%) had spontaneous vaginal deliveries (SVD), 6 (5.7%) had operative vaginal deliveries (OVD), and 5 (4.8%) had cesarean sections (C/S). AoP1 and AoP2 were significantly higher in the SVD group compared to OVD and C/S groups ($p<0.001$). The ΔAoP was significantly lower in the OVD group ($p=0.044$). HPD1 and HPD2 were significantly higher in the C/S group ($p=0.031$ and $p=0.041$, respectively). MLA1 and MLA2 were significantly lower in the SVD group ($p=0.002$ and $p=0.001$, respectively).

Conclusions: ITU is a valuable tool in predicting delivery mode. AoP, HPD, and MLA measurements provide objective and reliable data to assist clinicians in labor management. Further research with larger sample sizes is needed to validate these findings and establish standardized protocols for clinical use.

Keywords: Intrapartum Transperineal Ultrasound, Predicting Delivery Mode, Angle of Progression, Head-Perineum Distance.

Doğum Şeklini Belirlemede İntrapartum Transperineal Ultrasonografinin Tahmin Değeri: Prospektif Bir Çalışma

ÖZET

Amaç: Bu çalışmanın amacı, intrapartum transperineal ultrasonografi (ITU) parametrelerinin doğum şeklini öngörmedeki etkinliğini değerlendirmektir.

Yöntem: Bu prospektif çalışmaya, Nisan 2023 ile Nisan 2024 tarihleri arasında Düzce Üniversitesi Sağlık Uygulama ve Araştırma Merkezi'nde, aktif doğum eylemi içinde ve membranları rüptüre olmuş 104 gebe dahil edilmiştir. ITU ile ilerleme açısı (AoP), baş-perine mesafesi (HPD) ve orta hat açısı (MLA) ölçümleri yapıldı. Bu parametreler, dijital vajinal muayene bulguları ve doğum sonuçları ile karşılaştırıldı.

Bulgular: Katılımcıların 93'ü (%89,4) spontan vajinal doğum (SVD), 6'sı (%5,7) operatif vajinal doğum (OVD) ve 5'i (%4,8) sezaryen (C/S) ile doğum yaptı. AoP1 ve AoP2 değerleri, SVD grubunda OVD ve C/S gruplarına kıyasla anlamlı derecede yüksekti ($p<0,001$). ΔAoP değeri OVD grubunda anlamlı derecede düşük bulundu ($p=0,044$). HPD1 ve HPD2 ölçümleri C/S grubunda anlamlı olarak daha yüksekti (sırasıyla $p=0,031$ ve $p=0,041$). MLA1 ve MLA2 değerleri ise SVD grubunda anlamlı derecede daha düşüktü (sırasıyla $p=0,002$ ve $p=0,001$).

Sonuç: ITU, doğum şeklini öngörmede değerli bir araçtır. AoP, HPD ve MLA ölçümleri, doğum yönetiminde klinisyenlere yardımcı olabilecek objektif ve güvenilir veriler sağlamaktadır. Bu bulguların doğrulanması ve klinik kullanıma yönelik standart protokollerin oluşturulması için daha büyük örneklem gruplarıyla ek çalışmalara ihtiyaç vardır.

Anahtar Kelimeler: İntrapartum Transperineal Ultrasonografi, Doğum Şeklini Tahmin, İlerleme Açısı, Baş-Perine Mesafesi.

INTRODUCTION

Birth is a process that begins with regular uterine contractions and ends with the delivery of the baby and the expulsion of the placenta. When it occurs normally, it is referred to as labor. However, the abnormal slowing of labor and the presence of complications, known as dystocia, pose serious risks to both the mother and the baby.(1)

In the monitoring of labor, the five-parameter Bishop score, determined through digital vaginal examination (DVE), is commonly used. These parameters include cervical dilation, effacement, cervical consistency, cervical position, and fetal head station. DVE is a subjective method that can lead to different interpretations among clinicians and, consequently, variations in decisions regarding the mode of delivery. Additionally, frequent repetition of DVE, particularly in the presence of ruptured amniotic membranes, increases the risk of intrauterine infection.(2, 3)

Due to these disadvantages, intrapartum ultrasonography can be used as an alternative to DVE for a more objective assessment of labor. Intrapartum ultrasonography provides more reliable data on the progression of labor and the prediction of the mode of delivery, facilitating the recognition of dysfunctional labor and labor arrest.(4, 5)

Currently, the most common reason for primary cesarean delivery is dysfunctional labor, followed by abnormal fetal cardiotocography, fetal malpresentation, multiple pregnancies, and suspected fetal macrosomia.(6) Subsequent deliveries after a cesarean are usually performed via repeat cesarean due to increased obstetric risks. Compared to vaginal delivery, cesarean delivery carries higher risks of complications for both the mother and the fetus and has become a significant economic and socio-demographic issue worldwide. Increased cesarean rates during the second stage of labor significantly elevate maternal mortality and morbidity.(7, 8)

Standardizing the diagnosis of dysfunctional labor using intrapartum ultrasonography parameters can reduce primary cesarean rates and help prevent fetal-maternal complications. Unlike DVE, ultrasonography is a non-invasive method that is easily acceptable to patients and provides more reliable information.(9, 10)

In obstetric practice, ultrasonography was initially used to assess fetal development, fetal well-being, and fetal abnormalities. With technological advancements, the use of intrapartum ultrasonography to monitor the progression of labor has increased. Intrapartum ultrasonographic imaging techniques allow for the objective detection of changes in fetal head position during labor. In recent years, intrapartum ultrasonography has been shown to provide an objective evaluation of fetal head descent. Studies using a transabdominal convex ultrasonography probe highlight the clinical benefits of this technique in managing labor.(11)

Ultrasonographic imaging based on objective data stands out as a useful tool for monitoring positional changes of the fetal head in the birth canal and tracking labor progression. This method can help predict complications such as dystocia and labor arrest in advance.(12) Intrapartum ultrasonography has a higher accuracy rate compared to subjective and experience-based DVE in determining fetal head position and monitoring labor.(13) Standardizing the data obtained from intrapartum ultrasonography can aid in understanding the pathophysiology of dysfunctional labor, thereby providing clinical advantages in labor management.(14)

This study aims to investigate the effectiveness of using intrapartum ultrasonography during the active phase of the first stage of labor in predicting delivery outcomes

MATERIAL AND METHODS

This prospective study was conducted at the Department of Obstetrics and Gynecology, Düzce University Health Application and Research Center, between April 2023 and April 2024. The study was approved by the Non-Interventional Health Research Ethics Committee of Düzce University (2023/63). Informed consent was obtained from all participants, and no incentives were provided for participation. All procedures followed the ethical standards of the institutional research committee and the 1964 Declaration of Helsinki.

A total of 104 pregnant women, comprising 39 nulliparous and 65 multiparous, who presented to our clinic between 37-41 weeks of gestation, with a singleton, cephalic presentation, active labor, and ruptured amniotic membranes, were included in the study.

Exclusion criteria were non-cephalic presentation, multiple pregnancies, gestational age less than 37 weeks or more than 42 weeks, a history of uterine surgery, non-reassuring fetal heart trace, fetal anomalies, and suspicion of chorioamnionitis. Active labor was defined as cervical dilation of 5 cm or more and uterine contractions of at least three in 10 minutes totaling 200-250 Montevideo units. Induction with oxytocin was performed for those with spontaneous uterine contractions starting below 200-250 Montevideo units, and augmentation was provided if spontaneous contractions were insufficient. Induction and augmentation were performed by adding 10 IU of oxytocin to 1000 cc of Ringer lactate solution, starting at 4 mU/min and increasing by 4 mU/min every 15 minutes to a maximum of 40 mU/min. The women were closely monitored with intermittent fetal monitoring while receiving oxytocin.

Ultrasonographic Evaluation: Maternal characteristics such as age, gravida, parity, gestational week, height, weight, body mass index, use of oxytocin for induction or augmentation, episiotomy status, cervical dilation, effacement, fetal head station during digital pelvic examination, mode of delivery, parameters obtained from intrapartum ultrasonography, and neonatal outcomes were recorded. If the last menstrual period (LMP) was known accurately and the ultrasound measurements differed by less than 14 days from the LMP, the LMP was used to calculate the gestational week. If the LMP was unknown, the gestational age was calculated using the crown-rump length (CRL) from the first trimester ultrasound measurements. If there were no first trimester ultrasound records, the biparietal diameter (BPD) from the second trimester ultrasound was used. In the absence of first and second trimester ultrasound records, the gestational age was calculated using femur length (FL) and BPD from the third trimester.(15) Ultrasonographic measurements were performed by a single researcher using a Mindray DC-40 ultrasound device (2017-10-28, Seoul, Korea) with a 3-5 MHz convex transabdominal probe. Patients were prepared for examination in the dorsolithotomy position with an empty bladder. Initially, the fetal head position was assessed via abdominal ultrasonography according to the International Society of Ultrasound in Obstetrics and Gynecology (ISUOG) guidelines.(16) If both eye orbits were visible, it was recorded as occiput posterior; if midline brain structures were visible, it was recorded as occiput transverse; and if the occiput and spine in the neck region were visible, it was recorded as occiput anterior. Subsequently, transperineal ultrasonography was performed. Gel was applied to the abdominal probe, which was then covered with a sterile glove. The probe was placed between the labia at the fourchette level in the mid-sagittal plane during uterine relaxation. By making slight lateral movements, a clear view of the symphysis pubis and the pubic rami of the fetal head was obtained. The angle of progression (AoP) was measured following the ISUOG guidelines(16), defined as the angle between a line drawn from the superior to the inferior apex of the maternal symphysis pubis and another line from the inferior apex of the symphysis tangent to the fetal occiput. The AoP was recorded. The edematous caput succedaneum observed in front of the fetal head was not considered as the leading part of the fetal head; the bony part of the fetal head was accepted as the leading part.

Subsequently, the ultrasound probe was moved from the sagittal to the transverse plane. The probe was gently pressed towards the pubic bone without causing discomfort to the patient, and the angle between the echogenic line of the interhemispheric fissure and the anterior-posterior axis of the symphysis pubis was measured, termed the midline angle (MLA). Following the ISUOG guidelines (16), the fetal head direction (HD) was identified based on the angle between the long axis of the symphysis pubis and the longest axis of the fetal head. The head perineum distance (HPD) was measured as the shortest distance between the outermost part of the fetal head and the perineum. Each parameter was measured three times, and the averages were recorded. Parameters were remeasured while the patient actively pushed. Differences between resting and pushing measurements were recorded and expressed as Δ (Δ AoP, Δ MLA, Δ HPD). Caput succedaneum and molding were evaluated and recorded via ultrasonography. The total measurement time for all parameters did not exceed 90 seconds. Intrapartum transperineal ultrasonographic measurements are given in figure 1.

Figure 1. Intrapartum Transperineal Ultrasonographic Measurements. A: Angle of Progression (AoP) measurement. The Angle of Progression is measured between a line drawn from the superior to the inferior apex of the maternal symphysis pubis and another line starting from the inferior apex of the symphysis and tangent to the fetal occiput. B: Head-Perineum Distance (HPD) measurement. The Head-Perineum Distance represents the shortest distance from the outer bony boundary of the fetal skull to the perineum.C: Midline Angle (MLA) measurement. The Midline Angle is defined as the angle between the anteroposterior axis of the maternal pelvis and the interhemispheric midline of the fetal head.

Statistical Analysis: Descriptive statistics of the measurements were calculated as mean, standard deviation (SD), median, 25th and 75th percentiles, count, and percentage frequencies. The normality of the numerical features obtained from the measurements was examined with the Shapiro-Wilk test. For numerical features, group comparisons were performed using the Kruskal-Wallis test and the Mann-Whitney U test where appropriate. Spearman rank correlation analysis was utilized for assessing the relationships between numerical features. For categorical features, the Fisher-Freeman-Halton exact test was applied to examine relationships. The results of these tests are presented in the corresponding tables. The level of statistical significance was set at p ≤ 0.05. All calculations were performed using SPSS software (version 23).

RESULTS

Sample Characteristics: The study followed the labor progression of 104 pregnant women who met the study criteria. Among these participants, 65 (62.5%) were multiparous, and 39 (37.5%) were nulliparous. The delivery outcomes were as follows: 93 (89.4%) resulted in spontaneous vaginal delivery (SVD), 5 (4.8%) in cesarean section (C/S), and 6 (5.7%) in operative vaginal delivery (OVD). **(Table 1)**

Table 1. Demographic Characteristics, Gestational Age, and Parity by Delivery Mode

Variable	SVD (n=93)	OVD (n=6)	C/S (n=5)	p-value	Kruskal-Wallis H
Age (years) (mean ± SD)	28.1 ± 9.1	30 ± 7	27.4 ± 4.5	0.689	0.746
Body Mass Index (mean ± SD)	29.3 ± 4.8	32.4 ± 4.8	31.6 ± 5	0.165	3.606
Gestational Age (days) (mean ± SD)	273.9 ± 7.7	276.6 ± 8	280 ± 5.3	0.189	3.332
Parity (n, %) (Nulliparous)	32 (34.4%)	2 (33.3%)	5 (100%)	0.030*	6.984
Parity (n, %) (Multiparous)	61 (65.6%)	4 (66.7%)	0 (0%)		

*: significant difference p<0.05. SD: Standard deviation. BMI: Body mass index.SVD: Spontaneous vaginal delivery. OVD: Operative vaginal delivery.C/S: Cesarean section

Cervical Dilation, Effacement, and Fetal Head Station: The average cervical dilation was found to be 6.3 ± 1.3 cm in the spontaneous vaginal delivery group, 5.2 ± 0.4 cm in the cesarean section group, and 7 ± 1.2 cm in the operative vaginal delivery group. Effacement percentages were 65.5 ± 11.8%, 56 ± 5.4%, and 73.3 ± 10.3%, respectively, for the three groups. Fetal head station averages were -2.1 ± 1.2, -2.8 ± 0.4, and -2.3 ± 1.2, respectively. Cervical dilation was significantly lower in the cesarean section group compared to the operative vaginal delivery group (p=0.050). Effacement was significantly lower in the cesarean section group compared to the operative vaginal delivery group (p=0.047). No significant differences were found among the groups regarding fetal head station. **(Table 2)**

Table 2. Cervical Dilation, Effacement, and Fetal Head Station by Delivery Mode

Variable	SVD (n=93)	OVD (n=6)	C/S (n=5)	p-value	Kruskal-Wallis H
Cervical Dilation (cm) (mean ± SD)	6.34 ± 1.32	7.00 ± 1.27	5.20 ± 0.45	0.050*	5.953
Effacement (%) (mean ± SD)	65.59 ± 11.84	73.33 ± 10.33	56.00 ± 5.48	0.047*	6.123
Fetal Head Station (mean ± SD)	-2.14 ± 1.20	-2.33 ± 1.21	-2.80 ± 0.45	0.934	1.668

*: significant difference p<0.05. SD: Standard deviation. SVD: Spontaneous vaginal delivery. OVD: Operative vaginal delivery.C/S: Cesarean section

Labor Duration, Angle of Progression (AoP), and Head-Perineum Distance (HPD): The average time from examination to delivery was highest in the cesarean section group, followed by the operative vaginal delivery group, and was lowest in the spontaneous vaginal delivery group (P=0.019). AoP1 and AoP2 were significantly higher in the spontaneous vaginal delivery group compared to the other groups (p<0.001). ΔAoP was significantly lower in the operative vaginal delivery group compared to the other groups (p=0.044). HPD1 and HPD2 were significantly higher in the cesarean section group compared to the other groups (p=0.031 and p=0.041, respectively). **(Table 3)**

Midline Angle (MLA) and Head Direction (HD): The mean MLA1 (at rest) and MLA2 (during pushing) in the spontaneous vaginal delivery group were significantly lower compared to the other two groups (p=0.002 and p=0.001, respectively). There were no significant differences in ΔMLA among the three groups. HD1 and HD2 were significantly different among the groups (p<0.001). **(Table 4)**

Table 3. Labor Duration, Angle of Progression (AoP), and Head-Perineum Distance (HPD) by Delivery Mode

Variable	SVD (n=93)	OVD (n=6)	C/S (n=5)	p-value	Kruskal-Wallis H
Examination to Delivery Duration (min) (mean ± SD)	116.11 ± 102.47	133.67 ± 127.40	272.40 ± 105.67	0.019*	7.957
AoP1 (degrees) (mean ± SD)	134.47 ± 10.92	112.50 ± 7.87	117.20 ± 5.93	<0.001*	22.316
AoP2 (degrees) (mean ± SD)	143.71 ± 9.96	115.67 ± 7.76	126.00 ± 12.21	<0.001*	22.520
ΔAoP (degrees) (mean ± SD)	9.11 ± 6.03	3.33 ± 2.16	8.80 ± 6.42	0.044*	6.233
HPD1 (mm) (mean ± SD)	38.55 ± 10.92	35.17 ± 8.50	49.00 ± 5.20	0.031*	6.964
HPD2 (mm) (mean ± SD)	35.32 ± 10.74	32.00 ± 10.58	46.00 ± 4.42	0.041*	6.396
ΔHPD (mm) (mean ± SD)	3.04 ± 3.03	3.17 ± 7.08	3.00 ± 1.00	0.981	0.039

*: significant difference p<0.05. SD: Standard deviation. SVD: Spontaneous vaginal delivery. OVD: Operative vaginal delivery. C/S: Cesarean section AoP: Angles of progression. HPD: Head-perineum distance

Table 4. Midline Angle and Head Direction by Delivery Mode

Variable	SVD (n=93)	OVD (n=6)	C/S (n=5)	p-value	Kruskal-Wallis H
MLA1 (degrees) (mean ± SD)	61.82 ± 27.88	91.50 ± 23.54	88.00 ± 13.04	0.002*	12.751
MLA2 (degrees) (mean ± SD)	56.66 ± 26.03	90.00 ± 27.18	91.40 ± 19.58	0.001*	13.636
ΔMLA (degrees) (mean ± SD)	5.12 ± 16.23	1.50 ± 8.69	-3.40 ± 6.84	0.100	4.621
HD1 (at rest) (%) - Down	9 (9.7%)	4 (66.7%)	3 (60%)	<0.001*	-
HD1 (at rest) (%) - Up	84 (90.3%)	2 (33.3%)	2 (40%)	<0.001*	-
HD2 (during pushing) (%) - Down	6 (6.5%)	4 (66.7%)	3 (60%)	<0.001*	-
HD2 (during pushing) (%) - Up	87 (93.5%)	2 (33.3%)	2 (40%)	<0.001*	-

*: significant difference p<0.05. SD: Standard deviation. SVD: Spontaneous vaginal delivery. OVD: Operative vaginal delivery. C/S: Cesarean section. MLA: Midline Angle. HD: Head Direction.

DISCUSSION

In this study, we aimed to investigate the utility of intrapartum transperineal ultrasound parameters in predicting the mode of delivery. The clinicians who performed the ultrasound examinations were different from those who conducted the digital vaginal examinations immediately afterward, evaluating cervical dilatation, effacement, and fetal head station. By ensuring that the teams were blinded to each other's findings (double-blind), we aimed to enhance the reliability of the data obtained.

The introduction of ultrasound in obstetrics has made it possible to predict and avoid risky vaginal deliveries or operative vaginal deliveries. Ultrasound helps foresee dangerous situations during labor, aiding obstetricians in choosing the less risky path for both the mother and the fetus. According to Chan and Lau(17), compared with digital vaginal examination, ultrasound examination is objective and more accurate. This finding was supported in our study; intrapartum ultrasound improved the accurate diagnosis of fetal head position and instrument placement accuracy. As recommended by the International Society for Ultrasound in Obstetrics and Gynecology, ultrasound examination when there is a suspicion of delay or arrest in the first or second stage of labor facilitates correct decision-making.

Prolongation or arrest of the active phase of labor requires making difficult decisions, as these situations must be managed quickly either through operative vaginal delivery or cesarean section. Both failed operative vaginal delivery and late cesarean section, when the fetal head is deeply engaged, can lead to severe complications for both the mother and the fetus. Accurate assessment of the dynamic progression of the fetal head is therefore crucial in such clinical scenarios. In our study, the angles of progression (AoP1 and AoP2) were significantly higher in the spontaneous vaginal delivery group than in the operative vaginal delivery and cesarean section groups. This finding is consistent with the work of Jung and Lee(18), who found that the angle of progression (AoP) showed high reproducibility and accuracy in assessing fetal head descent. Furthermore, a systematic review by Nassr et al.(19) reported that certain AoP ranges (108°-119°, 120°-140°, and 141°-153°) showed high sensitivity and specificity in predicting spontaneous vaginal delivery. In our study, we observed that AoP values were effective in predicting mode of delivery.

Head-perineum distance (HPD) measurements were significantly higher in the cesarean section group than in the operative vaginal and spontaneous vaginal delivery groups. Chan and Lau(17) found that a head-perineum distance of 40 mm or more was associated with an increased risk for difficult assisted vaginal delivery. However, the inability of HPD to follow the curve of the birth canal makes direct comparison with clinical assessment of the fetal head station difficult. This is another important finding observed in our study.

Midline angle (MLA) measurements were significantly lower in the spontaneous vaginal delivery group than in the operative vaginal delivery and cesarean section groups. This emphasizes the importance of ultrasound in the assessment of fetal head rotation. This finding is echoed in the study by Gimovsky and Berghella(20), who found that ultrasound-assisted coaching offers potential benefits in improving birth outcomes, but its routine use is not recommended.

Arthuis et al.(21) developed a method based on simultaneous ultrasound imaging of both the maternal symphysis pubis and the fetal head to objectively assess the fetal station. Their study examined the accuracy of fetal head station determined by digital examination compared to that assessed by ultrasound. Malvasi et al.(22) highlighted the limitations of digital vaginal examination in assessing fetal head position during labor. Their study used intrapartum ultrasonography and the Artificial Intelligence Dystocia Algorithm (AIDA), revealing significant misclassifications by both obstetricians and midwives.

Consistent with the literature, our study found that the mean angles of progression (AoP1 and AoP2) were significantly higher in the spontaneous vaginal delivery group compared to the operative vaginal delivery and cesarean groups. Additionally, the mean ΔAoP was significantly lower in the operative delivery group compared to the other two groups.

Head-perineum distance measurements were significantly higher in the cesarean group compared to the operative vaginal and spontaneous vaginal delivery groups. HPD was found to be an important parameter in predicting spontaneous vaginal delivery. However, the primary limitation of HPD is its inability to follow the curve of the birth canal, making direct comparison with clinical assessment of fetal head station challenging.

Midline angle measurements were significantly lower in the spontaneous vaginal delivery group compared to the operative vaginal delivery and cesarean groups, highlighting the importance of ultrasound in assessing fetal head rotation.

Limitations

The limitations of our study include the relatively small sample size and the fact that ultrasound measurements were performed by a single physician using a single ultrasound machine. This may limit the generalizability of the results. Additionally, patients were only examined once; continuous ultrasound assessment throughout the stages of labor would have provided more comprehensive data.

CONCLUSION

This study evaluated the potential impact of intrapartum ultrasound on predicting the mode of delivery and managing labor. Our study suggests that ultrasound can provide objective assessment and contribute to clinical decision-making processes. Future research is needed to better understand the role and scope of intrapartum ultrasound in clinical practice.

Declarations

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Authors Contributions: All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by CT, BK, EY and FGG. The first draft of the manuscript was written by CT, BK, AB and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Consent to participate: Informed consent was obtained from all individual participants included in the study.

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RESEARCH ARTICLE

Attitudes of Family Medicine Residents towards the Elderly in Turkey: A Cross-Sectional Study

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ABSTRACT

Objective: Healthcare services to the geriatric population are provided mainly by family physicians working. Therefore, family physicians' attitudes towards the elderly are key to the quality of healthcare services this population receives. This study was conducted to investigate the attitudes of family medicine residents who will soon work in primary healthcare institutions towards the elderly and the factors affecting these attitudes.

Method: This cross-sectional study featured an online survey. The data collection form included the University of California, Los Angeles Geriatrics Attitudes Scale (UCLA-GAS) and questions about residents' sociodemographic characteristics and attitudes towards the elderly.

Results: Of the 386 full-time family medicine residents included in the sample, 69.7% were under the age of 30, and 72% were female. The mean duration the residents had been practicing medicine was 4.15±2.86 years, and the mean duration they had been residents was 22.6±11.2 months. Residents' attitudes towards the elderly were neutral-to-slightly positive. The mean UCLA-GAS scores of residents who did not receive structured geriatrics education as part of their family medicine residency were found to be significantly higher than those who did (p=0.007).

Conclusions: Improving the positive attitudes of primary care physicians, to whom the elderly population first consults to receive health care, is important in terms of keeping the elderly population healthy and successful aging.

Keywords: Elderly, Attitude of Health Personnel, Family Practice, Ageism, Health Services for the Elderly, Geriatrics.

Türkiye'deki Aile Hekimliği Asistanlarının Yaşlılara Karşı Tutumları: Kesitsel Bir Çalışma

ÖZET

Amaç: Türkiye'de yaşlı nüfusa yönelik sağlık hizmetleri ağırlıklı olarak birinci basamak sağlık kurumlarında çalışan aile hekimleri tarafından sağlanmaktadır. Dolayısıyla, aile hekimlerinin yaşlılara yönelik tutumları yaşlı nüfusun aldığı sağlık hizmetlerinin kalitesi açısından kilit öneme sahiptir. Bu çalışma, yakın gelecekte birinci basamak sağlık kurumlarında çalışacak olan aile hekimliği asistanlarının yaşlılara yönelik tutumlarını ve bu tutumlarını etkileyen faktörleri araştırmak amacıyla yapılmıştır.

Yöntem: Kesitsel olarak tasarlanan çalışmada katılımcılara çevrimiçi anket uygulanmıştır. Veri toplama formunda Kaliforniya Üniversitesi Los Angeles Geriatri Tutum Ölçeği (UCLA-GAS) ile sosyodemografik özellikler ve yaşlılığa dair sorular yer almıştır.

Bulgular: Örnekleme %69,7'si 30 yaşın altında ve %72'si kadın olan 386 tam zamanlı aile hekimliği asistanı dahil edilmiştir. Asistanların ortalama hekimlik süreleri 4,15±2,86 yıl ve asistanlık süreleri ise 22,6±11,2 ay olarak hesaplanmıştır. Asistanların yaşlılara yönelik tutumlarının nötr-hafif olumlu olduğu görülmüştür. Uzmanlık eğitimi sırasında yapılandırılmış yaşlı sağlığı eğitimi almayan asistanların UCLA-GAS puan ortalamaları, alan asistanlara göre anlamlı düzeyde yüksek bulunmuştur (p=0,007).

Sonuç: Yaşlı nüfusun sağlık hizmeti almak için ilk başvuru noktası olan birinci basamak hekimlerinin olumlu tutumlarının geliştirilmesi, yaşlı nüfusun sağlıklı ve başarılı yaşlanma açısından önemlidir.

Anahtar Kelimeler: Yaşlı, Sağlık Personeli Tutumu, Aile Hekimliği, Yaşlı Ayrımcılığı, Yaşlılar İçin Sağlık Hizmetleri, Geriatri.

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INTRODUCTION

As life expectancy increases and the population ages, chronic disease and care burden increases, and quality of life decreases (1,2). Society's attitudes and behaviors towards the elderly change as the elderly become physically, psychologically, socially and economically dependent (3). Considering that discriminatory attitudes towards the elderly may negatively affect the quality of healthcare services received by the elderly population, it is crucial to assess the attitudes of primary care physicians, who provide the most accessible and cost-effective healthcare services to the elderly population, towards the elderly (4,5). To improve the lives of the elderly and eliminate inequalities against the elderly, WHO recommends changing thoughts and actions against discrimination against the elderly, providing sensitive, individualized, integrated care and primary healthcare services to the elderly, and carrying out studies to improve the lives of the elderly and their families to ensure their access to long-term care (6).

Given the need to make specific evaluations for the elderly, physicians must master comprehensive geriatric evaluation skills (7–9). Tufan et al. found that the only factor that positively affected the attitudes of internal medicine residents towards the elderly was the geriatric clerkship (10). Although there are many studies investigating the attitudes of undergraduate students studying medicine and nursing in our country towards the elderly, the number of studies investigating the attitudes of family medicine (FM) residents towards the elderly is limited.

In view of the foregoing, this study was conducted to investigate the attitudes of full-time FM residents who will soon begin working in primary healthcare institutions towards the elderly and the factors affecting these attitudes.

MATERIAL AND METHODS

The study protocol was approved by the local ethics committee. The population of this cross-sectional descriptive study consisted of approximately 1200 FM residents who were receiving full-time specialty training in Turkey as of December 2020, according to the Turkish Association of Family Physicians (TAHUD). The power analysis performed with the G*Power software revealed that the sample should consist of a minimum of 280 subjects for effect size = 0.25, α = 0.05, and Power (1-β) = 0.95. In the end, the study sample consisted of 386 full-time FM residents who met the study's inclusion criteria. Participants were reminded three times with a ten-day interval to fill out the data collection form only once online via the Google Forms application between December 25th, 2020, and January 25th, 2021. The first section of the data collection form, which comprised 7 sections and 35 questions in total, consisted of the University of California, Los Angeles Geriatrics Attitudes Scale (UCLA-GAS), developed by Reuben et al. (1998) and the Turkish validity and reliability study which were conducted by Şahin et al. (2012) (11,12). UCLA-GAS is a 14-item 5-point Likert-type scale containing statements addressing both positive and negative attitudes toward the elderly. Its subscales and the minimum and maximum scores that can be obtained from these subscales are as follows: social values (min: 2, max: 10), medical care (min: 4, max: 20), compassion (min: 4, max: 20), and resource distribution (min: 4, max: 20). The lowest and highest total scores that can be obtained from the scale are 14 and 70. Higher scores indicate a more positive attitude. The necessary permission to use UCLA-GAS was obtained from those who own its intellectual property rights. The remaining six sections of the data collection form, which comprised 21 questions about the residents' sociodemographic characteristics and attitudes towards the elderly, were created by the researcher based on a comprehensive review of the current literature.

Statistical Analysis: Statistical analyses of the collected data were conducted using IBM SPSS 20.0 (IBM Corp., Armonk, NY, USA). The variables examined within the scope of the study were evaluated for conformity to the normal distribution using the Kolmogorov-Smirnov and Shapiro-Wilk tests. Numerical variables were expressed as mean±standard deviation or median (25^{th}-75^{th} percentile) values, and categorical variables were expressed as frequencies (n) and percentage (%) values. Since the variables were not normally distributed, differences between groups were determined using the Mann-Whitney U and Kruskal-Wallis tests, and Dunn's test was used for multiple comparisons. Spearman correlation analysis was used to analyze the relationships between numerical variables. In testing two-way hypotheses, probability (p) statistics of <0.05 were considered sufficient for statistical significance.

RESULTS

Participants' Sociodemographic Characteristics: Of the 386 participants, 278 (72%) were female, 106 (27.5%) were male, and 2 (0.5%) did not specify their gender. 69.7% of the participants were under 30 years of age, and 30.3% were 30 years of age or older. 58.3% of the participants were married. 64.5% of the participants did not have children, 22.5% had one child, and 13% had 2 or more children. In terms of income status, 47.7% of the participants' income was more than their expenses, 41.2%'s income was equal to their expenses, and 11.1%'s income was less than their expenses. Considering the type of family the participants lived with until they were enrolled in medical school, 83.9% lived with a nuclear family, 13.7% with an extended family, 1% with a single-parent family, and 1.3% with other types of families.

Participants' Professional Experience: Of the participants, 68.9% were working in university hospitals, and 31.1% in training and research hospitals. The mean duration the residents had been practicing medicine was 4.15±2.86 (min: 1, max: 30) years, and the mean duration they had been residents was 22.6±11.2 (min: 1, max: 63) months. Participants' work experiences in geriatric care services such as palliative care services, family health centers, T-FHCs (Family Health Centers providing clinical training to family medicine residents), nursing homes, or geriatric care centers are shown in Table 1. In terms of the frequency of visiting nursing homes, it was determined that 57.3% of the participants had never visited a nursing home before.

Table 1. Participants' Professional Experiences in Institutions Providing Geriatric Care Services

Services	Never worked	Worked/will work during residency	Worked before residency	Total
Home Healthcare Services	239 (61.9)	67 (17.4)	80 (20.7)	386 (100)
Palliative Care Services	322 (83.4)	42 (10.9)	22 (5.7)	386 (100)
T-FHCs	285 (73.8)	91 (23.6)	10 (2.6)	386 (100)
Family Health Centers	273 (70.7)	29 (7.5)	84 (21.8)	386 (100)
Nursing Homes/Geriatric Care Centers	377 (97.7)	3 (0.8)	6 (1.6)	386 (100)

Values are presented as n (%). T-FHCs: Family Health Centers providing clinical training to family medicine residents

Participants' Geriatrics Education Background: The rate of the participants who graduated from a medical school with a geriatrics clinic was 34.2%. However, 43.3% of the participants stated that the geriatric education they received in medical school was not sufficient at all by the time of their graduation, and 56.7% stated that it was somewhat sufficient or sufficient.

While the rate of participants working as a resident in a hospital with a geriatrics clinic was 29.5%, the rate of those whose departments offered a structured geriatrics education program was 35.2%. In response to the question "Indicate your level of competence in 'Applying interventions in typical cases that are not complex and frequently seen' as specified in the Core Curriculum of Family Medicine Specialty Training on geriatric care management (v2.4-2019), 37% of the participants stated that they did not find themselves competent at all, 54.4% found themselves somewhat competent, and only 8.5% found themselves competent. Of the participants, 64% stated that they had not attended any courses, seminars, or panels on geriatric care. Table 2 shows how competent the residents consider themselves in some geriatric topics.

Table 2. Participants' Perceived Competence in Geriatric Care

Parameters	Not competent at all	Somewhat competent	Highly competent	Total
Elderly nutrition	118 (30.6)	221 (57.3)	47 (12.2)	386 (100)
Movement disorders and exercise in elderly	105 (27.2)	237 (61.4)	44 (11.4)	386 (100)
Communication with elderly	29 (7.5)	208 (53.9)	149 (38.6)	386 (100)
Mental status assessment	63 (16.3)	234 (60.6)	89 (23.1)	386 (100)
Principles of medication use in elderly	92 (23.8)	236 (61.1)	58 (15.0)	386 (100)
Multimorbidity management	135 (35.0)	213 (55.2)	38 (9.8)	386 (100)
Cognitive problems	122 (31.6)	216 (56.0)	48 (12.4)	386 (100)
Sleep disorders	131 (33.9)	207 (53.6)	48 (12.4)	386 (100)
Social aspects of aging*	112 (29.0)	222 (57.5)	52 (13.5)	386 (100)
Legal issues and abuse	170 (44.0)	170 (44.0)	46 (11.9)	386 (100)

Values are presented as n (%). *Social aspects include social security, social support, loneliness, healthcare accessibility, and economic aspects

Of the participants, 71.2% said that geriatrics should be a subspecialty of FM. When asked whether they would like to work in institutions that provide geriatric care services in the future, 44% of the participants were positive, while 40.7% were undecided.

Participants' Relationships with and Perceptions of Elderly People: The rate of participants who had a family member aged 65 and over was 80.1% and 43% of these elderly individuals were living with their spouses in their own homes. It was determined that 49.2% of the participants had previously lived in the same house with an elderly person. Most of the participants (95.1%) did not have a family member who needed care. 35.8% of the participants said they could live with elderly family members, while 46.4% were undecided. When the participants rated their level of relationship with the elderly between 1-7, it was found to be 4.52±0.926 (min 1, max 6).

UCLA Geriatrics Attitudes Scale Scores: The mean UCLA-GAS score of the participants was 42.88 ± 6.20 (min 25, max 62). No statistically significant relationship was found between the participants' UCLA-GAS scores and sociodemographic characteristics. Participants' total and subscale scores are given in Table 3, and the relationships between participants' UCLA-GAS scores and sociodemographic characteristics are given in detail in Table 4.

Table 3. Participants' total UCLA-GAS score and UCLA-GAS subscale scores

Subscales	**Values**
Social values	6.72 ± 1.58; 7 [2-10]; 6-8
Medical care	13.96 ± 3.05; 14 [4-20]; 12-16
Compassion	10.17 ± 4.64; 9 [4-20]; 6-13
Resource distribution	12.01 ± 2.55; 12 [4-19]; 10-14
Total UCLA-GAS score	42.88 ± 6.20; 42 [25-62]; 38-47

Values are presented as mean ± SD; median [min-max]; IQR [25th-75th percentile]. UCLA-GAS: University of California, Los Angeles Geriatrics Attitudes Scale

No significant correlation was found between participants' total or subscale scores and the mean duration the participants had been practicing medicine, or they had been residents (p>0,05). Similarly, no significant correlation was found between participants' total or subscale scores and the presence of a geriatric clinic in the medical schools where they completed their medical education or whether they received geriatric care education as part of their medical education(p>0,05). On the other hand, those who stated that they did not/will not receive a structured geriatrics education as part of their FM residency had significantly higher total, compassion and resource distribution subscale scores compared to those who received training in geriatrics during their residency (43 vs. 41, p=0.007; 39 vs.37, p=0.002; 47 vs. 47, p=0.007; respectively) (Table 5).

Table 4. The relationships between participants' UCLA-GAS scores and sociodemographic characteristics

Characteristics	**n (%)**	**Social values***	**Medical care***	**Compassion***	**Resource distribution***	**Total UCLA-GAS score***
Age						
<30 years	269 (69.6)	7 (6-8)	15 (12-16)	9 (6-13)	12 (10-14)	42 (39-47)
≥30 years	117 (30.3)	7 (6-7)	14 (12-16)	10 (6-13)	12 (10-14)	42 (38-47)
p-value		0.246	0.072	0.634	0.965	0.288
Gender						
Female	278 (72.0)	7 (6-8)	14 (12-16)	9 (6-12.2)	12 (10-14)	42 (38-47)
Male	106 (27.4)	7 (6-8)	14 (11-17)	11 (7-15)	12 (10-13)	44 (39-48)
p-value		0.099	0.864	0.101	0.656	0.132
Marital status						
Single	161 (41.7)	7 (6-8)	15 (12-17)	9 (6-13)	12 (10-14)	42 (39-47)
Married	225 (58.2)	7 (6-8)	14 (12-16)	10 (6-13)	12 (11-14)	42 (38-47)
p-value		0.826	0.070	0.703	0.262	0.957
Number of children						
0	249 (64.5)	7 (6-8)	14 (12-16)	9 (6-12)	12 (10-14)	43 (39-47)
1	87 (22.5)	7 (6-7)	14 (11-16)	10 (6-15)	13 (10-14)	42 (37-47)
≥2	50 (12.9)	7 (6-8)	14 (11-16)	11 (7-15.25)	12 (10-13)	42.50 (38-46.25)
p-value		0.486	0.535	0.730	0.478	0.672
Income status						
Income < expenses	43 (11.1)	7 (5-8)	13 (11-15)	11 (8-13)	11 (10-13)	42 (39-45)
Income = expenses	159 (41.1)	7 (6-8)	14 (12-16)	9 (6-13)	12 (10-14)	42 (38-47)
Income > expenses	184 (47.6)	7 (6-8)	15 (11.25-16)	9 (6-13)	12 (10-14)	42 (38-47.75)
p-value		0.454	0.101	0.372	0.511	0.808
Family type						
Nuclear family	324 (83.9)	7 (6-8)	14 (12-16)	9 (6-13)	12 (10-14)	42 (38-47)
Other	62 (16.0)	7 (6-8)	14.50 (12-17)	10 (6-13)	12 (11-14)	43 (39.75-48)
p-value		0.329	0.470	0.794	0.417	0.230

*Values are presented as median (IQR). UCLA-GAS: University of California, Los Angeles Geriatrics Attitudes Scale. p-values were calculated using Mann-Whitney U test for two groups and Kruskal-Wallis test for three or more groups.

Table 5. The Relationships Between Participants' UCLA-GAS Scores and Geriatric Education Background

Characteristics	**n (%)**	**Social values***	**Medical care***	**Compassion***	**Resource distribution***	**Total UCLA-GAS score***
Structured geriatrics education during residency						
Yes	136 (35.2)	7 (6-8)	14 (12-16)	8 (5-12)	11 (9-13.75)	41 (37-47)
No	250 (64.7)	7 (6-8)	14 (11-16)	11 (7-14)	12 (11-14)	43 (39-47)
p-value		0.909	0.276	0.002**	0.007**	0.007**
Self-reported competency in geriatric care						
Not competent at all	143 (37.0)	7 (6-8)	14 (12-16)	9 (6-13)	12 (11-14)	42 (39-47)
Somewhat/highly competent	243 (62.9)	7 (6-8)	14 (11-16)	9 (6-13)	12 (10-14)	42 (38-47)
p-value		0.193	0.589	0.939	0.328	0.301
Educators' experience in geriatric care						
Don't know	225 (58.2)	7 (6-8)	14 (11-17)	9 (6-12)	12 (11-14)	42 (38.5-47)
Yes	100 (25.9)	7 (6-8)	14 (12-16)	8 (6-13)	11 (9.25-14)	42 (38-47)
No	61 (15.8)	6 (5-8)	14 (12-15)	11 (6-15.5)	12 (10-14)	42 (38.5-46)
p-value		0.020*	0.338	0.246	0.235	0.821
Presence of geriatrics clinic in training hospital						
Yes	114 (29.5)	7 (6-7)	14 (12-16)	8.5 (5-13)	12 (10-14)	42 (37-46)
No	272 (70.4)	7 (6-8)	14 (11.25-16)	10 (7-13)	12 (11-14)	43 (39-47)
p-value		0.535	0.897	0.100	0.547	0.120
Attendance at conferences/courses						
Never attendance	247 (63.9)	7 (6-8)	14 (11-16)	10 (7-13)	12 (10-14)	42 (38-47)
≥1time attendance	139 (36.0)	7 (6-8)	14 (12-16)	9 (6-13)	12 (10-14)	42 (38-48)
p-value		0.877	0.901	0.593	0.692	0.815
Interest in future geriatric care practice						
Undecided	157 (40.6)	7 (6-8)	14 (12-16)	8 (5.50-13)	12 (11-14)	42 (38-47)
Yes	170 (44.0)	7 (6-7)	14 (11-16)	12 (7-13)	12 (10-14)	42 (39-47)
No	59 (15.2)	7 (6-8)	15 (12-17)	8 (6-12)	11 (9-14)	42 (38-46)
p-value		0.513	0.244	0.026**	0.376	0.774

*Values are presented as median (IQR). UCLA-GAS: University of California, Los Angeles Geriatrics Attitudes Scale. **p<0.01, *p<0.05. p-values were calculated using Mann-Whitney U test for two groups and Kruskal-Wallis test for three or more groups.

DISCUSSION

In an aging society, the attitudes of physicians who will work in primary healthcare services towards the elderly are critical in terms of the quality of healthcare services in general and elderly care in particular. Our findings, in line with comparable studies in the literature (4,5,13,14), indicate that FM residents have a neutral-to-mildly positive attitude towards the elderly. Medical, nursing, and pharmacy students demonstrated neutral to positive attitudes as measured by the UCLA-GAS (8,15–17). Similar findings were reported in studies using different assessment scales to evaluate healthcare professionals' attitudes toward the elderly(18–20).

Findings in the literature regarding the effect of physicians' age on their attitudes towards the elderly vary (11,18,20,21). Although we did not find a significant relationship between residents’ age and UCLA-GAS scores, studies in the literature generally found that younger physicians had higher scores (4,5). However, the mean age of the samples in these studies is higher than our sample. The more positive attitudes of young physicians may be attributed to the increasing importance of geriatrics education in recent years and the increase in geriatrics education in medical school and residency curricula. On the other hand, the fact that we did not find a significant relationship between the age and their scores can be attributed to the fact that the mean age of our sample was under 30 years old, and their ages were close to each other. Several other studies featuring multifactorial analyses have shown that physicians' UCLA-GAS scores increased with their age (4,22). As stated by Samra et al., in many studies, the effect of age has not been evaluated with multifactorial analysis, and there is no consensus on how physicians' knowledge and working experience in geriatric care is correlated with their age (23).

In line with literature data (5,11,12,18,21,24), we did not find a significant relationship between gender and UCLA-GAS scores. Samra et al. stated in their metanalysis that 18 of the 28 studies investigating physicians' attitudes towards the elderly did not find a significant relationship between the physicians’ gender and scores (23). Studies in the literature generally reported that female physicians have more positive attitudes towards the elderly than male physicians (4,15–17,25). Among the relevant studies conducted in our country, the studies that found that female physicians had a more positive attitude towards the elderly attributed this finding to the fact that men are more visible in working life in accordance with Turkish culture, women spend more time at home, and women take a greater role in the care of family members (26,27). However, these reasons are not explanatory for situations where both genders are equally involved in working life, as in our sample. Therefore, it is likely that there are additional factors affecting the relationship between physicians' gender and attitudes towards the elderly.

In line with the literature (16,20,21,23,28), we did not find a significant relationship between the UCLA-GAS scores and the mean duration the residents had been practicing medicine or the mean duration they had been residents. On the other hand, there are also a few studies that showed a positive relationship between the physicians' attitudes towards the elderly and the mean duration the residents had been practicing medicine or the mean duration they had been residents, where this finding was attributed to the fact that these durations reflect physicians' experience (4,29). However, it is also important how physicians communicated with the elderly during these timeframes and under what conditions they encountered them. Mihevc et al. stated that in an aging society, health sciences students need to become professionals in geriatric care in terms of knowledge, skills, attitudes, and values (30). Several studies evaluating the effect of the education received by individuals from various professions on their attitudes have revealed that education increases positive attitudes (11,13–15,24,25,28,31). However, there are also studies reporting that education has a negative relationship (18,21,32). Similarly, in parallel with several other studies (5,15,31), we found that residents who did not receive structured geriatrics education as part of their FM residency had significantly more positive attitudes towards elderly people than those who did. It is controversial how education is reflected in behavior. As a matter of fact, Samra et al. stated that half of the intervention studies they examined within the scope of their meta-analysis reported that education had a positive effect on attitudes, while the other half reported that it did not have a positive impact and therefore concluded that knowledge-based interventions had no effect on their attitudes (23). Similarly, an intervention study conducted with internal medicine residents found that a 4-week structured geriatric education program increased their knowledge but did not impact their UCLA-GAS scores (33). Ayrancı, on the other hand, found a decrease in the UCLA-GAS scores of medical school students as their grade levels increased (15). These differences between studies on the impact of education on attitudes have been attributed to the varying vulnerabilities of the elderly people contacted by physicians (11,21,31). Another reason education does not positively affect attitudes towards the elderly may be that as doctors' experience increases, they begin to perceive patients/diseases as more ordinary. A study conducted in Poland concluded that, in the long run, the excessive professional burden placed on nurses as their knowledge levels increase may negatively affect their attitudes by leading to difficult working conditions and job burnout (34).

Samra et al., stated that interventions do not affect attitudes, regardless of their type and duration, except for those with empathy content, which positively affects attitudes towards the elderly (23,35). The number of studies conducted in our country investigating the effect of family physicians' empathy on their attitudes towards the elderly is limited. One of these studies found that family physicians with high levels of empathy working in Izmir had positive attitudes towards the elderly (29). These findings are guiding for empathy-based intervention studies.

Increasing the opportunities to encounter the elderly in the workplace can facilitate the transformation of knowledge into behavior. A study from Spain found that increasing nursing students' knowledge level did not change their attitudes, but increasing their opportunities to contact the elderly positively affected their attitudes, independent of other factors (36). Field training varies greatly among educational institutions with the elderly. In fact, we found that the participants in our study did not and will not take enough roles in institutions and services (T-FHCs, medical homes, palliative care services, family health centers, etc.) that can provide opportunities for contact with the elderly within the scope of field training. The fact that most of the residency training in our country takes place in tertiary hospitals, that the medical departments that provide residency training do not have inpatient services, and that the elderly apply to disease-specific specialty polyclinics for their diseases reduces the opportunity for residents to encounter, diagnose and treat the elderly. In addition, problem-oriented treatment of patients with multimorbidity in other clinics reduces the opportunity for residents to be in educational environments where the care and follow-up of elderly people are carried out with a biopsychosocial perspective.

As reported in other studies (13,37), we found that a significant proportion of FM residents did not feel competent in the relevant subjects included in the curriculum. A study from Malaysia concluded that medical school students did not fully acquire basic geriatric competencies due to deficiencies in the number of geriatric specialists and the curriculum (38). Regarding the attitudes of medical students towards the elderly, which has been researched for nearly 50 years, WHO strongly recommends providing well-equipped education and states that good education will improve medical students' perspective on the elderly in the future (24,39). Studies in Malaysia and Australia have shown that medical students' competencies increased with educational intervention (38,40). Even though we did not find a relationship between residents' competencies and their attitudes, the literature findings are important in terms of indicating the topicality of updating the specialty curriculum.

In our study, we observed that faculty members' experience in elderly health services positively influenced residents' attitudes in the social dimension subscale. Studies have shown that the educator's interest in geriatrics and clinical practice experience in geriatrics positively affects the attitude and the provision of quality healthcare services (9,39). Our finding that physicians who stated they would like to work with the elderly in the future had higher compassion subscale scores is consistent with previous studies (12,16,26,28,29,38). The higher medical care and compassion subscale scores of physicians who visit nursing homes may also be attributed to their personal interest in the elderly.

In line with the literature, participants stated that they think geriatrics should be a subspecialty of FM (41,42). Just as there is an increasing emphasis today on the need to provide geriatrics education as a subspecialty of FM, there has been a similar emphasis on providing specialty training in FM in the past. After A. Flexner laid the foundations of medical specialization in 1910, F. Peabody in 1923 emphasized that patients did not know where to go and that there was a need for a medical specialty that provided comprehensive and personalized healthcare services (43). Geriatric health services should be provided in the primary care setting with a community-oriented, individualized, comprehensive, and holistic perspective within the framework of the core principles of FM. From this perspective, this idea may conflict with its core principles and developmental foundations. Therefore, rather than turning geriatrics into a subspecialty, expanding it across medical specialties and closely collaborating with geriatricians during training will positively improve residents' self-confidence and experience in elderly patient management. Beyond increasing their knowledge-based competencies to improve their attitudes and understanding of the needs of the elderly, it is necessary to ensure that they take an active role in the care of the healthy elderly during their specialty training, and to increase geriatrics training provided by experienced academics. Eliminating the lack of knowledge in the field of geriatrics in specialty education and ensuring the transformation of knowledge into practice by revealing the obstacles to gaining experience may positively affect the attitudes of residents. In addition to the unique characteristics and diseases of the elderly, many factors such as the diversity of preventive health services and the need to frequently refer to other disciplines, and the characteristics of communication with the elderly can lead to complex emotions in geriatrics education. Periodic intervention studies that address geriatric experience and the quality of elderly healthcare services are valuable in terms of evaluating attitudes and identifying their geriatric education needs.

Limitations of the Study: The study's cross-sectional design constitutes the study's primary limitation in that it makes it difficult to establish a causal relationship. Secondly, the researcher-generated questions may have created potential bias. Thirdly, the fact that geriatric training in our country is not standardized in terms of quality and quantity and that we did not assess residents’ level of knowledge with objective tools may have led to the heterogeneity of the groups. Lastly, although our overall sample had sufficient representative power according to the power analysis we conducted before the study, the representative power of the groups compared within the scope of subgroup analyses may not have been as sufficient.

CONCLUSIONS

The findings of this study revealed that the FM residents’ attitudes towards the elderly were neutral-to-slightly positive. The factors affecting attitudes towards the elderly are quite complex, necessitating long-term intervention studies to understand them better. Enriching and standardizing geriatric content in the FM specialty curriculum, increasing opportunities and experiences in geriatric education may positively impact the attitudes of residents towards the elderly. Thus, while the quality of future primary health care services will increase, interest and attitudes towards the elderly will improve and awareness will increase. Therefore, it is important to identify attitudes towards the elderly and identify training needs in curriculum planning. Considering that the elderly population is gradually increasing in the world and in our country, it is very important to improve the positive attitudes of primary care physicians, to whom the elderly first apply for health care, towards the elderly, for their healthy and successful aging.

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RESEARCH ARTICLE

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Infectious Epidemic Diseases in National and International Disaster Risk Reduction Strategies: A Comparative Analysis of Türkiye's Disaster Risk Reduction Plan (TARAP) and International Policy Frameworks

ABSTRACT

Objective: This study aims to evaluate how infectious epidemics are integrated into national and international disaster risk reduction strategies comparatively. It aims to compare Türkiye's Disaster Risk Reduction Plan (TARAP) with similar policy and strategy documents to reveal strengths and areas for development. A comprehensive analysis of the relationship between disaster and health management revealed Türkiye's compliance and differences with international policy frameworks.

Method: The study is based on qualitative comparative analysis. The plans were evaluated under four main headings using a thematic coding method: governance and institutional structure, early warning and digital monitoring systems, public awareness and education policies, and financial resources and operational preparedness levels.

Results: The comparative analysis revealed that TARAP has similarities and differences with other countries national disaster risk reduction strategies regarding integrating infectious epidemics. In the countries examined, strategic priorities such as increasing health system resilience, strengthening early warning and epidemiological monitoring mechanisms, increasing public awareness, and encouraging intersectoral cooperation are emphasized. Especially after the COVID-19 pandemic, countries have placed epidemics at the center of their disaster policies; they have prioritized digital epidemiological surveillance systems and effective risk communication strategies. TARAP aligns with international trends by classifying epidemics as a type of disaster. However, the lack of detailed planning in implementing post-disaster digital early warning systems and operational resource allocation continues.

Conclusions: Integrating infectious diseases into disaster policies requires multi-sectoral, holistic approaches that include strong health systems, effective public health education, and digital infrastructure investments. Although TARAP is a starting point in managing epidemic risks, it must be developed in digital monitoring, financial planning, and stakeholder coordination.

Keywords: TARAP, Infectious Diseases, Disaster Risk Reduction, Health System Resilience, Disaster Policy.

Ulusal ve Uluslararası Afet Risk Azaltma Planlarında Bulaşıcı Salgın Hastalıklar: Türkiye Afet Risk Azaltma Planı (TARAP) ve Uluslararası Politika Belgeleri Bağlamında Bir Analiz

ÖZET

Amaç: Çalışmanın amacı, bulaşıcı salgın hastalıkların ulusal ve uluslararası afet risk azaltma stratejilerine nasıl entegre edildiğini karşılaştırmalı olarak değerlendirmektir. Türkiye'nin Afet Risk Azaltma Planının (TARAP), benzer politika ve strateji belgeleriyle karşılaştırılarak güçlü yönlerin, geliştirilmesi gereken alanların ortaya çıkarılması hedeflenmektedir. Uluslararası politika çerçeveleriyle Türkiye'nin uyumu ve farklılıklarını ortaya koyarak afet ve sağlık yönetimi arasındaki ilişkiye dair kapsamlı bir analiz yapılmıştır.

Yöntem: Çalışma karşılaştırmalı nitel analize dayanmaktadır. Planlar, tematik kodlama yöntemi kullanılarak dört temel başlık altında değerlendirilmiştir: yönetişim ve kurumsal yapı, erken uyarı ve dijital izleme sistemleri, toplumsal farkındalık ve eğitim politikaları ile finansal kaynak ve operasyonel hazırlık düzeyleri.

Bulgular: Karşılaştırmalı analiz, bulaşıcı salgın hastalıkların entegrasyonu açısından TARAP'ın diğer ülkelerin ulusal afet risk azaltma stratejileriyle arasında benzerlikler ve farklılıklar olduğunu ortaya koymuştur. İncelenen ülkelerde, sağlık sistemi dayanıklılığının artırılması, erken uyarı ve epidemiyolojik izleme mekanizmalarının güçlendirilmesi, kamuoyu farkındalığının artırılması, sektörler arası iş birliğinin teşvik edilmesi gibi stratejik önceliklere vurgu yapılmaktadır. Özellikle COVID-19 pandemisi sonrasında ülkeler, salgın hastalıkları afet politikalarının merkezine yerleştirmiş; dijital epidemiyolojik gözetim sistemlerine, etkili risk iletişim stratejilerine öncelik vermiştir. TARAP, salgın hastalıkları afet türü olarak sınıflandırarak uluslararası eğilimlerle uyum göstermektedir. Ancak afet sonrası dijital erken uyarı sistemlerinin uygulanması ve operasyonel kaynak tahsisinde ayrıntılı planlamanın eksikliği sürmektedir.

Sonuç: Bulaşıcı hastalıkların afet politikalarına entegrasyonu, güçlü sağlık sistemleri, etkin halk sağlığı eğitimi ve dijital altyapı yatırımlarını kapsayan çok sektörlü, bütüncül yaklaşımlar gerektirmektedir. TARAP, salgın hastalık risklerinin yönetiminde başlangıç noktası oluştursa da dijital izleme, finansal planlama ve paydaş koordinasyonu alanlarında geliştirilmesi gerekmektedir.

Anahtar Kelimeler: TARAP, Bulaşıcı Hastalıklar, Afet Risk Azaltma, Sağlık Sistemi Dirençliliği, Afet Politikası.

INTRODUCTION

Disasters, which have social, cultural, economic, and psychological effects beyond loss of life and property, can be defined as "natural, technological or human-induced events that cause physical, economic and social losses for the whole society or certain segments of society, that stop or interrupt normal life and human activities, and for which the affected society does not have sufficient capacity to cope." (1). The multidimensional effects of disasters, which are not limited to physical losses, necessitate a holistic approach that focuses not only on intervention against these events but also includes preventive, preparatory, and curative strategies. At this point, disaster management should be considered as an intervention mechanism activated in times of crisis and as a system that covers every life cycle stage. Reducing disasters' social, economic, and psychological repercussions is only possible with an integrated management process covering these four stages. An integrated disaster management system is a broad perspective and management process that starts before the disaster occurs, covering all the processes before, during, and after the disaster. An integrated disaster management system consists of four stages: Preparation, preparedness, response, and recovery (2).

Health crises that occur after disasters go beyond physical destruction and pave the way for secondary disasters that directly threaten public health (3). One of the most common secondary crises during post-disaster periods is the risk of spreading infectious diseases (4,5). Epidemic diseases, especially those that occur after large-scale disasters or are exacerbated by existing conditions, seriously strain public health systems and are considered secondary disasters. The COVID-19 pandemic has fundamentally questioned this approach and revealed that epidemics should be considered a fundamental component of disaster risk reduction strategies. Epidemics are no longer viewed solely as health-related issues. Today, they are considered multi-actor crises that influence not only health systems but also social, economic, and political structures.

Diseases and disease risks in disasters are generally examined in three main stages: impact, post-impact, and recovery. The impact phase (0–4 days) is characterized by immediate rescue efforts and the management of acute injuries, particularly soft tissue infections, along with complications such as hypothermia, dehydration, and heat-related illnesses. The post-impact phase, which spans from day four to approximately four weeks after the disaster, presents increased vulnerability to infectious diseases transmitted through air, water, food, or vectors. Common illnesses during this period include cholera, typhoid, bacterial dysentery, hepatitis A and E, leptospirosis, and viral gastroenteritis (e.g., rotavirus, norovirus). Respiratory infections—both viral (e.g., influenza, RSV, adenoviruses) and bacterial (e.g., Streptococcus pneumoniae, tuberculosis, pertussis, Legionella, Mycoplasma pneumoniae)—also pose serious risks, along with respiratory-borne illnesses such as measles, varicella, and meningococcal disease. Tetanus is another critical concern during this stage due to contaminated wounds and lack of immunization coverage. (4-10). In contrast to the generally accepted three stages, Noji (1997) mentions five phases: inter-disaster, pre-disaster, impact, emergency, and rehabilitation. The first two phases mentioned by Noji (1997) contribute to public health and the prevention of epidemics in terms of disaster risk reduction strategies (11)

One of the most common secondary crises post-disaster periods is the risk of spreading infectious diseases. After a disaster, population displacement, crowding in temporary shelters, interruption of health services, failure to provide hygiene conditions, damage to water and sanitation infrastructure, nutritional deficiencies, vaccination rates, endemic organisms, and disruptions in public health systems may lead to the emergence and spread of epidemics (3,4,8,9,10,12).

The integration of disaster risk management with epidemic control is of critical importance in the context of the United Nations Sustainable Development Goals (SDGs). The SDGs outline 17 primary objectives to promote healthy lives, support economic growth, and ensure environmental sustainability. Epidemic outbreaks following disasters are directly linked to several of these goals, particularly Good Health and Well-being (SDG 3), Clean Water and Sanitation (SDG 6), Sustainable Cities and Communities (SDG 11), Climate Action (SDG 13), and Partnerships for the Goals (SDG 17). Accordingly, incorporating preventive measures against epidemics into disaster risk reduction strategies enhances post-disaster resilience and strengthens the capacity of societies to achieve sustainable development. In this regard, aligning national disaster policies with the SDGs will contribute to the protection of global health and the long-term sustainability of communities (13-18).

The interconnection between infectious diseases and the Sustainable Development Goals (SDGs) highlights the need for integrated and cross-sectoral strategies in disaster risk governance and global health policy. In post-disaster settings, epidemic threats can directly hinder progress on several SDGs by exacerbating existing vulnerabilities and disrupting basic services such as healthcare, water, sanitation, and infrastructure. Understanding these intersections is essential to developing effective and inclusive risk reduction strategies that respond to emergencies and support broader development goals. Table 1 outlines the key points of convergence between infectious diseases and selected SDG targets, emphasizing their mutual implications for sustainable and resilient development.

Table 1. Common Intersections Between Infectious Diseases and the Sustainable Development Goals (SDGs)

SDGs	Sub-Target	Relevance to Infectious Diseases	Connection to Disaster Risk Reduction
Goal 1	1.5	Vulnerable communities are disproportionately	Enhancing resilience is a core disaster policy
Goal 3	3.3 / 3. d	Direct: ending diseases and strengthening health systems	Directly overlaps with disaster resilience goals
Goal 6	6.1 / 6.2	Access to clean water and hygiene reduces infection risks	Water infrastructure is a critical risk area in disasters
Goal 11	11.5 / 11. b	Urban areas increase disease spread risk	Resilient urban planning is essential
Goal 13	13.1	Climate impacts create new disease-prone areas	Requires shared early warning systems
Goal 17	17.6	Sharing of information, technology, and data	Essential for international cooperation in disaster response

* Table created by the authors

The multifaceted nature of infectious diseases and their implications for disaster risk management reveals significant overlaps with the Sustainable Development Goals (SDGs). These intersections are not coincidental but reflect systemic vulnerabilities where health, poverty, urbanization, climate, and global cooperation converge. Integrating infectious disease control into SDG-related policies and disaster strategies is beneficial and essential for ensuring long-term resilience and equitable development.

To illustrate this, Table 2 below presents a cross-sectoral analysis of selected SDGs concerning infectious diseases and disaster risk reduction. It highlights how key targets -such as health system strengthening, access to water and sanitation, urban resilience, and climate adaptation- are deeply intertwined with epidemic risk management. By identifying these convergence points, the table underscores the need for integrated governance approaches that align national disaster frameworks with global development agendas.

Table 2. The Relationship Between Sustainable Development Goals (SDGs), Infectious Diseases, and Disaster Risk Reduction

SDGs	Goal	Relevance to Infectious Diseases	Link to Disaster Risk Reduction	Integrated Thematic Analysis and Conceptual Linkage
1	No Poverty	Vulnerable populations face challenges in accessing healthcare	Fragile groups are more severely affected by disasters	Socioeconomic inequalities reduce resilience to epidemics and disasters; these groups must be prioritized in risk reduction strategies.
3	Good Health and Well-being	Directly targets epidemic control	Health systems play a vital role in disaster response	SDG Targets 3.3 and 3.d explicitly focus on controlling infectious diseases and strengthening healthcare infrastructure.
6	Clean Water and Sanitation	Crucial for preventing waterborne diseases	Infrastructure failures increase epidemic risks post-disaster	Ensuring safe water access during disasters is essential to prevent outbreaks; infrastructure protection is key.
11	Sustainable Cities and Communities	Urban density increases health and hygiene burdens	Cities are highly vulnerable to disasters	SDG Target 11.5 emphasizes reducing disaster-related losses in cities, which inherently includes epidemic-related impacts.
13	Climate Action	Climate change influences vector-borne disease spread	Climate-related disasters are increasing	SDG Target 13.1 calls for resilience to climate-related hazards; epidemic risks must be considered within this context.
17	Partnerships for the Goals	Requires global access to vaccines, treatments, and data	Multilateral coordination is crucial during disasters	Following the pandemic, SDG 17.6 emphasizes the role of scientific and technological cooperation in supporting disaster preparedness and response.

*Table created by the authors based on the review of relevant national and international documents.

Integrating infectious disease dynamics into disaster risk reduction (DRR) frameworks has become a critical component of contemporary resilience strategies. Global policy agendas have shifted towards holistic and anticipatory approaches as health-related emergencies increasingly intersect with environmental, social, and economic vulnerabilities. Sendai Framework for Disaster Risk Reduction (SDFFR, 2015–2030) underscores the necessity of addressing biological hazards—such as epidemics and pandemics—through multisectoral coordination, strengthened health systems, and risk-informed planning processes (18, 19). This paradigm reflects an evolving understanding that infectious diseases are not isolated health events but systemic phenomena with cascading impacts on sustainable development, particularly in the aftermath of disasters. The thematic associations presented in Table 2 offer a structured synthesis of how selected SDGs intersect with epidemic vulnerability and disaster resilience, reinforcing the relevance of integrated policy design in national and international contexts.

SFDRR highlights the importance of integrating health considerations into comprehensive disaster risk management strategies by explicitly addressing biological hazards, including epidemics and pandemics. The framework advocates for a multisectoral approach, emphasizing the need to strengthen healthcare systems, enhance preparedness and response capabilities, and ensure that healthcare infrastructure remains resilient and functional during disasters. SFDRR recognizes infectious diseases as not isolated health crises but systemic risks that significantly affect social, economic, and environmental dimensions, causing cascading effects on sustainable development. In light of this, it broadens the scope of disaster risk reduction to include diverse threats such as environmental, technological, biological, and human-induced hazards. Furthermore, SFDRR calls for improved international cooperation and knowledge-sharing mechanisms to enhance global resilience against health emergencies. Consequently, building robust capacities for the prevention, early detection, timely response, and effective control of epidemic diseases emerges as an indispensable element of contemporary DRR policies, underscoring the intersection between public health preparedness and global disaster governance (18, 20, 21)

The increased frequency and impact of epidemic diseases in the 21st century have highlighted the need for fundamental transformations in disaster management systems. Major epidemics such as SARS, H1N1, Ebola, and, notably, the COVID-19 pandemic have demonstrated the necessity for DRR strategies to encompass biological threats. Against this backdrop, it has become evident that disasters involve multidimensional threats, extending beyond physical damage to include health, economic, social, and psychological impacts. Internationally, the SFDRR has recommended enhancing the resilience of health systems and integrating epidemic risks into disaster policies. This approach has prompted many countries, including the United States, Japan, Germany, and Australia, to develop specific scenarios and response plans for epidemic diseases. In alignment with this global trend, Türkiye has also taken strategic steps by defining objectives and actions against epidemic diseases within its Türkiye Disaster Risk Reduction Plan (TARAP). This study compares Türkiye 's efforts in addressing infectious diseases under TARAP with international examples, thereby evaluating the strengths and areas for development within national disaster policies.

The Role and Importance of Infectious and Epidemic Diseases in National Disaster Risk Reduction Policies: This study adopts a qualitative comparative content analysis approach to examine integrating infectious and epidemic diseases into national DRR strategies. Strategic DRR documents from Türkiye (TARAP) and five benchmark countries—the United States, Japan, Germany, Australia, and Canada—were systematically analyzed using thematic coding techniques**.** The analysis focused on four strategic dimensions: (1) governance and institutional frameworks, (2) early warning and digital surveillance systems, (3) public awareness and education, and (4) financial and operational preparedness. This methodological approach facilitated a structured comparison of national strategies, highlighting policy alignments and divergences, implementation challenges, and exemplary practices in integrating epidemic threats into comprehensive disaster risk governance frameworks.

Including infectious and epidemic disease risks in national and international DRR plans is directly associated with several critical developments and global experiences. This trend was institutionalized with the Sendai Framework for Disaster Risk Reduction (SFDRR) 2015–2030. Yet, the rising global awareness of biological threats had already begun to influence policy shifts before its formal adoption. The outbreaks of SARS (2002–2003), H1N1 (2009), and Ebola (2014) demonstrated that disaster management systems must be equipped to respond not only to natural hazards but also to biological disasters. These events compelled disaster risk governance to adopt a multi-hazard approach (18, 22). The COVID-19 pandemic (2020–...) further underscored the prescience of the SFDRR’s strategic direction (23). In the aftermath of the pandemic, many countries formally introduced “epidemic diseases” as a primary threat in their DRR plans. This section presents a comparative analysis of integrated DRR approaches, including epidemic threats, through selected country examples, specifically assessing

Türkiye's competence in this area. The study provides a qualitative analysis of the TARAP alongside the national DRR strategies of Japan, the United States, Germany, Australia, and Canada. The plans were analyzed in terms of content using thematic coding and compared across four strategic dimensions: governance and institutional structure, early warning and digital surveillance systems, public awareness and education, and financial resources and operational preparedness.

Within the scope of DRR strategies, Japan has developed a range of measures and policies to combat infectious diseases. The primary objective is to establish a health system resilient to infectious disease threats. This system centers on public health functions and provides through Public Health Centers (PHCs) (24). These centers are responsible for surveillance, control, and public communication of infectious diseases (25). The Ministry of Health, Labor, and Welfare (MHLW) is responsible for formulating national-level policies and strategies for preventing and controlling infectious diseases and coordinating health service delivery (26, 27). Operating under the Prime Minister's Office, the Central Disaster Prevention Council is tasked with determining and coordinating overarching strategies related to disaster risk reduction and management (28).

In the United States, national-level preparedness and response plans for epidemic diseases have been developed through the Federal Emergency Management Agency (FEMA) and the Centers for Disease Control and Prevention (CDC). These plans encompass the necessary strategies for preventing, detecting, and controlling epidemics and are implemented in collaboration with state and local governments. Under the leadership of the CDC, the country maintains a scenario-based national pandemic preparedness plan (29).

Australia has established its national DRR strategies through the Australian Emergency Management Committee, and the National Health Emergency Response Plan is currently in effect. The response to infectious diseases is led by the Australian Health Protection Principal Committee, with planning conducted at both the national and state levels. These plans focus on increasing public awareness and strengthening health systems. The country regularly conducts drills in preparation for biological threats (30). In addition, established early warning systems ensure that the public is informed and protected promptly against epidemic threats (31).

In Germany, disaster risk management is coordinated by the Federal Office of Civil Protection and Disaster Assistance (BBK), which operates through scenario-based, pre-prepared response plans (32). Strategies related to infectious diseases are developed and implemented by the Robert Koch Institute (33, 34). Germany's plans aim to enhance coordination at both federal and state levels and strengthen the healthcare system's resilience.

The Ministry of Public Safety coordinates Canada's DRR strategies. Disaster management plans emphasize risk communication and the strengthening of public health infrastructure. The Ministry of Health implements plan for infectious diseases and epidemics integrated into the disaster management system as "public health emergencies" (35).

In Türkiye, the multifaceted impacts of disasters extend beyond physical destruction to disrupt the country's social and economic structure. The TARAP has been developed and implemented to address these threats through comprehensive strategies. Covering the period 2022–2030, TARAP is a national plan that aims to minimize disaster risks. The plan includes 17 objectives, 66 targets, and 227 actions addressing 11 disasters. TARAP addresses the most frequently occurring disaster types in Türkiye—especially earthquakes—through preventive and risk-reducing strategies, offering an integrated approach based on the principles of sustainability and resilience (36).

TARAP does not regard infectious diseases solely as health-related issues but as disaster components that threaten national order. Accordingly, the plan outlines strategic actions such as establishing early warning systems, expanding epidemiological surveillance, and promoting public health education. The key objectives related to infectious and epidemic diseases within TARAP can summarized as follows (36):

- Establishing a resilient health infrastructure
- Expanding epidemiological surveillance systems
- Enhancing public health awareness
- Strengthening risk communication and alert mechanisms
- Supporting institutional and local capacities through education.

From a disaster risk management perspective, infectious and epidemic diseases are complex hazards with social, environmental, and economic consequences that extend well beyond medical interventions. TARAP is a multidisciplinary, preventive, and resilience-oriented approach to these risks and presents a valuable model for national disaster policy and public health systems. Based on the information presented above, Table 3 summarizes how the issue of infectious and epidemic diseases is addressed in the DRR policies of selected countries.

Evaluation of TARAP Actions on Infectious and Epidemic Diseases: As of March 2025, the implementation rate of TARAP, which consists of 227 actions, stands at 59%. Among the 227 actions addressing 11 different types of disasters, 21 actions—accounting for 9.25% of the total—specifically concern infectious and epidemic

Table 3. The position of infectious diseases in the “National Disaster Risk Reduction Strategies” of selected countries

Country	Strategy / Plan	Approach to Epidemics	Coordinating Institution(s)	Explicit Emphasis
Türkiye	Türkiye Disaster Risk Reduction Plan (TARAP)	Epidemics are recognized as a disaster; strategies focus on strengthening the health system, raising public awareness, and establishing early warning systems.	AFAD and Ministry of Health	Clear designation: "Infectious and epidemic diseases are a type of disaster."
Japan	National Disaster Risk Reduction Strategy	Monitoring and intervention through Public Health Centers; emphasis on public health education and early warning systems.	Ministry of Health, Labour and Welfare; Local Authorities	Specific actions and control systems are listed under biological threats.
United States	National Preparedness Framework; CDC Pandemic Preparedness Plan	Epidemics considered within the scope of disasters; plans include national preparedness levels, disease monitoring systems, and logistical capacity planning.	CDC and FEMA	Epidemics are “large-scale public health emergencies” within the disaster category.
Germany	National Risk Management and Health Security Plan	Scenario-based epidemic response plans; strategies aimed at increasing the healthcare system's capacity.	Federal Ministry of Health, BBK	Epidemics are classified as systemic disasters that may lead to the collapse of critical infrastructures.
Australia	National Health Emergency Preparedness Plan	Developed coordination and information-sharing systems for biological threats; epidemics are treated as part of disaster management.	Ministry of Health, Emergency Agencies	Epidemics are officially recognized as “national-level disasters.”
Canada	National Emergency Strategy and Pandemic Plan	Public health threats addressed within disaster preparedness; community-based health education and mobile health services planned.	Public Health Agency of Canada (PHAC)	Pandemics are integrated into the disaster system as “public health emergencies.”

*Table created by the authors based on the review of relevant national documents

diseases. Of these 21 actions, 15 are under the responsibility of the Ministry of Health. One action each falls under the responsibility of AFAD and TÜBİTAK. In contrast, two actions are overseen by the Ministry of Agriculture and Forestry and the Presidency of Strategy and Budget. The actions included in TARAP are structured across three timeframes: short-term (2022–2024), medium-term (2022–2028), and long-term (2022–2030). Among the actions related to infectious and epidemic diseases, five are short-term, 14 are medium-term, and two are long-term. Of the five short-term actions, 80% are completed; among the 14 medium-term actions, 66% are complete; and for the two long-term actions, the completion rate is 37.5%. Five actions have been completed, 13 are ongoing, and three have not been initiated. When assessing the performance of the Ministry of Health within TARAP, it was observed that the completion rate for the 15 actions under its responsibility is 72%. The Ministry has completed four actions, while 11 are still in progress. Table 4 presents detailed information regarding the actions on infectious and epidemic diseases included in TARAP.

Table 4. Performance Indicators of the Actions Included in the TARAP

Target	**Action No**	**Action Description**	**Timeframe**	**Responsible Institution**	**Progress Rate (%)**
H1	B.S.1.1.	Collection of data on infectious and epidemic diseases and integration into a common digital map	Medium Term	AFAD	0
	B.S.1.2.	Preparation of hazard and risk maps for infectious and epidemic diseases	Medium Term	Ministry of Health	40
H2	B.S.2.1.	Defining the roles and responsibilities of ministries, institutions, and organizations in reducing epidemic disease risks	Medium Term	Ministry of Health	40
	B.S.2.2.	Amending legislation for knowledge sharing, human resource development, and institutional responsibility regarding epidemics	Medium Term	Ministry of Health	90
	B.S.2.3.	Enhancing multisectoral health responsibility through intersectoral collaboration	Short Term	Ministry of Health	100
	B.S.2.4.	Providing informational support to local governments on reducing epidemic risks	Medium Term	Ministry of Health	80
	B.S.2.5.	Ensuring coordination and cooperation in the implementation and evaluation of national preparedness plans for epidemics	Medium Term	Ministry of Health	80
	B.S.2.6.	Ensuring coordination in the preparation, implementation, and evaluation of provincial preparedness plans for epidemics	Long Term	Ministry of Health	75
H3	B.S.3.1.	Cooperating with institutions that will provide funding to reduce epidemic risks	Medium Term	Ministry of Health	100
	B.S.3.2.	Prioritizing budget allocation based on epidemic risk levels	Medium Term	Presidency of Strategy and Budget	69
	B.S.3.3.	Providing financial resources for the development of national vaccines and the establishment of production facilities	Medium Term	Ministry of Health	15
	B.S.3.4.	Providing funding for informing the public, producers, and sellers about reducing epidemic risks	Medium Term	Ministry of Agriculture and Forestry	80
	B.S.3.5.	Supporting and conducting projects aimed at preventing infectious diseases	Medium Term	TÜBİTAK	80
	B.S.3.6.	Providing financial resources for the construction and operation of clean water and sewage systems	Short Term	Presidency of Strategy and Budget	0
H4	B.S.4.1.	Establishing tank security systems and warning mechanisms to reduce infection risk in case of water system failure	Long Term	Municipality	0
	B.S.4.2.	Operational risk communication with relevant agencies on cross-border epidemic threats	Medium Term	Ministry of Health	80
	B.S.4.3.	Taking measures at border checkpoints against potentially contagious individuals	Short Term	Ministry of Health	100
	B.S.4.4.	Taking measures at customs against infectious animals, food, water, seeds, etc.	Short Term	Ministry of Agriculture and Forestry	100
	B.S.4.5.	Preparing educational content and plans to raise public awareness on disease prevention	Short Term	Ministry of Health	100
	B.S.4.6.	Operational risk communication with relevant agencies on cross-border epidemic hazards	Medium Term	Ministry of Health	90
	B.S.4.7.	Integration of Early Warning and Response Systems into institutional mechanisms	Medium Term	Ministry of Health	85

The table created by the authors is based on data retrieved from the TARAP document and the official website www.tarap.afad.gov.tr.
** Acronyms for Targets:*
H1: Identification of Hazards and Risks Related to Infectious and Epidemic Diseases and Ensuring Data Sharing and Utilization
H2: Establishing Inter-Institutional Cooperation and Defining Roles and Responsibilities on Epidemic Issues
H3: Ensuring Financial Resources for Reducing Infectious and Epidemic Disease Risks
H4: Enhancing Technical Capacity and Public Awareness Related to Infectious and Epidemic Diseases*

Conclusion and Recommendations

One of the key indicators reflecting a country’s level of development is the frequency of infectious and epidemic diseases. Since such diseases are not confined to the geographic regions they emerge, they constitute a global risk factor. Given these risks, it has become essential for every country to strengthen its health system to respond effectively to potential outbreaks, among the seven global targets of the SFDRR disaster risk management processes. Within this integration process, it is crucial to develop more comprehensive and sustainable strategic plans and policies in the context of disaster risk governance.

Integrating infectious diseases into disaster risk reduction strategies is the key to addressing systemic risks in disaster management. This study identifies best practices for Türkiye by comparatively analyzing how selected countries incorporate epidemic risks into disaster risk reduction strategies. When the national DRR plans of the countries examined are summarized, it is evident that, in the post-Sendai period, epidemics were classified as disaster risks in all cases. In terms of institutional structure, health and disaster management authorities work collaboratively. Regarding public engagement, information dissemination and education are emphasized in all plans. Concerning early warning systems, digital tracking, and early warning mechanisms have become increasingly widespread across these countries in recent years. Among the countries examined, it is notable that local governments play a more active role in Germany and Japan, particularly in Japan, where Public Health Centers carry out widespread field-level interventions. In contrast, digital surveillance and early warning systems appear more comprehensively implemented in the United States and Australia.

As the first disaster risk reduction plan in the history of the Republic of Türkiye, TARAP adopts a holistic approach toward the sources, transmission pathways, prevention strategies, and response methods related to infectious diseases. While TARAP’s infectious disease actions align increasingly with international standards, they remain inadequate regarding digital early warning systems. Additionally, the plan lacks detailed strategies for financing and allocating resources related to these actions. Nonetheless, the fact that TARAP defines infectious diseases as a type of disaster and incorporates a strategic framework with 21 specific actions represents a promising starting point. In the future, it is recommended that TARAP focus on developing digital data monitoring and early warning systems related to infectious and epidemic diseases, enhancing coordination between health and disaster institutions, and systematizing community-based risk communication.

When comparing TARAP with its international counterparts, it was determined that it was prepared comprehensively, addressed the types of disasters separately, and defined specific actions for each type. The publication of TARAP with the Presidential Circular increased its sanction power. Thus, all Ministries follow and implement their actions more professionally against the actions they are responsible for. The quality and quantity of risk reduction plans prepared internationally, especially after COVID-19, regarding infectious and epidemic diseases, have increased. These plans are generally prepared by the authorized institutions responsible for the countries' health, and the number of plans prepared holistically, as in the TARAP example, under the coordination of the institution responsible for disasters and emergencies, is limited. It would be helpful to update and/or revise the actions in TARAP if necessary. Especially considering the requirements of the age, actions can be written on risk reduction, such as conducting hazard and risk analyses related to infectious and epidemic diseases in light of new technologies and governments allocating additional financial resources for this type of disaster.

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RESEARCH ARTICLE

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The Effects of Social Risk Conditions on Pediatric Type 1 Diabetes in Terms of Bibliometric Analysis

ABSTRACT

Objective: This study aims to deeply investigate the literature about effects of deprivation, poverty, inequality, low socioeconomic conditions, and vulnerability factors on pediatric type 1 diabetes using bibliometric analysis methods.

Method: The Web of Science database was searched using keywords. The titles and abstracts of the obtained publications were reviewed by a pediatric endocrinologist regarding their relevance to the intended subject and subjected to a second screening. Performance, co-citation, and co-occurrence analyses were applied to the publications that passed the screening. The analyses used R-based Bibliometrix software, Python, and Microsoft Excel.

Results: Initially, 469 articles were obtained, and after screening, 284 articles were found relevant to the researched subject. The co-citation analysis resulted in three main themes: (1) Management and Clinical Outcomes of Type 1 Diabetes, (2) Deprivation and Socioeconomic Determinants Related to Type 1 Diabetes, and (3) Cumulative Effects of Socioeconomic and Cultural Factors on the Management and Outcomes of Type 1 Diabetes. Following the co-occurrence analyses, thematic areas such as "Diabetes in Children/Adolescent Populations," "Epidemiological Dimensions of Diabetes," "Diabetes and Quality of Life," "Technological and Insured Solutions Related to Diabetes," "Pediatric Health and Diabetes," "Insulin Application and Glucose Monitoring Strategies," and "The Role of Health Policies in Diabetes Management" were identified.

Conclusions: These findings highlight health policymakers' need to develop more effective and inclusive strategies for socio-economically disadvantaged groups. Moreover, this study provides important data to explore how much emphasis researchers have placed on social determinants of health. This might serve as a basis for understanding how diabetes management and outcomes interact with socioeconomic and cultural factors. Thus, it will also serve as a foundation for awareness and method development at the healthcare provider level.

Keywords: Diabetes, Pediatrics, Social, Deprivation, Disparity, Poverty, Bibliometrics.

Bibliyometrik Analiz Açısından Sosyal Risk Koşullarının Pediatrik Tip 1 Diyabet Üzerine Etkileri

ÖZET

Amaç: Bu çalışma, yoksunluk, yoksulluk, eşitsizlik, düşük sosyo-ekonomik koşullar ve incinebilirlik faktörlerinin Pediatrik Tip 1 diyabet üzerindeki etkilerini bibliyometrik analiz yöntemleri ile derinlemesine incelemeyi amaçlamaktadır.

Yöntem: Web of Science veri tabanı anahtar sözcükler kullanılarak taranmıştır. Elde edilen yayınların başlıkları ve özetleri amaçlanan konuyla ilişkisi açısından çocuk endokrinolojisi uzmanı tarafından gözden geçirilerek ikinci bir elemeye tabi tutulmuştur. Elemeden geçen yayınlar üzerinden performans analizleri, co-citation, co-occurrence analizleri uygulanmıştır. Analizler, R tabanlı Bibliometrix yazılımı, Python ve Microsoft Excel kullanılarak yapılmıştır.

Bulgular: İlk taramada 469 sayıda makale elde edilmiş, elemeden sonra 284 makale araştırılan konuyla ilişkili bulunmuştur. Ortak atıf analizinin sonucunda üç ana temaya ulaşılmıştır: (1) Tip 1 Diyabet Yönetimi ve Klinik Sonuçlar, (2) Tip 1 Diyabetle İlgili Yoksunluk ve Sosyo-Ekonomik Determinantlar ve (3) Sosyo-Ekonomik ve Kültürel Faktörlerin Tip 1 Diyabet Yönetimi ve Sonuçları Üzerine Kümülatif Etkileri. Co-Occurrence analizlerinin ardından, "Diyabet ve Çocuk/Ergen Popülasyonları," "Diyabetin Epidemiyolojik Boyutları," "Diyabet ve Yaşam Kalitesi," "Diyabetle İlgili Teknolojik ve Sigortalı Çözümler," "Pediyatrik Sağlık ve Diyabet," "İnsülin Uygulama ve Glukoz Monitörleme Stratejileri" ve "Diyabet Yönetiminde Sağlık Politikalarının Rolü" gibi tematik alanlar belirlenmiştir.

Sonuç: Bu bulgular, sağlık politika yapıcılar için, özellikle sosyo-ekonomik dezavantajlı gruplara yönelik daha etkin ve kapsayıcı stratejiler geliştirilmesi gerekliliğini ortaya koymaktadır. Ayrıca, bu çalışma, diyabet yönetimi ve sonuçlarının sosyo-ekonomik ve kültürel faktörlerle nasıl etkileşime girdiğini anlamada önemli bir temel oluşturmaktadır. Bu nedenle sağlık hizmetini verenler düzeyinde de farkındalık ve yöntem geliştirme açısından dayanak oluşturacaktır.

Anahtar Kelimeler: Diyabet, Pediatri, Sosyal, Yoksunluk, Eşitsizlik,Yoksulluk, Düşük Bibliyometri.

INTRODUCTION

According to the Diabetes Atlas 2021 data, 537 million adults aged 20-79 live with diabetes, accounting for 1 in 10 adults. This number is projected to increase to 643 million by 2030 and 783 million by 2045. More than three-quarters of adults with diabetes reside in low- and middle-income countries. In 2021, diabetes was responsible for 6.7 million deaths, equating to one death every 5 seconds, and caused a minimum of USD 966 billion in health expenditure, marking a 316% increase over the past 15 years. Furthermore, Type 1 diabetes affects over 1 million children aged 0-18 years (1-3). 1.52 million of the 8.75 million people living with type 1 diabetes around the world in 2022 are less than 20 years old (1). Effective management of diabetes reflects long-term health outcomes at a societal level. However, the management and outcomes of diabetes are closely linked not only to biological factors but also to socioeconomic and cultural factors. These factors can significantly influence the challenges and outcomes faced in diabetes management (4).

Socioeconomic factors in diabetes management play a crucial role in patients' access to treatment, adherence to treatment, and overall outcomes (5). For example, individuals with low socioeconomic status may have less access to insulin treatment options and technological support, leading to increased HbA1c levels as well as diabetes complications.

Similarly, cultural factors can also impact diabetes management. Ethnic background, cultural beliefs, and traditions can influence diabetes treatment and dietary habits (6-7). Therefore, cultural sensitivity and patient education are very important in diabetes management.

Deprivation, Poverty, Inequality, Low Socioeconomic Conditions, and Vulnerability (DPLSEV) factors deeply affect the management and outcomes of Type 1 diabetes. Particularly, individuals with low socioeconomic status may struggle due to limited access to appropriate treatment and technology, leading to increased HbA1c levels and difficulties in managing diabetes complications. Additionally, these factors can exacerbate inequalities associated with diabetes, especially among different ethnic and racial groups. Poverty and low socioeconomic conditions have a definitive impact on long-term health outcomes, further complicating the long-term management of diabetes. Consequently, understanding and addressing inequalities in access to treatment and outcomes highlighted by DPLSEV factors is imperative.

This study aims to thoroughly investigate the literature related to the effects of DPLSEV factors on Type 1 diabetes using bibliometric analysis methods.

1. Who are the most prolific authors, most cited journals, institutions, countries, and trending topics in the DPLSEV field? What are the most cited articles?
2. What are the critical classic studies in the DPLSEV field? What dynamics are involved in the evolution of the field's intellectual structure?
3. Can the conceptual structure of the DPLSEV field be determined?

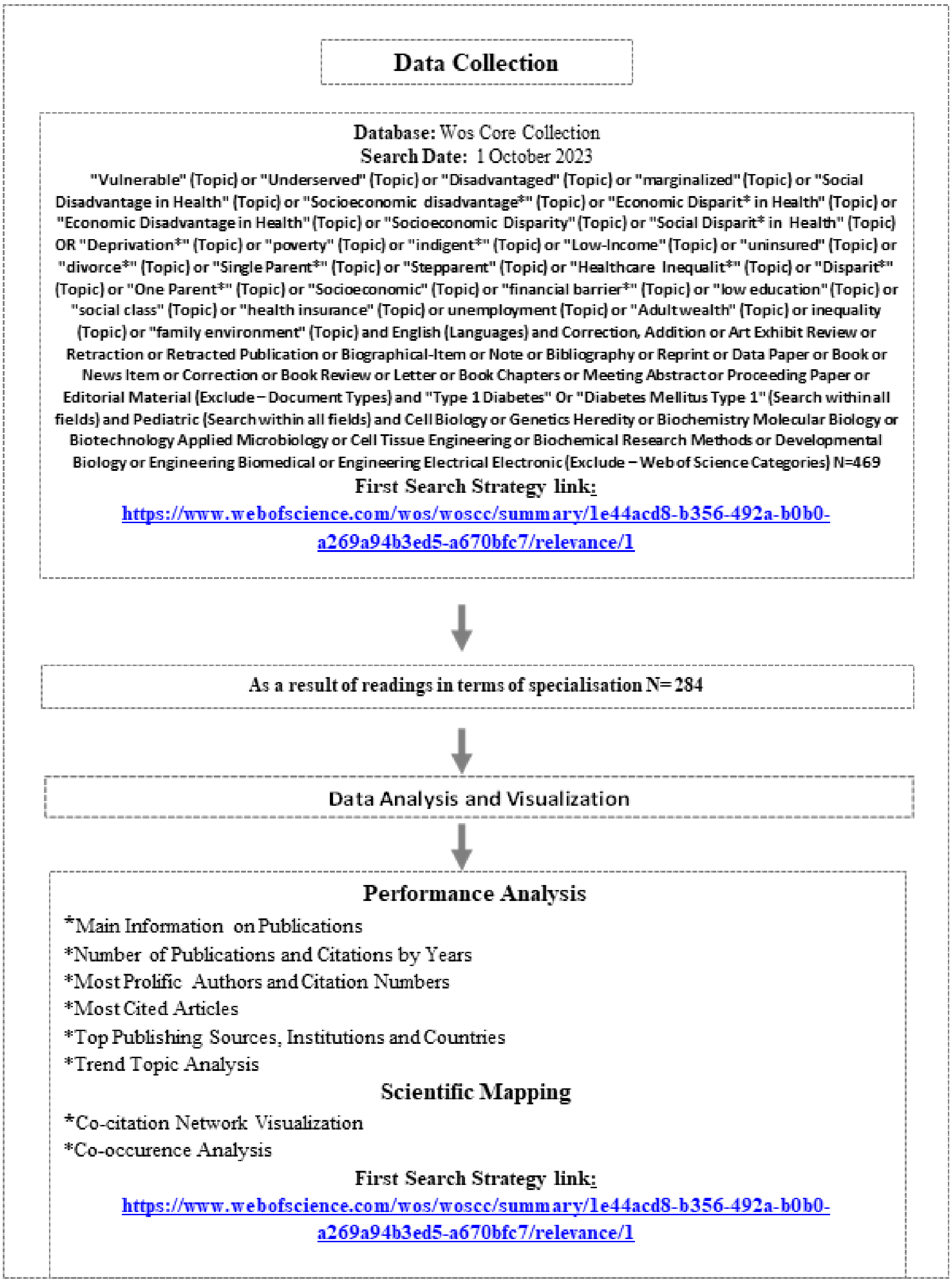
Bibliometric analysis is a valuable tool for deeply understanding high-volume data, revealing connections between publications in a field, discovering new research directions and building a robust foundation for the field. These analyses are particularly helpful in identifying current gaps in a field and developing new concepts. In academic circles, they are frequently used to evaluate article and journal performances, define collaboration networks, and detect trends in a field (8).

This research contributes to the literature in two main ways. Firstly, the inaugural study focuses on Type 1 Diabetes from a DPLSEV perspective. Secondly, through bibliometric and thematic analysis, we have provided valuable insights into the themes of co-citation analysis and co-occurrence of keyword analysis in the DPLSEV field. This aids in identifying research questions that will guide future studies. Additionally, we have generated numerous future research questions within both analyses.

MATERIAL AND METHODS

This study chose the Web of Science (WoS) database for bibliometric analysis. Scientists often prefer WoS for its detailed records; data sets suitable for bibliometric analysis, and the indexing of prestigious publications. Additionally, this database is one of the most frequently utilized sources for bibliometric analysis (9-10). WoS has a comprehensive collection that includes bibliographic lists, citation networks, and an array of full-text articles. Figure 1 illustrates the complete workflow of the analysis conducted.

On October 1, 2023, a search was conducted in the Web of Science (WoS) database for publications related to the effects of social conditions on childhood Type 1 Diabetes using 29 search terms as topics. Subsequently, only English-language articles were selected from the resulting dataset. Publication types such as Correction, Addition or Art Exhibit Review, Retraction, Retracted Publication, Biographical-Item, Note, Bibliography, Reprint, Data Paper, Book, News Item, Book Review, Letter, Book Chapters, Meeting Abstract, Proceeding Paper, and Editorial Material were excluded, ensuring that only articles, reviews, and early access publications were included. In the next phase, raw data were refined to include only articles containing the terms "Type 1 Diabetes" or "Diabetes Mellitus Type 1", and in the final stage, only the Pediatric patient group was selected.



Data Collection

Database: Wos Core Collection
Search Date: 1 October 2023

"Vulnerable" (Topic) or "Underserved" (Topic) or "Disadvantaged" (Topic) or "marginalized" (Topic) or "Social Disadvantage in Health" (Topic) or "Socioeconomic disadvantage*" (Topic) or "Economic Disparit* in Health" (Topic) or "Economic Disadvantage in Health" (Topic) or "Socioeconomic Disparity" (Topic) or "Social Disparit* in Health" (Topic) OR "Deprivation*" (Topic) or "poverty" (Topic) or "indigent*" (Topic) or "Low-Income" (Topic) or "uninsured" (Topic) or "divorce*" (Topic) or "Single Parent*" (Topic) or "Stepparent" (Topic) or "Healthcare Inequalit*" (Topic) or "Disparit*" (Topic) or "One Parent*" (Topic) or "Socioeconomic" (Topic) or "financial barrier*" (Topic) or "low education" (Topic) or "social class" (Topic) or "health insurance" (Topic) or unemployment (Topic) or "Adult wealth" (Topic) or inequality (Topic) or "family environment" (Topic) and English (Languages) and Correction, Addition or Art Exhibit Review or Retraction or Retracted Publication or Biographical-Item or Note or Bibliography or Reprint or Data Paper or Book or News Item or Correction or Book Review or Letter or Book Chapters or Meeting Abstract or Proceeding Paper or Editorial Material (Exclude – Document Types) and "Type 1 Diabetes" Or "Diabetes Mellitus Type 1" (Search within all fields) and Pediatric (Search within all fields) and Cell Biology or Genetics Heredity or Biochemistry Molecular Biology or Biotechnology Applied Microbiology or Cell Tissue Engineering or Biochemical Research Methods or Developmental Biology or Engineering Biomedical or Engineering Electrical Electronic (Exclude – Web of Science Categories) N=469

First Search Strategy link:
https://www.webofscience.com/wos/woscc/summary/1e44acd8-b356-492a-b0b0-a269a94b3ed5-a670bfc7/relevance/1

As a result of readings in terms of specialisation N=284

Data Analysis and Visualization

Performance Analysis

*Main Information on Publications
*Number of Publications and Citations by Years
*Most Prolific Authors and Citation Numbers
*Most Cited Articles
*Top Publishing Sources, Institutions and Countries
*Trend Topic Analysis

Scientific Mapping

*Co-citation Network Visualization
*Co-occurence Analysis

First Search Strategy link:
https://www.webofscience.com/wos/woscc/summary/1e44acd8-b356-492a-b0b0-a269a94b3ed5-a670bfc7/relevance/1

Figure 1. Flowchart of Data Collection, Data Analysis, and Data Visualization

Nevertheless, data from disciplines such as "Cell Biology, Genetics Heredity, Biochemistry Molecular Biology, Biotechnology Applied Microbiology, Cell Tissue Engineering, Biochemical Research Methods, Developmental Biology, Engineering Biomedical, Engineering Electrical Electronic" were excluded. This refinement process resulted in a dataset of 469 articles. In the second phase, abstracts, where two experts read the necessary full texts of these 469 articles to exclude those not covering social risk conditions, prepare the data for bibliometric analysis.

Visual mapping analyses were conducted on the final set of 284 publications using R-based, open-source Bibliometrix software (11-14). A performance analysis, including basic statistics, authors, publication numbers, journals, institutions, and countries, was initially conducted. Subsequently, a scientific map was created, encompassing co-citation networks, co-occurrence, and co-author analyses. The analysis was conducted without word consolidation. In the final stage, article abstracts and titles were scanned to determine the themes addressed by each health accreditation organization.

RESULTS

The findings section comprises performance analyses and scientific mapping analyses. Performance Analyses include key information, publication and citation counts by year, top publishing institutions, journals, and countries, corresponding author analysis, and the top ten most-cited articles.

Timespan
2001:2023

Sources
94

Documents
284

Annual Growth Rate
13.1 %

Authors
1516

Authors of single-authored docs
4

International Co-Authorship
17.96 %

Co-Authors per Doc
7.03

Author's Keywords (DE)
534

References
7078

Document Average Age
5.65

Average citations per doc
18.61

Figure 2. Main Information

Figure 2 summarizes scientific studies conducted between 2001 and 2023 on conditions affecting Type 1 diabetes. Initially, we observed 284 documents on this topic from 94 different sources. The annual growth rate reflecting the dynamic developments in the health sector and increasing interest is 13,1%. Additionally, the average age of the documents is 5.65 years, with an average of 18.61 citations per document, indicating a significant impact in the field. Keywords are also a crucial source of information. 'Keywords Plus (ID)' and 'Author's Keywords (DE)' are 580 and 534, respectively. This can give an idea of which researchers emphasize topics and which aspects of the research draw more attention. The number of authors is quite high, suggesting that the research topic might require a multidisciplinary approach (15-16). Only four authors have written single-authored articles, reflecting the complexity of the subject and the need for multidisciplinary collaboration. The average co-author number per document is 7.03, and the rate of international collaboration is 17.96%, indicating global interest and collaboration among experts from different countries.

Most document types are research articles ('article' 260 and 'article; early access' 4). Additionally, 20 review articles ('review') might indicate a need for an overview or synthesis in the field. In conclusion, the number and impact of research on conditions affecting Type 1 diabetes have increased over the years. This increase reflects the complexity and importance of the subject, as well as the need for a multidisciplinary and international approach.

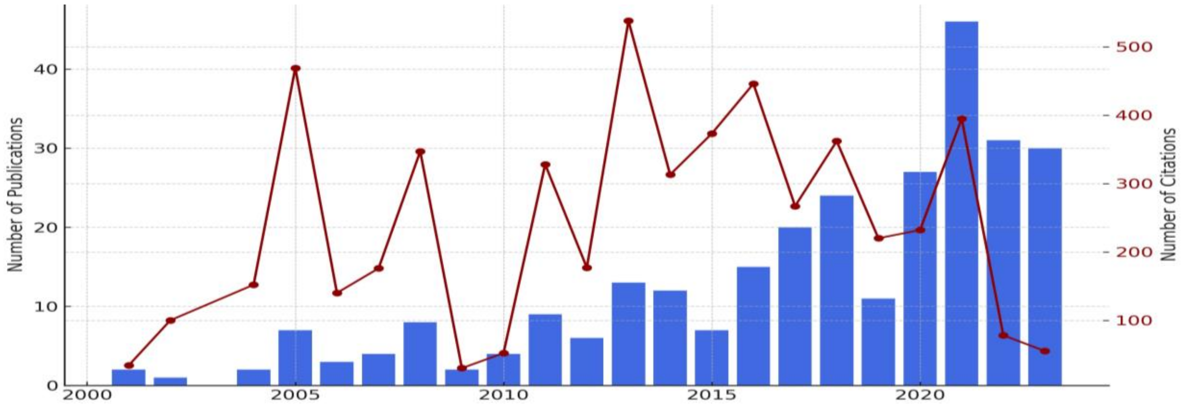
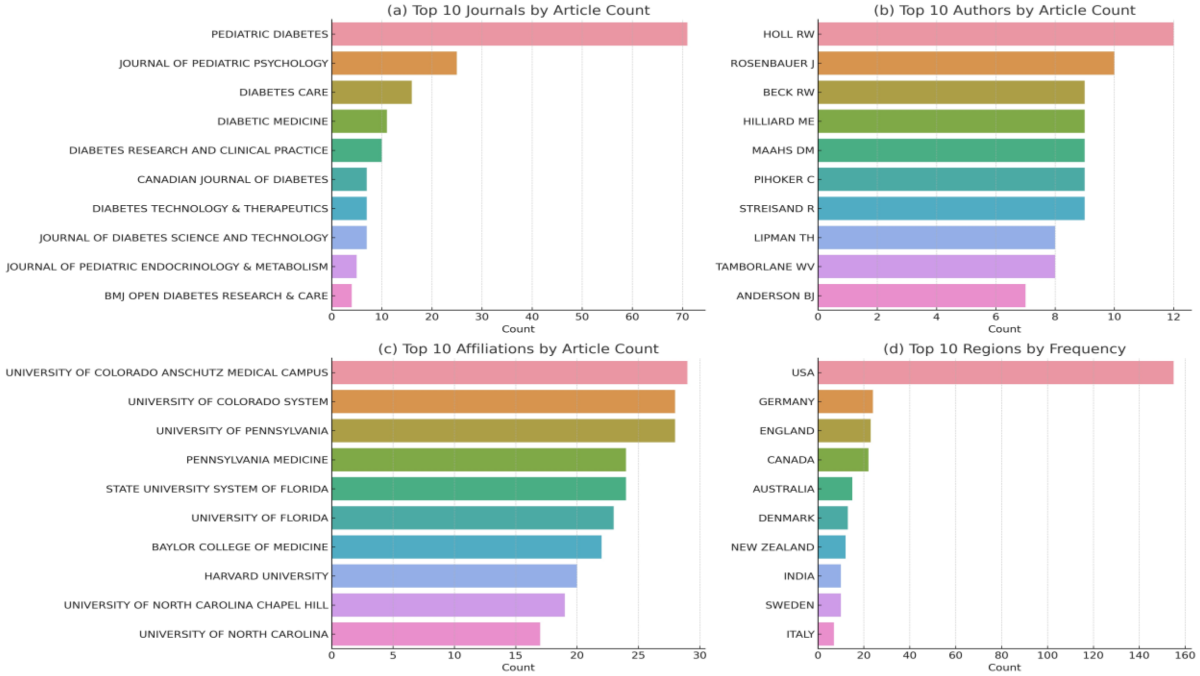


Figure 3. Publication and Citation Counts by Year

Publication and Citation Counts by Year: Analyzing the changes in publication and citation counts over the years reveals several key observations. Firstly, there is a general upward trend in the number of publications, with the most significant increase occurring in 2021 with 46 publications. However, it is noteworthy that there has been a slight decline in 2022 and 2023. This may indicate that while there is a general rise in research activities and academic interest in the field over time, this increase might not be sustainable. Secondly, total citation counts vary by year. Particularly, 2005 and 2013 stand out with higher citation counts than other years.

Conversely, despite increased publication numbers in 2021, 2022, and 2023, the citation counts have remained relatively low. This might suggest that the studies conducted in these years have not yet achieved a wide citation range or sufficient recognition. Finally, there is no automatic correlation between high publication and citation counts. For instance, despite a high number of publications in 2021, the citation count relative to this number remains relatively low. Additionally, it should be considered that new publications often experience a "lag effect." New studies may take some time to receive citations, so the low citation counts observed in recent years could increase.


(a) Top 10 Journals by Article Count

(b) Top 10 Authors by Article Count

(c) Top 10 Affiliations by Article Count

(d) Top 10 Regions by Frequency

Figure 4. Top Publishing Journals, Institutions, Authors, and Countries

Top Publishing Journals, Institutions, Authors, and Countries:

(a) Top 10 Journals with the Most Articles: "Pediatric Diabetes" journal, with 71 articles, holds a dominant position in the field. This indicates that the journal is one of the primary sources in this area of research. The significant gap between this journal and others highlights its importance as a preferred publication medium for researchers in the field.

(b) Top 10 Authors with the Most Articles: "Holl RW" leads with 25 articles. However, the close number of articles among different authors suggests that various contributors actively participate in this field. This scenario underscores the importance of research diversity and varying perspectives.

(c) Top 10 Institutions with the Most Articles: "The University of Colorado Anschutz Medical Campus," with 29 articles, plays a significant role in the sector. However, institutions like the "University of Colorado System" and the "University of Pennsylvania" are notable contributors. This indicates that certain institutions do not monopolize research in this area, but various entities contribute substantially.

(d) Top Publishing Country: The United States, with a frequency of 155, is in a dominant position on a global scale. Germany follows with a frequency of 24. The high frequency for the US indicates its leadership in research in this field. However, significant contributions are also evident from Germany and the United Kingdom.

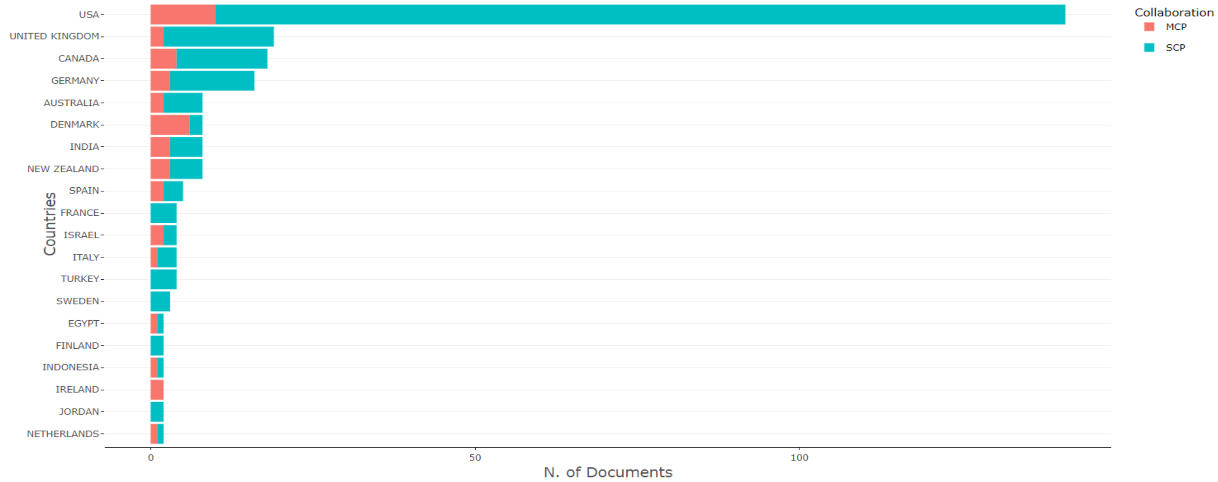


Figure 5. Corresponding Author Analysis

Based on the Multiple Country Publications (MCP) ratio according to the graph: Ireland (100%): All articles from Ireland are written in collaboration with multiple countries. This indicates that Ireland is highly active in international collaborations. Denmark (75%): 75% of Denmark's total publications are written with international cooperation. This high percentage signifies Denmark's active participation in international collaborations. Israel (50%), Egypt (50%), Indonesia (50%), Netherlands (50%), and Switzerland (50%): Half of the articles from these countries are written in collaboration with international partners. This shows significant progress in international cooperation from these countries. New Zealand (37.5%), India (37.5%), and Spain (40%): These countries have an MCP rate above 35%, indicating their commitment to international collaboration, though slightly less active compared to the countries mentioned above. Ireland's 100% rate is particularly noteworthy, highlighting its strong emphasis on international collaboration. However, a high MCP rate does not necessarily mean these countries are superior in scientific fields; it merely indicates their tendency to engage in international collaborations. In summary, countries with an MCP rate of over 50% (Ireland, Denmark, Israel, Egypt, Indonesia, Netherlands, and Switzerland) have made significant strides in international collaboration. This underscores their commitment to valuing and actively participating in global scientific research collaborations.

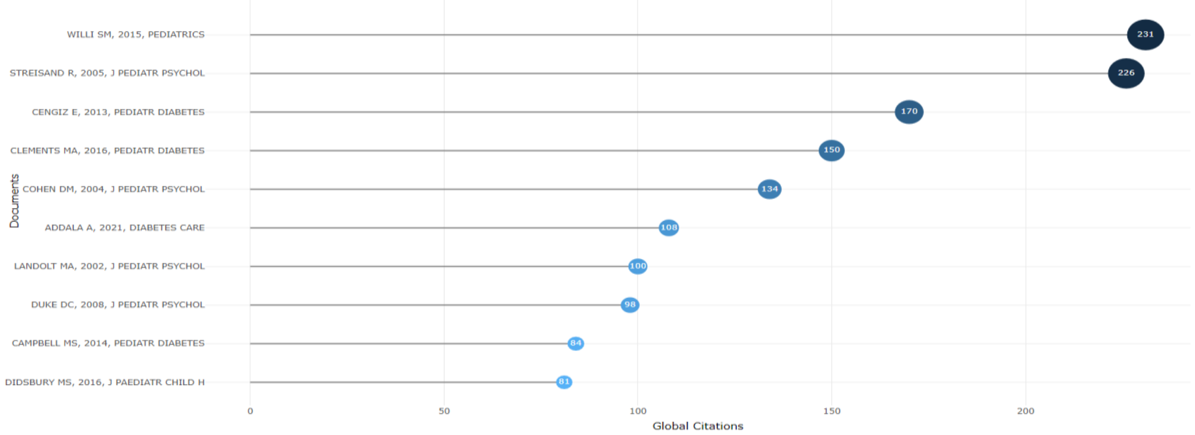


Figure 6. Top 10 Most Cited Studies

The management of Type 1 diabetes and its significant relationships with socioeconomic conditions have been the focus of these studies. Here are the summaries of these articles expressed in a more comprehensible manner:

- Willi et al. (2) examined the effects of racial and ethnic differences among pediatric patients with Type 1 diabetes. Findings indicate that these differences impact critical health outcomes such as access to insulin treatment options, glycemic control, and management of complications.
- Streisand et.al (15) explored the stress experienced by parents of children with Type 1 diabetes. Their study examined the effects of parental stress on children's health outcomes, showing that this stress varies depending on various factors.
- Cengiz and colleagues (16) investigated the frequency of severe hypoglycemia and diabetic ketoacidosis among adolescents with Type 1 diabetes. Findings revealed a correlation between these complications and factors such as ethnicity, economic status, and age.
- Clements et al. (17) studied the changes in Hemoglobin A1c (HbA1c) levels over time in adolescents with Type 1 diabetes. The study showed that glycemic control varies according to age, race/ethnicity, and economic status.
- Cohen et. al (18) found that children from families with low socioeconomic status face challenges in diabetes management and glycemic control, and these challenges are related to family functionality.
- Addala et al. (19) researched the relationship between the socioeconomic status of diabetes patients in the USA and Germany, their use of technology, and HbA1c levels. Their findings indicate that individuals with lower socioeconomic status have lower technology usage and higher HbA1c levels.
- Landolt et. al (20) examined the effects of post-traumatic stress disorder on the mothers and fathers of children newly diagnosed with Type 1 diabetes, showing that these children's parents are psychologically affected.
- Duke et al. (21) conducted a study investigating glycemic control in adolescents with Type 1 diabetes from low socioeconomic families. Their research aimed to assess the predicted and mediating relationships between perceived parental attitudes, CBCL (Child Behavior Checklist Externalizing Subscale) externalizing problem scores, adaptation, and HbA1c levels.

They concluded that adaptation partially mediates between critical parental attitude and HbA1c levels and that critical parental attitude and adaptation mediate between CBCL externalizing problem scores and HbA1c levels. However, CBCL externalizing problem scores did not directly mediate between critical parental attitude and HbA1c. This research contributes to understanding glycemic control in adolescents with Type 1 diabetes in low socioeconomic families. The finding that deprivation and socioeconomic conditions can affect adolescents' diabetes management and health outcomes is significant.

- Campbell et al. (22) compared pediatric Type 1 diabetes management in groups with excellent and poor glycemic control and explained how these differences relate to socioeconomic factors.
- Didsbury and team (23) investigated how the quality of life of children with chronic diseases is affected by socioeconomic factors, finding that children from lower socioeconomic backgrounds have a lower quality of life (23).

An attributive evaluation based on the summaries of these ten authors helps assess the relationship between Type 1 diabetes and deprivation (deficiencies caused by socioeconomic conditions). The studies shed light on the complex links between the treatment and management of Type 1 diabetes and socioeconomic factors, particularly highlighting the following:

- Access Issues: Individuals with lower socioeconomic status may have less access to insulin treatment options and technological support. Addala et al. (19) show that this lack can raise HbA1c levels. Deprivation could be a primary reason for these access issues.
- Stress and Psychological Effects: Streisand and team's (15) study indicates that the stress experienced by parents of children with Type 1 diabetes can negatively impact children's health outcomes. Family economic hardships might be a source of this stress.
- Management of Complications: Campbell et al. (22) compared groups with excellent and poor glycemic control, addressing the impact of socioeconomic factors on glycemic control. Individuals with lower socioeconomic status are likely to face more complications due to poor glycemic control.
- Quality of Life: Didsbury et al. (23) found that children from lower socioeconomic backgrounds have a lower quality of life. The management and treatment of Type 1 diabetes, when combined with deprivation, can further negatively impact quality of life.

Together, these studies indicate that deprivation can lead to adverse effects on the lives of individuals with Type 1 diabetes, and these effects reflect on health outcomes. Ensuring greater support and resource access for individuals with lower socioeconomic status could be crucial for diabetes management and health outcomes. Therefore, health policies and interventions should aim to reduce socioeconomic inequalities and assist individuals with Type 1 diabetes in achieving a better quality of life.

Scientific Mapping: In this section, co-citation and co-occurrence analyses have been conducted. Utilizing the prominent color clusters, each color has been named, and topics related to accreditation organizations in health services have been explored in terms of the intellectual structure, conceptual framework, and collaboration patterns of articles working on accreditation.

Co-citation Analyses

Red Cluster: Under the theme of "Type 1 Diabetes Management and Outcomes," various sub-themes can gain different meanings in the context of socioeconomic variables and deprivation. The impact of diabetes technology, especially considering its high cost, maybe more accessible for pediatric patients with better economic status (20). This situation could create significant differences in treatment and outcomes for children from economically disadvantaged families.

Insulin pump therapy is also typically a high-cost method (24-25). This can pose a significant access barrier for socio-economically disadvantaged groups. Similarly, continuous glucose monitoring systems can be expensive, limiting accessibility in deprived communities (26).

In the context of the relationship between COVID-19 and diabetes, socioeconomic factors and deprivation can also be decisive in hospitalization and mortality rates (27). Particularly, individuals living in high-risk areas with low income might face challenges in accessing healthcare services. Changes in HbA1c among young participants could also vary depending on the quality of education and social support systems, often less accessible in poor communities (17). Themes like social determinants and diabetes, psychological care, and ISPAD guidelines can further deepen pre-existing socioeconomic inequalities. For example, the lack or poor quality of psychological support can negatively affect diabetes management in individuals with low socioeconomic status (28,29).

In conclusion, when considering socioeconomic variables and deprivation under the theme of "Type 1 Diabetes Management and Outcomes," significant inequalities can arise between different groups. Accessibility, effectiveness, and quality can vary depending on socioeconomic status, necessitating health policies and practices to consider these factors.

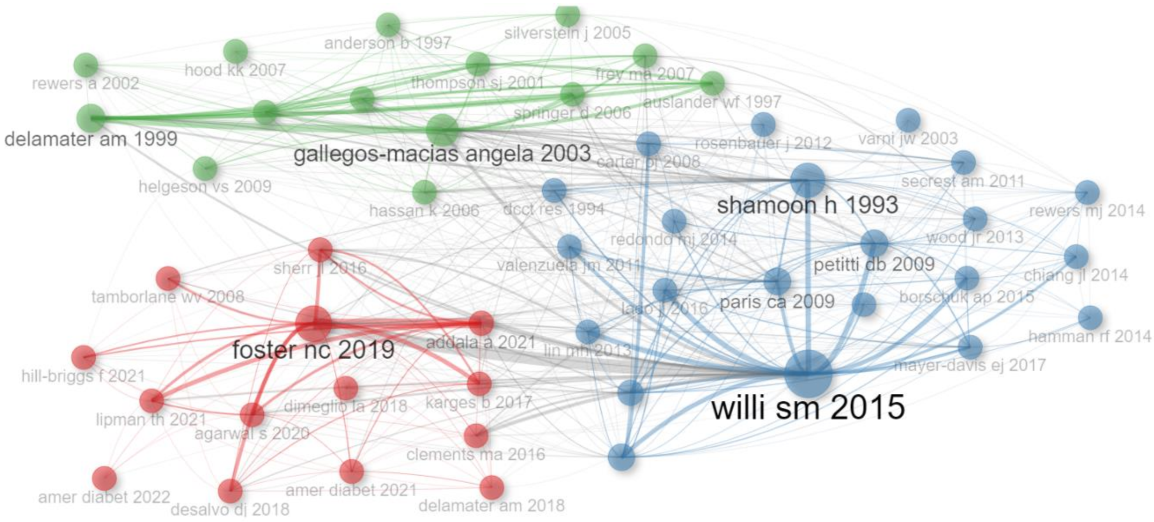


Figure 7. Co-citation Analysis

Green Cluster: "Type 1 Diabetes, Deprivation, and Socioeconomic Determinants" theme offers a multi-layered perspective on socioeconomic variables and deprivation. Studies examining the relationships between ethnic identity and glycemic control highlight the influence of socioeconomic factors and cultural elements on diabetes management (30,31). Economic and social disparities among ethnic groups can be decisive for glycemic control, necessitating interventions in areas where these groups are deprived.

Studies on socioeconomic status and diabetes management particularly show that factors like depression and quality of life are linked to economic status (32,33). A lower socioeconomic status can lead to higher rates of depression and, consequently, poorer levels of glycemic control.

Research on family involvement and diabetes management also reveals how family structure and dynamics, combined with socioeconomic status, affect diabetes management in children and adolescents (6,7). For instance, in low-income families, children's diabetes management might suffer due to the working hours of family members or lack of education.

Long-term prediction of metabolic control and family structure indicate that deprivation and socioeconomic factors can also be decisive for long-term health outcomes (34-36). For example, single-parent families may face more economic burdens, potentially leading to challenges in managing children's diabetes.

Blue Cluster: "The Effects of Socioeconomic and Cultural Factors on the Management and Outcomes of Type 1 Diabetes": Type 1 diabetes is a chronic condition requiring lifelong commitment to treatment and management. However, during this challenging process, patients and healthcare providers grapple with biological, socioeconomic, and cultural factors. This section addresses the overarching theme, "The Effects of Socioeconomic and Cultural Factors on the Management and Outcomes of Type 1 Diabetes," encompassing sub-themes such as ethnic and racial factors, socioeconomic status, access to treatment, health policies, quality of life, and psycho-social factors.

The Role of Ethnic and Racial Factors: Ethnic and racial factors significantly manage type 1 diabetes. Studies by Willi et al. (2) and Lado et al. (3) demonstrate varying dynamics in the treatment and outcomes of diabetes among different ethnic and racial groups. These interactions highlight the need for health policies to be specific to ethnic and racial groups.

The Impact of Socioeconomic Status: Socioeconomic status significantly affects diabetes treatment and the management of complications. Research by Lin et al. (5) indicates that lower socioeconomic status limits access to technological treatment methods.

Access to Treatment and Health Policies: Socioeconomic status directly impacts access to treatment. Chiang et al. (37) noted that socioeconomic factors shape health policies. Policies such as financial support or payment plans must be developed for lower socioeconomic groups.

Quality of Life and Psycho-Social Factors: Finally, as highlighted by Varni et al. (38) deprivation and low socioeconomic status adversely affect the psychological well-being of patients and their families, reducing treatment adherence and quality of life.

Co-Occurrence Analysis: Co-occurrence analyses are a powerful tool for exploring themes within data and potential explanations regarding deficiencies and deprivation in socioeconomic conditions related to type 1 diabetes.

- Red Cluster (Cluster 1) - Adolescent Diabetes and Epidemiology: Keywords include adolescent, diabetes mellitus, child, type 1, and epidemiology. This cluster focuses on the epidemiological aspects of type 1 diabetes in "adolescents" and "children." The term "epidemiology" emphasizes the prevalence and distribution of diabetes in these age groups. In terms of social risk factors, poverty, and low socioeconomic status may significantly impact the management and diagnosis of diabetes among adolescents and children. This cluster examines how the young population copes with diabetes and the role of social factors in this process.

- Purple Cluster (Cluster 2) - Childhood Diabetes Management and Quality of Life: Keywords include diabetes, children, adolescents, type 1 diabetes mellitus, and glycemic control. This cluster brings together "children" and "adolescents" with "type 1 diabetes mellitus" and "glycemic control." The theme addresses the impacts of diabetes on children and adolescents and its reflections on quality of life. Within social risk factors, disparities in access to healthcare services and economic difficulties are highlighted in their effects on diabetes management and glycemic control.
- Green Cluster (Cluster 3) - Access to Healthcare Services and Diabetes Technology: Keywords include pediatric type 1 diabetes and diabetes technology. This cluster contains "pediatric type 1 diabetes" and "diabetes technology." The theme focuses on access to health services for children with type 1 diabetes and technologies used in diabetes management. Regarding social risk factors, how poverty and low socioeconomic status affect access to these technologies and inequalities in health services are addressed.
- Blue Cluster (Cluster 4) - Socioeconomic Status and Health Disparities: Keywords are type 1 diabetes, socioeconomic status, ethnicity, and health disparities. This cluster includes terms like "type 1 diabetes," "socioeconomic status," "ethnicity," and "health disparities." The theme explores the relationship between diabetes and socioeconomic and ethnic factors. In terms of social risk factors, the effects of poverty, deprivation, and disparities on diabetes prevalence and management are discussed, especially in the context of inequalities in access to health services.
- Orange and Brown Clusters (Clusters 5 and 6) - Technology and Treatment Methods in Diabetes Treatment: The keywords are insulin pump, continuous glucose monitoring, and insulin. These clusters include technological tools used in diabetes treatment, such as "insulin pumps," "continuous glucose monitoring," and "insulin." The theme focuses on using these technologies and their role in diabetes treatment. From a social risk factor perspective, inequalities in access to these technologies and economic barriers are significant issues, particularly for individuals with low socioeconomic status accessing these treatment methods.

These analyses shed light on the relationship between type 1 diabetes and social risk factors in greater detail, emphasizing the importance of more in-depth research.

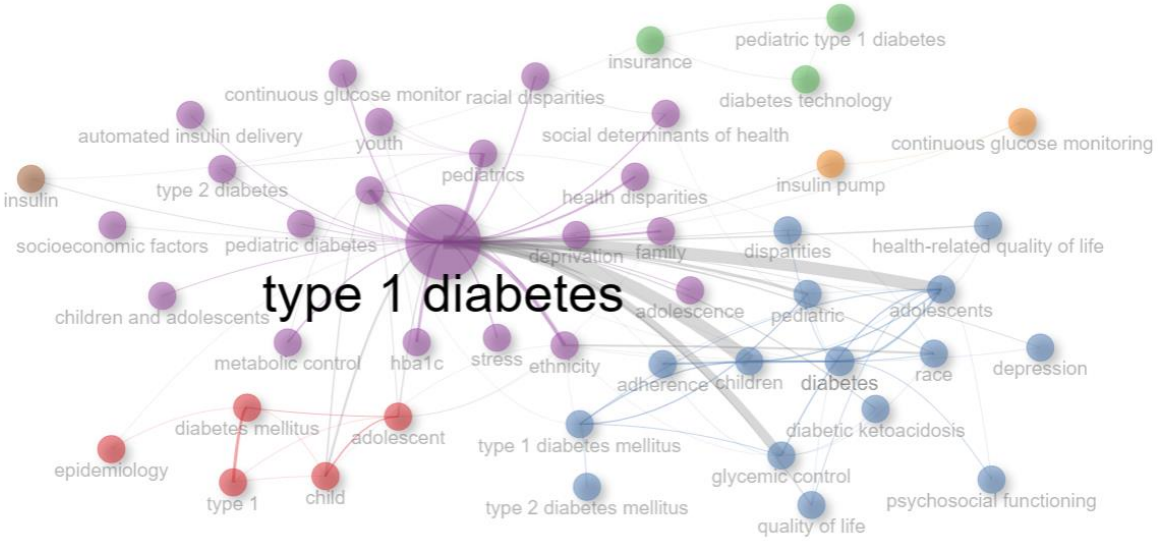


Figure 8. Co-Occurrence Network Analysis (Author Keywords)

DISCUSSION

Type 1 diabetes is a common chronic illness in pediatrics, and a multitude of social risk factors influence its management. Social determinants like poverty and low socioeconomic conditions particularly complicate pediatric diabetes management and the course of the disease. Intertwined with inequalities in access to health services, these effects further complicate diabetes management (4). This study posed the question whether these facts are reflected considerably throughout the scientific publications. The assumption that the impacts of socioeconomic factors and exposure to social risks on type 1 diabetes management, identifying the significant role social risks play in treatment access and continuity, alongside other factors influencing the disease process was behind this question. The discussion section is subdivided into a general introduction, assessments specifically related to two bibliometric analyses (co-citation and co-occurrence), and a general evaluation, concluding with limitations related to the analysis.

The literature supports in general the above mentioned view strongly: The lifelong course and potential complications of type 1 diabetes are more closely associated with environmental factors than the individual's biological characteristics. The progression and complications of type 1 diabetes are closely linked to societal factors such as socioeconomic status. Individuals with lower income face a higher risk of diabetes and its complications, a risk that is more pronounced in impoverished neighborhoods. As income decreases, the prevalence of diabetes increases, indicating a widening of health inequalities related to income over time. This situation highlights the significance of the impact of societal risk factors on Type 1 diabetes (23,28).

Despite the generally accepted impact of socioeconomic factors on diabetes outcomes, the systematic collection of this information in health institutions is rare. While the significant role of economic and social statuses on health is known, routine data collection processes in primary care, as observed in the UK, neglect socioeconomic variables, focusing more on behavioral factors like diet and lifestyle. This underscores the need for comprehensive data collection to better understand social determinants in health (39). Ideally, according to the definitions of ISPAD (International Society for Pediatric and Adolescent Diabetes), a social service specialist should be a part of the pediatric diabetes team (40). However, this is only possible in a very limited number of pediatric diabetes centers in our country.

Technological advancements in type 1 diabetes treatment have improved children's quality of life and glycemic control (41). However, a study shows that children from low-income and ethnic minority groups are not sufficiently benefiting from these technological advancements, thus facing a higher risk of complications and adverse outcomes. Researchers examining Type 1 Diabetes registries in the USA and Germany between 2010-2012 and 2016-2018 found significant socioeconomic differences in these populations. The article also highlights that most clinics in the USA do not incorporate social determinants into routine diabetes care, indicating that interventions made without addressing the challenges faced by low-income families do not improve diabetes control (42).

There is evidence that HbA1c levels are considered the most valid indicator of good diabetes control and are directly related to complication frequency, which is influenced by regional and individual socioeconomic conditions(43). An Italian multicentric study examined the relationship between HbA1c levels and the socioeconomic and clinical characteristics of families of children and adolescents with type 1 diabetes. In this study, the family's socioeconomic status was measured using the Hollingshead Four Factor Social Status Index or parents' years of education. Logistic regression analysis results showed that high socioeconomic status and years of maternal education were significantly associated with achieving target HbA1c values (44). These findings highlight the influence of socioeconomic conditions and family characteristics on the metabolic control of children with type 1 diabetes and emphasize the need to consider this in developing diabetes management strategies.

A long-term study in Denmark observed significant differences in HbA1c levels among children grouped according to their mothers' education levels; particularly, children of mothers with at least a high school diploma had higher HbA1c levels compared to those whose mothers had at least a master's degree (45). These differences can be partly explained by observable characteristics, such as children of more educated mothers performing blood sugar tests more frequently.

These studies demonstrate that family background has a significant impact on the health outcomes of children with type 1 diabetes, and this impact persists even with universal access to health services. The negative effects of diabetes on social and economic outcomes, such as children's school performance and their employment and income status in adulthood, are also noted (46). These findings point to the significant role of socioeconomic factors in diabetes management and the need for these factors to be considered by healthcare providers and policymakers.

There are inadequacies in defining what is meant by socioeconomic conditions. Social risks, which need to be examined multi-dimensionally and multi-layered, are generally measured with a very limited number of variables in medical field journals. While some studies focus on deprivation scales (47), others focus on poverty parameters (48), and some focus solely on income insufficiency (49). In many studies conducted with the same motivation, various combinations of criteria that could be considered disadvantages have been used (17,28).

The management of type 1 diabetes is a complex process with rapid treatment and technological developments, as emphasized in a consensus report by the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD) (50). This requires individuals to manage complex medication regimens and behavioral changes to prevent hypoglycemia. Additionally, as noted by the American Academy of Family Physicians (AAFP), hypoglycemia can lead to serious health issues, and managing severe acute complications like DKA involves having sufficient supplies and prescriptions and education about diabetes management during illness (51). These reports and studies reveal the critical nature of Type 1 diabetes management and the serious health risks that can arise quickly due to inadequate management.

Type 1 diabetes is one of the chronic illnesses most affected by socioeconomic conditions, especially in childhood (42). The reasons for this are generally as follows: 1) Unlike other chronic diseases such as cancer and cardiovascular diseases, which have similar importance in affecting public health, inadequate management of type 1 diabetes can lead to severe health problems not in months or years, but in minutes, hours, and days. 2) Compared to similar diseases, the advancement in treatment technologies is much faster, leading to the rapid deepening of inequalities. 3) Unlike in adult patients, in children, the concept of deprivation includes potential negative characteristics of the parent or caregiver and social environments like schools.

A cause-and-effect model was developed to examine the effects of social risk conditions on pediatric type 1 diabetes by utilizing the results of both co-citation analysis and co-occurrence analysis (Figure 9). The purpose of developing this model is to examine the effects of social risk factors—such as poverty, socioeconomic inequality, education level, ethnic origin, and cultural factors—on diabetes management and outcomes in pediatric type 1 diabetes. The independent variables, which are the social risk factors, include socioeconomic status (income level). This factor is incorporated into the model because low-income families often face challenges in accessing the necessary healthcare services required for effective diabetes management in children. Education level is another independent variable, representing the impact of parents' educational attainment on diabetes management and adherence to treatment protocols. Cultural factors and ethnic origin are included to account for cultural barriers in diabetes management, dietary habits, and perspectives on healthcare services. Additionally, family structure is considered, as single-parent families and those with multiple children may encounter specific difficulties in managing diabetes.

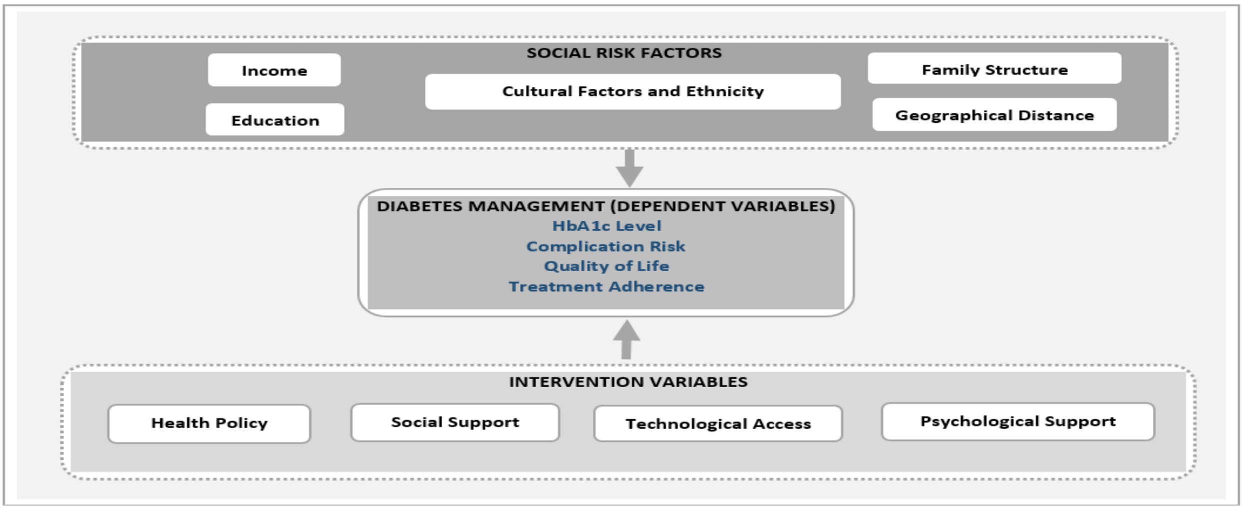


Figure 9. Social and Intervention Factors Influencing Diabetes Control and Treatment Adherence
DV: Dependent variables (Potential dependent variables in blue)
Notes: The references used in developing the model are publications numbered 16, 17, 26, 27, 28, 29, 30, 31, 34, 35, 36, 38, and 41.

Among the independent variables, intervention variables such as health policies and social support are included due to the influence of health insurance and government-provided health support programs. Technological access is added to the model to reflect the availability of technological devices necessary for diabetes management, such as insulin pumps and glucose monitors. Lastly, psychological support is incorporated to highlight the inadequacy of psychosocial support services provided to families and children, which can negatively impact outcomes in type 1 diabetes.

The dependent variables, which pertain to diabetes management and outcomes, include HbA1c levels, which measure long-term blood glucose control; the risk of complications, assessing the likelihood of developing diabetes-related complications; quality of life, evaluating the overall well-being of the child; and treatment adherence, reflecting the level of compliance with diabetes treatment protocols based on social risk conditions.

This model aims to provide a comprehensive understanding of how various social risk factors influence the management and outcomes of type 1 diabetes in children, thereby informing targeted interventions and policy-making to improve health outcomes.

Evaluation of Co-Citation Analyses: This study focuses on socioeconomic factors and deprivation impacting the management and outcomes of type 1 diabetes. Findings highlight significant variability in access to technological treatment methods and healthcare services based on socioeconomic status. As indicated by Addala et al. (19), economically advantaged groups have easier access to expensive diabetes technologies, whereas children from economically challenged families face significant disparities in treatment and health outcomes.

Studies by Sherr et al. (24) and Karges et al. (25) point out that the high cost of insulin pump therapy poses an access barrier for socio-economically disadvantaged groups. Similarly, the cost of continuous glucose monitoring systems limits accessibility in deprived communities (26).

Research by Agarwal et al. (27) documents the potential impacts of socioeconomic factors and deprivation on hospitalization and mortality rates among diabetic individuals during the COVID-19 pandemic, highlighting the struggles in accessing healthcare services for low-income individuals in high-risk areas.

The effects of the quality of education and social support systems on changes in HbA1c among young participants further clarify the impact of social determinants on diabetes (17). Studies by Hill-Briggs et al. (28) and Delamater et al. (29) on psychological care and ISPAD guidelines demonstrate the potential exacerbating effects of socioeconomic inequalities on diabetes management and health outcomes.

In light of these discussions, the following research questions can be proposed for future studies:

- How can disparities in diabetes management and health outcomes among children from economically disadvantaged families be reduced?
- What policies and programs could effectively address inequalities in treatment access arising from socioeconomic status?
- Is it feasible to reduce the cost of or subsidize diabetes technologies for children in low socioeconomic groups, and how would this impact health outcomes?
- How can the role of education and social support systems in diabetes management and health outcomes be strengthened?

Evaluation of Co-Occurrence Analyses: Co-occurrence analysis reveals the critical role of social determinants in managing and prevalence of type 1 diabetes. This analysis documents how poverty and low socioeconomic conditions significantly complicate adolescent diabetes management and early diagnosis. Key findings suggest that poverty and socioeconomic deprivation intersect with inequalities in access to healthcare services, adversely affecting diabetes management.

In this context, barriers to access to diabetes technologies exacerbate challenges faced by children from low-income families. Treatment methods like insulin pumps and continuous glucose monitoring, accessible mainly to those with sufficient economic resources, deepen health inequalities. It is also observed that access to these technologies is not even among socio-economically better-off groups. A comprehensive examination of ethnic and socioeconomic factors in diabetes management and access to healthcare services is clearly needed.

Additionally, understanding the impact of social risk factors on diabetes requires consideration of individual behavioral factors and societal structures. For instance, the sustainability of critical lifestyle factors for diabetes management, like healthy eating and regular exercise among individuals living in low socioeconomic conditions, could be a separate research topic.

In light of these findings, potential research questions for future studies could include:

- How can the role of socioeconomic factors in diabetes management and early diagnosis be optimized?
- What policies and practices can be developed to reduce the impact of inequalities in access to healthcare services on diabetes management?
- How can social equity in access to diabetes technologies be achieved, and what is the impact of these inequalities on health outcomes?
- How can the interaction of ethnic and socioeconomic factors on the prevalence and management of diabetes be examined more in-depth?

Limitations: This study has certain limitations. As with any bibliometric research, these analyses have advantages and disadvantages. For example, while citation analysis helps determine the scope of the study, it does not directly provide quality information. Secondly, this study relies solely on the Web of Science (WoS) database, omitting other databases. Thirdly, our keyword search was limited, and WoS did not provide access to articles before 1975.

Additionally, focusing only on English-language articles might not fully reflect global research outputs (52,53). Lastly, co-citation and co-occurrence analyses have their inherent limitations. Nevertheless, these limitations could serve as an incentive for future research. This article is not a meta-analysis or systematic review that specifically examines the impact of socioeconomic conditions on the prognosis of type 1 diabetes according to a systematic review and meta-analysis technique.

Also, no research questions have been prepared for either meta-analysis or systematic review.

CONCLUSION

The impact of socioeconomic factors and deprivation on the management and health outcomes of type 1 diabetes yields significant implications for public health and health policy. The prioritization of these factors within health policies is essential. Efforts to ensure equal access to healthcare services and address inequalities in treatment methods are vital for reducing health disparities. A deeper understanding of the effects of socioeconomic risk factors on type 1 diabetes will enable the development of more effective intervention methods for individuals and communities. The contributions of these interventions to efforts in achieving equity in diabetes management should represent a significant focal point for future research.

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CASE REPORT

Knee Pain in the Growth Period in Primary Care: Osgood-Schlatter Disease

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ABSTRACT

Osgood-Schlatter Disease (OSD) is one of the common causes of knee pain in children and adolescents during the growth period and is more prevalent among those involved in sports. OSD typically develops due to repeated knee extension and the rapid growth process, leading to microtrauma and apophyseal avulsions at the secondary ossification center of the tibial tubercle. This case report examines a 12-year-old girl engaged in gymnastics who presented with complaints of left knee pain. Although physical examination revealed no pathological findings in either knee, radiographic evaluations showed irregularities and micro avulsion findings in the tibial tubercle. Initial treatment included activity restriction, NSAID usage, and supportive bandaging. After a two-month follow-up, a significant reduction in pain was observed, though pain recurred during periods of intense exercise. Treatment for OSD is generally conservative, focusing on pain control and exercises that enhance muscle flexibility. While the disease often resolves spontaneously, symptoms may persist into adulthood in some cases. This case highlights the importance of early diagnosis and conservative treatment approaches for OSD in primary healthcare settings. Family physicians should consider OSD in the differential diagnosis of knee pain in children and adolescents, and refer patients for multidisciplinary evaluation when necessary.

Keywords: Primary Health Care, Osgood- Schlatter Disease, General Practice.

Birinci Basamakta Büyüme Döneminde Diz Ağrısı: Osgood-Schlatter Hastalığı

ÖZET

Osgood-Schlatter Hastalığı (OSH), büyüme döneminde çocuklarda ve ergenlerde diz ağrısının yaygın nedenlerinden biri olup, özellikle sporla uğraşan bireylerde daha sık görülmektedir. Osgood-Schlatter tipik olarak tekrarlayan diz ekstansiyonu ve hızlı büyüme sürecine bağlı olarak gelişmekte ve tibial tüberkülün sekonder ossifikasyon merkezinde mikrotravma ve apofizyal avülsiyonlara yol açmaktadır. Bu olgu sunumu, jimnastikle ilgilenen ve sol diz ağrısı şikayeti ile başvuran 12 yaşındaki bir kız çocuğunu ele almaktadır. Fizik muayenede her iki dizde de patolojik bulgu saptanmamış olsa da radyografik değerlendirmede tibial tüberkülde düzensizlikler ve mikroavülsiyon bulguları tespit edilmiştir. Başlangıç tedavisi olarak aktivite kısıtlaması, non-steroid antiinflamatuvar ilaç (NSAİİ) kullanımı ve destekleyici bandaj uygulaması önerilmiştir. İki aylık takip sürecinde ağrıda belirgin azalma gözlenmiş, ancak yoğun egzersiz dönemlerinde ağrının tekrar ettiği bildirilmiştir. Osgood-Schlatter tedavisi genellikle konservatif olup, ağrı kontrolü ve kas esnekliğini artırmaya yönelik egzersizleri içermektedir. Hastalık çoğu zaman kendiliğinden düzelmekle birlikte, bazı olgularda semptomlar yetişkinliğe kadar sürebilmektedir. Bu olgu, birinci basamak sağlık hizmetlerinde OSH'nin erken tanısının ve konservatif tedavi yaklaşımlarının önemini vurgulamaktadır. Aile hekimleri, çocuk ve ergenlerde görülen diz ağrısının ayırıcı tanısında OSH'yi göz önünde bulundurmalı ve gerektiğinde hastaları multidisipliner değerlendirme için yönlendirmelidir.

Anahtar Kelimeler: Primary Health Care, Osgood- Schlatter Disease, General Practice

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INTRODUCTION

Osgood-Schlatter Disease (OSD), also known as patellar tendon apophysitis or tibial tubercle traction apophysitis, is recognized as a common benign cause of knee pain in children and adolescents during the growth period (1). The condition was first described independently by Robert B. Osgood and Carl Schlatter in 1903 (2). OSD predominantly occurs in children and adolescents who have not yet achieved skeletal maturity, developing due to repeated stress on the extensor mechanism (3). It commonly affects males aged 10-15 years and females aged 8-13 years and is more frequently seen in those participating in sports involving intensive knee movements, such as running and jumping, particularly in basketball, volleyball, gymnastics, and football (1).

The prevalence of OSD in the 12-15 age group is reported as 9.8%, with a rate of 11.4% in males and 8.3% in females (4). Symptoms are observed in both knees in 20-30% of cases (5). Some studies in the literature report a prevalence of 21% in adolescents participating in sports at the same age and 4.5% among non-athletes (2). Pathophysiologically, OSD is related to tensile stress on the tibial tubercle during the period when it serves as a secondary ossification center and attachment site for the patellar tendon. The strain arises when bone growth outpaces the capacity of the muscle-tendon unit to maintain flexibility (6). Repeated contractions of the quadriceps muscle and intensive knee extensions lead to microtrauma and partial avulsions at the apophyseal ossification center, resulting in swelling, tenderness, and pain (6).

Diagnosis of Osgood-Schlatter Disease is typically clinical, but radiographic examination is recommended in severe or atypical cases to rule out other pathologies such as fractures, infections, or tumors (7). The treatment approach varies according to symptoms. Although the disease is self-limiting, the recovery process can be prolonged and painful. Treatment options include ice application, nonsteroidal anti-inflammatory drugs (NSAIDs), and activity restriction based on the pain level. Stretching and strengthening exercises, particularly targeting the quadriceps and hamstring muscles to enhance lower extremity flexibility, are also recommended (1). Most cases resolve spontaneously with the fusion of the apophysis, but symptoms may persist into adulthood in approximately 10% of cases (7).

CASE PRESENTATION

A 12-year-old girl presented to the family medicine clinic with complaints of increasing pain, especially in her left knee. The patient had no history of trauma, but her family, concerned about the worsening pain, had previously taken her to the pediatric emergency department on several occasions, suspecting potential injury from falls or impacts. However, radiographs taken during these visits did not reveal any acute pathology. As the pain persisted, the family decided, in consultation with the patient, to temporarily discontinue her gymnastics training.

Physical examination revealed normal joint range of motion, with no swelling, redness, or warmth observed in either knee. The patient's vital signs were a normal, and she had no signs of fever or infection. Laboratory results indicated a WBC of 8,500 × 10^6/L and CRP of 0.2 mg/L, both within normal limits. Radiographic examination showed irregularities and micro avulsions in the tibial tuberosity of both knees, more pronounced on the left side (Figures 1 and 2). Based on the history and physical examination findings, the patient was diagnosed with Osgood-Schlatter Disease (OSD), with radiographic findings supporting the diagnosis.

Figure 1. Lateral View of the Left Knee

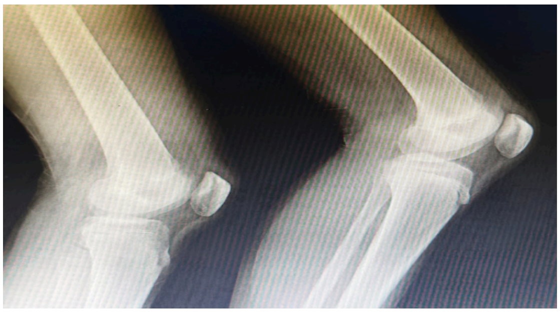

Figure 2. Lateral View of the Left and Right Knee

Treatment during the acute phase included activity restriction, application of a supportive knee bandage, and the administration of nonsteroidal anti-inflammatory drugs (NSAIDs) for pain control. At the two-month follow-up, a significant reduction in pain was reported, although pain recurred following intense exercise. The patient was advised to avoid high-impact exercises and limit intensive physical activities during the growth period, and the family received comprehensive guidance on managing the condition.

DISCUSSION

Osgood-Schlatter Disease is a common cause of knee pain in physically active children and adolescents, particularly those involved in sports, with risk factors including rapid growth, intensive physical activity, and poor muscle flexibility (8). In this case, the absence of trauma, the patient's growth phase, and her participation in a sport that involves substantial physical effort, such as gymnastics, strengthened the diagnosis.

Although Osgood-Schlatter Disease is more common in boys and usually presents at older ages in males, the early presentation in this female patient could be attributed to the earlier maturation of the tibial apophysis in girls (5).

While the diagnosis of Osgood-Schlatter Disease is mainly clinical, malignancy, infection, and other inflammatory pathologies must be ruled out in the differential diagnosis (7). For instance, conditions such as septic arthritis, osteochondritis dissecans, patellar tendinitis, and meniscus injuries are potential causes of knee pain and should be evaluated (9). In this case, the absence of systemic symptoms and laboratory results suggestive of infection supported the diagnosis of Osgood-Schlatter Disease. Additionally, the irregularity and micro avulsion seen in the radiographs of the tibial tuberosity reinforced the diagnosis.

Studies indicate that the prevalence of Osgood-Schlatter Disease is higher among athletes than in the general population (1). The patient’s involvement in gymnastics, a sport that involves repeated knee extensions, likely contributed to the condition. Knee pain exacerbated by exercise is a primary symptom of the disease, aligning with the patient’s complaints (10). However, it is worth noting that some cases are entirely asymptomatic and are diagnosed incidentally.

Conservative treatment is the mainstay in managing Osgood-Schlatter Disease. Activity restriction, NSAID use, and exercises to enhance muscle flexibility, particularly stretching and strengthening exercises for the quadriceps and hamstring muscles, are typically sufficient (11). In this case, activity restriction and NSAID treatment were initiated, and at the two-month follow-up, symptoms had significantly decreased, although pain recurred following intense exercise. This finding suggests that the healing process may extend over several years, and repetitive physical activities can trigger symptoms.

Osgood-Schlatter Disease usually follows a self-limited and benign course. However, surgical intervention may rarely be required in treatment-resistant cases (12). Although surgical treatment has been reported to yield positive results in the literature, conservative treatment led to significant improvement in this case. Through regular follow-ups and appropriate treatment approaches, symptom control was achieved, and the patient was advised to avoid intense physical activities during the growth period.

CONCLUSION

Osgood-Schlatter Disease holds a significant place in primary healthcare as a common cause of knee pain in children and adolescents (10). Recurrent knee pain, particularly in young individuals involved in sports, is a frequent reason for pediatric and adolescent patients to visit family physicians (13). This case highlights the importance of early diagnosis and case management in primary healthcare settings; accurate diagnosis and appropriate referrals reduce the need for unnecessary imaging or advanced tests and allow patients to promptly begin treatment.

Family physicians are well-positioned to quickly differentiate between other pathologies that may cause pain in children and adolescents and to provide conservative treatment options. This role underscores the importance of primary care and family medicine in monitoring the disease's natural course and referring patients for multidisciplinary evaluation when necessary.

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Letter to Editor

Spiritual Intelligence: An Unexplored Aspect of Clinical Practice

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ABSTRACT

In the fast-paced world of medicine, where diagnostic tools and pharmaceutical interventions often take centre stage, the subtle but powerful dimension of spiritual Quotient (SQ) is gaining increasing recognition as a vital component of effective clinical practice. More than just religiosity or belief systems, SQ refers to the capacity to understand, experience, and integrate spiritual values into one's daily life, fostering a sense of meaning, purpose, and connection. While not a replacement for traditional medical knowledge, SQ can significantly enhance a clinician's ability to provide truly holistic and compassionate care. Patients are more than just a collection of symptoms and lab results. They are individuals wrestling with profound existential questions, facing fear, uncertainty, and often, a search for meaning in the face of illness. A clinician with high SQ is attuned to these underlying spiritual and emotional needs. SQ cultivates the ability to truly listen to patients, not just to gather information, but to understand their fears, hopes, and spiritual beliefs.

Keywords: Spiritual Intelligence, Spirituality, Clinical Practice, Medical Ethics.

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Ruhsal Zeka: Klinik Uygulamanın Keşfedilmemiş Bir Yönü

ÖZET

Tanı araçlarının ve farmasötik müdahalelerin sıklıkla merkez sahne aldığı hızlı tempolu tıp dünyasında, ruhsal Katsayı'nın (SQ) incelikli ama güçlü boyutu, etkili klinik uygulamanın hayati bir bileşeni olarak giderek daha fazla kabul görmektedir. SQ, sadece dindarlık veya inanç sistemlerinden daha fazlasıdır; ruhsal değerleri günlük yaşamına anlama, deneyimleme ve entegre etme kapasitesini ifade eder ve bir anlam, amaç ve bağlantı duygusunu teşvik eder. Geleneksel tıbbi bilginin yerini almasa da SQ, bir klinisyenin gerçekten bütünsel ve şefkatli bakım sağlama yeteneğini önemli ölçüde artırabilir. Hastalar, sadece bir semptom ve laboratuvar sonuçları koleksiyonundan daha fazlasıdır. Derin varoluşsal sorularla boğuşan, korku, belirsizlik ve sıklıkla hastalık karşısında anlam arayışıyla karşı karşıya kalan bireylerdir. Yüksek SQ'ya sahip bir klinisyen, bu temel ruhsal ve duygusal ihtiyaçlara uyum sağlar. SQ, sadece bilgi toplamak için değil, aynı zamanda korkularını, umutlarını ve ruhsal inançlarını anlamak için hastaları gerçekten dinleme yeteneğini geliştirir.

Anahtar Kelimeler: Ruhsal Zeka, Spiritüellik, Klinik Uygulama, Tıp Etiği

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Dear Editor,

In the fast-paced world of medicine, where diagnostic tools and pharmaceutical interventions often take centre stage, the subtle but powerful dimension of spiritual Quotient (SQ) is gaining increasing recognition as a vital component of effective clinical practice. More than just religiosity or belief systems, SQ refers to the capacity to understand, experience, and integrate spiritual values into one's daily life, fostering a sense of meaning, purpose, and connection (1). While not a replacement for traditional medical knowledge, SQ can significantly enhance a clinician's ability to provide truly holistic and compassionate care. Patients are more than just a collection of symptoms and lab results. They are individuals wrestling with profound existential questions, facing fear, uncertainty, and often, a search for meaning in the face of illness. A clinician with high SQ is attuned to these underlying spiritual and emotional needs. SQ cultivates the ability to truly listen to patients, not just to gather information, but to understand their fears, hopes, and spiritual beliefs (2). This presence allows for a deeper connection and helps patients feel heard and validated. SQ provides a framework for understanding that illness can trigger profound spiritual distress, existential questioning, and a sense of loss (2,3). Recognizing these needs allows clinicians to address them with sensitivity and compassion (Figure 1).

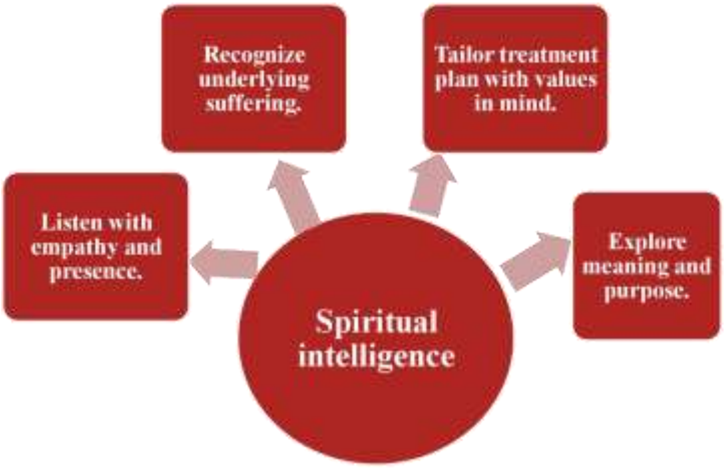

Figure 1. A schematic picture shows that how the spiritual intelligence enables clinician to understand the underlying suffering of patients.

SQ enables clinicians to consider a patient's values and beliefs when developing treatment plans. This can involve respecting religious practices, incorporating spiritual practices into coping strategies, or offering resources for spiritual support, for patients facing chronic illness or end-of-life care, SQ allows clinicians to facilitate conversations about meaning, purpose, and legacy. Helping patients connect with their values and find meaning in their experiences can significantly improve their quality of life (2).

The demanding nature of clinical practice can take a toll on even the most dedicated healthcare professionals. High SQ can serve as a buffer against burnout and compassion fatigue. SQ encourages self-reflection, helping clinicians understand their own values, beliefs, and motivations (1,2). This self-awareness allows them to approach challenging situations with greater emotional intelligence and resilience. By connecting their work to a larger sense of purpose, clinicians with high SQ are better able to cope with the stresses of the job and find fulfilment in their contributions. SQ often involves practices like meditation, mindfulness, and gratitude, which can help clinicians manage stress, cultivate inner peace, and improve their overall wellbeing. SQ fosters empathy, compassion, and effective communication, leading to stronger relationships with colleagues, patients, and their families' .Spiritual intelligence is not a substitute for medical expertise, but rather a complementary dimension that enhances clinical practice (4).

By cultivating SQ, clinicians can move beyond treating symptoms and connect with patients on a deeper level, fostering healing, promoting wellbeing, and finding greater meaning in their own work. As healthcare continues to evolve, embracing the principles of SQ will be crucial in creating a more compassionate, patient-cantered, and truly holistic approach to care.

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