Original Research / Orijinal Araştırma

Primary Care Physicians' Anxiety About Medical Errors and Attitudes Towards Defensive Medicine

Birinci Basamak Hekimlerinin Tıbbi Hata Kaygısı ve Defansif Tıbba Yönelik Tutumları

Burak NENG[1], Fatih Hitami USLUOĞULLARI[2], Alican SARISALTIK[3], Mehmet Akif İNANICI[2], Mehmet AKMAN[4]

Abstract

Objective: This study aimed to evaluate the relationship between family physicians' anxiety about medical errors and their attitudes towards defensive medicine by measuring their malpractice fear and defensive medicine behaviors.

Method: This descriptive study included 395 family physicians working in family health centers in İstanbul/Türkiye. The study's data was collected via an online questionnaire, which included 58 items. The questionnaire included four sections: a sociodemographic form, Malpractice Knowledge Level Form, Malpractice Fear Scale, and Defensive Medicine Behavior Scale. Spearman's correlation coefficient and Mann-Whitney U, chi-square, and Fisher's exact tests were used in data analysis. $p<0.05$ was considered a statistically significant level.

Results: Of the physicians, the mean age was 38.07 years (SD=8.42 years), and 55.6% (n=219) were female. The mean duration of working as a physician was 7.38 years (SD=4.40 years), ranging from 1 to 38 years. The proportion of participants who complained due to malpractice was 12.2%, and 28.4% had received education on medical errors. The proportion of physicians with a high level of malpractice fear was 74.4%. The mean correct response rate on the Malpractice Knowledge Level Form was 69.44 (SD=13.21), with 62.9% having a sufficient knowledge level. Low-level but statistically significant negative correlations were found between increasing age and defensive medicine attitudes and malpractice fears ($p<0.05$ for all). Also, moderate and high levels of positive correlations were found between defensive medicine practice scores and malpractice fear scores ($p<0.05$ for all).

Conclusion: The study showed that increased fear of medical errors causes defensive medicine attitudes among family physicians. As both malpractice fear and defensive medicine practices decrease with increasing age, young physicians should receive education to foster better patient communication without anxiety. Legal reforms and health policies that reduce the pressure physicians feel from medical error anxiety are necessary.

Keywords: Medical error, patient safety, defensive medicine, family medicine, malpractice.

Özet

Giriş: Bu çalışmada, aile hekimlerinin tıbbi hatalara ilişkin kaygıları ile defansif tıp tutumları arasındaki ilişkinin, malpraktis korku düzeyleri ve defansif tıp davranışları ölçülerek değerlendirilmesi amaçlanmıştır.

Yöntem: Bu tanımlayıcı çalışmaya İstanbul/Türkiye'de aile sağlığı merkezlerinde çalışan 395 aile hekimi katılmıştır. Çalışmanın verileri 58 maddeden oluşan çevrimiçi anket aracılığıyla toplanmıştır. Anket dört bölümden oluşmaktadır: Sosyodemografik form, Malpraktis Bilgi Düzeyi Formu, Malpraktis Korku Ölçeği ve Defansif Tıp Uygulamaları Tutum Ölçeği. Verilerin analizinde Spearman'ın korelasyon katsayısı ve Mann-Whitney U, ki-kare ve Fisher'in kesin testleri kullanılmıştır. İstatistiksel anlamlılık düzeyi olarak $p<0,05$ kabul edilmiştir.

Bulgular: Hekimlerin ortalama yaşı 38,07 yıl (SD=8,42 yıl) olup %55,6'sı kadındır. Hekim olarak çalışma süresinin ortalaması 7,38 yıl (SD=4,40 yıl) olup, 1 ile 38 yıl arasında değişmektedir. Katılımcıların içerisinde hakkında malpraktis nedeniyle şikayette bulunulanların oranı %12,2 olup, %28,4'ü tıbbi hatalar konusunda eğitim almıştır. Yüksek düzeyde malpraktis korkusu olan hekimlerin oranı %74,4'tür. Malpraktis Bilgi Düzeyi Formundaki ortalama doğru yanıt oranı 69,44'tür (SD=13,21) ve %62,9'unun yeterli bilgi düzeyine sahip olduğu görülmüştür. Artan yaş ile defansif tıp tutumları ve malpraktis korkuları arasında düşük düzeyde ancak istatistiksel olarak anlamlı negatif korelasyonlar bulunmuştur (tümü için $p<0,05$). Ayrıca, defansif tıp uygulama puanları ile malpraktis korku puanları arasında orta ve yüksek düzeyde pozitif korelasyonlar bulunmuştur (tümü için $p<0,05$).

Sonuç: Çalışma, tıbbi hata korkusunun artmasının aile hekimleri arasında defansif tıp tutumlarına neden olduğunu göstermiştir. Hem malpraktis korkusu hem de defansif tıp uygulamaları yaş arttıkça azaldığından, genç hekimler kaygı olmadan daha iyi hasta iletişimi sağlamaları için eğitim almalıdır. Hekimlerin tıbbi hata kaygısından kaynaklı hissettikleri baskıyı azaltan yasal reformlar ve sağlık politikaları gereklidir.

Anahtar Kelimeler: Tıbbi uygulama hatası, hasta güvenliği, defansif tıp, aile hekimliği, malpraktis

Geliş tarihi / Received: 21.08.2024 Kabul tarihi / Accepted: 19.05.2025

[1] Kurum: T. C. Sağlık Bakanlığı, Sultanbeyli 3 Nolu Aile Sağlığı Merkezi, İstanbul, Türkiye
[2] Marmara Üniversitesi, Tıp Fakültesi, Adli Tıp Anabilim Dalı, İstanbul, Türkiye
[3] Marmara Üniversitesi, Tıp Fakültesi, Halk Sağlığı Anabilim Dalı, İstanbul, Türkiye
[4] Marmara Üniversitesi, Tıp Fakültesi, Aile Hekimliği Anabilim Dalı, İstanbul, Türkiye

Address for Correspondence / Yazışma Adresi: Mehmet AKMAN. Fevzi Çakmak Mh, Muhsin Yazıcıoğlu Cd No:10, 34899 Pendik/İstanbul

E-posta: makman4@gmail.com Tel: +90 542-313-63-89

Neng B. Usluoğulları FH. Sarısaltık A. İnanıcı MA, Akman M. ***Primary Care Physicians' Anxiety About Medical Errors and Attitudes Towards Defensive Medicine.*** *TJFMPC, 2025; 19 (2):226-233*
DOI: 10.21763/tjfmpc.1536832

Introduction

In 1992, the World Medical Association defined medical errors in its 44th General Assembly Declaration as "harm resulting from the physician's failure to perform standard practice, lack of skill, or failure to treat the patient," emphasizing that this should not be confused with complications that may occur during the treatment process.[1] Therefore, a medical error constitutes a preventable negative outcome of healthcare, regardless of its visibility or potential harm to the patient. This could involve a misdiagnosis or insufficient treatment of a condition, injury, behavior, infection, or any other health issue.[2] The Turkish Medical Association continues its efforts to find a counterpart for the concept of malpractice, expressed as "harm resulting from healthcare services" or "medical errors".[3] A crucial distinction lies in the fact that medical errors occur from actions taken with sincere intentions, while medical malpractice involves harm or loss to a patient resulting from a failure of a healthcare professional to deliver proper care, which may arise from negligence, a serious lack of proficiency, or even criminal intent.[2]

Acknowledging the shortcomings, mistakes, and possible risks that lead to adverse events enables the development of strategies designed to prevent medical errors. Modifying the culture within healthcare settings and establishing guidelines for managing medical errors can promote the reporting of such errors. Organizations that embrace a culture focused on patient safety and take corrective actions can enhance the safety of both patients and healthcare professionals. [4]

Defensive medicine is described as physicians ordering tests and consultations unnecessarily due to fear of litigation and avoiding high-risk patients or conditions.[5] Defensive medicine is divided into two categories: positive defensive medicine, where physicians apply tests and procedures they would not usually request due to medical error anxiety, and negative defensive medicine, where physicians avoid treating patients to prevent complications that may arise during treatment due to medical error anxiety.[6] Physicians practicing defensive medicine, such as keeping patients hospitalized unnecessarily, making unnecessary referrals, or ordering additional tests out of fear of being sued, can harm both patients and themselves legally.[7]

Worldwide studies on the prevalence of defensive medicine showed that Summerton et al.'s study in 2000 in the UK found a prevalence of 90%, Catino and Cellotti's study in Italy in 2009 found 77.9%, Moosazadeh et al.'s study in Iran in 2014 found 99.8%, and Zhu et al.'s study in China in 2018 found 62.9%. In Turkey, studies by Aynacı et al. in 2008 found 78.4%, Başer et al. found 78.8%, and Özata et al. found 61.8% prevalence of defensive medicine.[8] Recent research indicated that the cost of defensive medicine practices in the USA ranges between 8% and 20% of total healthcare costs.[9]

Medical error anxiety is defined as the fear arising from the possibility of being sued for medical malpractice while practicing their profession. The increasing number of medical malpractice lawsuits in recent years has seriously affected physicians and society. Failed treatments often result in medical malpractice claims, and the media's significant interest in these cases further heightens physicians' medical error anxiety.[10] The relationship between malpractice litigation and patient safety is multifaceted, influencing both provider behavior and systemic practices. On one hand, the threat of litigation can act as a deterrent, encouraging healthcare providers to adhere to safety protocols and reduce negligence.[11] However, literature indicated that medical error anxiety leads to deterioration in patient health, increased healthcare costs, psychological distress for physicians, and a decline in the quality of healthcare services.[12] These findings suggest that while litigation has a role in accountability, a balanced approach integrating patient safety initiatives and legal reform is essential to improve healthcare outcomes.[11]

The fear of malpractice has been identified to increase healthcare costs and make healthcare access more difficult. Additionally, malpractice fear hinders the development of healthcare quality, makes physicians anxious about applying newly developed treatment methods, and obstructs the development of new treatment methods.[12]

This study aimed to measure family physicians' levels of malpractice fear and their attitudes toward defensive medicine, evaluating the relationship between medical error anxiety and attitudes toward defensive medicine.

Methods

The population of this descriptive study consisted of all family physicians working in family health centers in Istanbul. The required minimum sample size for the study was determined to be 384, based on a margin of error of 0.05 and a power of 80.0%, while assuming a sufficient level of knowledge regarding malpractice at 50.0%. Due to the use of convenience sampling, randomization was not applied. Inclusion criteria were being an actively working family physician in a Family Health Center in Istanbul. Physicians on unpaid leave, maternity leave, or those who did not consent to participate were excluded. Participants were provided with an online informed consent form explaining the study. Once they agreed, they completed the survey using Google Forms, which was shared through WhatsApp and Facebook. Ethics committee approval was received from the Ethics Committee of Marmara University School of Medicine dated 02.12.2022 with the protocol code 09.2022.1577.

The questionnaire used in this study consisted of four sections. In the first section of the questionnaire, to evaluate sociodemographic characteristics, physicians were asked nine questions regarding their age, title, gender, marital status, duration in the profession, duration of working in family medicine, and malpractice experiences.
In the following section, the Malpractice Knowledge Level Form (MKLF) was utilized. The knowledge level of the participants regarding malpractice was assessed using a questionnaire developed by Gedik et al., which contained 25 statements, 17 of which were correct and 8 incorrect, and had a Cronbach's Alpha score of 0.926. Each correct response counts as 1 point, and scores above 16 were considered sufficient knowledge levels, while scores of 16 or below were considered insufficient.[13]
In the third part of the questionnaire, the Malpractice Fear Scale (MFS) by Katz et al., which measures physicians' levels of malpractice fear with six items, was used.[14] The scale, Turkish version of the scale, was developed by Uğrak et al. in 2020, showed a Cronbach's Alpha of 0.860 and a Composite Reliability coefficient of 0.858, indicating high reliability.[12] Items are scored on a 5-point Likert-type scale from (1) Strongly Disagree to (5) Strongly Agree. The total score varies between 6 and 30, and higher scores indicate higher levels of fear of malpractice. Malpractice fear levels of 15 and below are evaluated as low level, 15-20 as medium level, and 20 and above as high-level fear.
The fourth section consisted of the Defensive Medicine Behavior Scale (DMBS) developed by Başer et al. in 2014.[15] The scale's reliability analysis showed a Cronbach's Alpha of 0.853, with high internal consistency. The positive defensive medicine subscale had a Cronbach's Alpha of 0.685, and the negative defensive medicine subscale had a Cronbach's Alpha of 0.918.[15]
Data obtained from the study were analyzed using IBM SPSS version 29. Continuous variables were analyzed using non-parametric tests (Mann-Whitney U and Kruskal-Wallis tests) due to the data's failure to meet parametric test assumptions. Categorical variables were analyzed by chi-square and Fisher's exact tests. Adjusted p-values were considered in post-hoc pairwise comparisons. Correlation analyses were evaluated with Spearman's rank correlation coefficient. $p<0.05$ was considered a statistically significant level.

Results

The study included 395 family physicians working in Family Health Centers. Of the physicians, 55.6% (n=219) were female, and 70.3% (n=275) were married. Participants' ages ranged from 25 to 63 years, with a mean age of 38.07 years (SD=8.42 years). The average number of years spent working as a physician was 7.38 years (SD=4.40 years), ranging from 1 to 38 years. Among the participants, 19.3% (n=76) had worked for ≤5 years, 33.5% (n=132) for 6-10 years, and 47.2% (n=186) for >10 years. Regarding titles, 44.8% (n=177) were general practitioners, 35.9% (n=142) were residents, and 19.2% (n=76) were specialists (Table 1).

Table 1. *Participants' Individual Characteristics*

Characteristic	n (%)
Gender	
Female	219 (55.6)
Male	175 (44.4)
Total	394 (100.0)
Marital Status	
Single	116 (29.7)
Married	275 (70.3)
Total	391 (100.0)
Duration in Profession	
≤5 years	76 (19.3)
6-10 years	132 (33.5)
>10 years	186 (47.2)
Total	394 (100.0)
Title	
General Practitioner	177 (44.8)
Resident	142 (35.9)
Specialist	76 (19.2)
Total	395 (100.0)
Age (years)*	38.07 ± 8.42
Duration working as Family Medicine Physician (years)*	7.38 ± 4.40

**Mean ± standard deviation*

The mean score for the MFS was 21.98 (SD=7.11). The percentage of doctors experiencing a significant level of fear regarding malpractice stood at 74.4% (n=294). The mean scores for the DMBS were 47.28 (SD=13.71) and 29.43 (SD=8.71) for the positive attitude and 17.85 (SD=5.87) for the negative attitude subscales. The mean percentage of correct answers on the Malpractice Knowledge Level Form was 69.44 (SD=13.21), with 62.9% (n=231) having sufficient knowledge levels (Table 2). The statements with the lowest correct response rates were found as follows; "Informed consent from patients must be obtained in writing in all cases (incorrect statement)" (14.5%), "Euthanasia is not considered malpractice (incorrect statement)" (28.4%), "There is no specific law regarding malpractice in Türkiye" (32.2%), "A physician is not considered guilty if a patient is harmed as a result of a malfunction in medical devices and instruments (incorrect statement)" (43.7%), "If the patient is not informed in advance, complications are considered malpractice" (50.9%) and "Informed consent from the patient prevents the physician from being punished for his/her faulty behavior (incorrect statement)" (57.6%).

Table 2. *MFS, DMBS, and MKLF Scores of Physicians*

Measurement	n (%) / Mean ± SD
MFS Total Score	21.98 ± 7.11
MFS Level	
Low	71 (18.0)
Moderate	30 (7.6)
High	294 (74.4)
DMBS Total Score	47.28 ± 13.71
DMBS Positive Attitude Score	29.43 ± 8.71
DMBS Negative Attitude Score	17.85 ± 5.87
MKLF Correct Response Rate (%)	69.44 ± 13.21
Malpractice Knowledge Level	
Insufficient (≤16)	136 (37.1)
Sufficient (>16)	231 (62.9)

SD: Standard deviation, MFS: Malpractice Fear Scale, DMBS: Defensive Medicine Behavior Scale, MKLF: Malpractice Knowledge Level Form

Table 3 shows the correlations between individual characteristics of physicians and their attitudes towards defensive medicine and malpractice fears. Minor yet statistically significant negative correlations were observed between advancing age and attitudes toward defensive medicine as well as fears related to malpractice ($p<0.05$ for all). An increase in years worked in the Family Health Center was associated with a decrease in the total DMBS score and positive attitude subscale score ($p=0.019$ and $p=0.009$, respectively). Moderate or high levels of statistically significant correlations were found between DMBS total and subscales scores and MFS scores ($p<0.05$ for all). In other words, an increase in MFS scores was positively correlated with an increase in DMBS scores.

Table 3. *Correlations Between Individual Characteristics, Defensive Medicine Behaviors, and Malpractice Fear*

Variable	DMBS Total	DMBS Positive Attitude	DMBS Negative Attitude	MFS Total
Age	-0.179**	-0.208**	-0.130*	-0.128*
Years in FH Center	-0.119*	-0.132**	-0.094	-0.061
DMBS Total	-	0.952**	0.883**	0.655**
DMBS Positive Attitude	-	-	0.710**	0.597**
DMBS Negative Attitude	-	-	-	0.632**

Spearman's correlation coefficients are shown.
**p<0.05, ** p<0.01*
DMBS: Defensive Medicine Behavior Scale, MFS: Malpractice Fear Scale, FH Center: Family Health Center

The MFS score and the DMBS total, positive and negative scores were significantly higher in physicians aged 40 and under than in those who are over 40 years old. An analysis of the relationship between gender and scale scores indicated that female and male physicians showed no statistically significant differences (Table 4).

Table 4. *Relationships between gender and age and scale scores*

	Gender		p*	Age (years)		p*
	Female	Male		≤40	>40	
MFS Total Score	21.96 ± 6.98	22.04 ± 7.30	0.632	22.63 ± 6.93	20.59 ± 7.31	0.005
DMBS Total Score	47.00 ± 13.62	47.74 ± 13.83	0.566	48.82 ± 12.94	44.00 ± 14.75	0.003
DMBS Positive Attitude Score	29.43 ± 8.55	29.52 ± 8.89	0.911	30.50 ± 8.29	27.15 ± 9.18	<0.001
DMBS Negative Attitude Score	17.57 ± 5.93	18.22 ± 5.81	0.242	18.32 ± 5.60	16.85 ± 6.33	0.032
MKLF Correct Response Rate (%)	69.10 ± 12.54	69.84 ± 14.08	0.133	70.23 ± 12.76	67.60 ± 14.10	0.109

**Mann–Whitney U test was applied in all analyses.*
Mean ± standard deviation values are shown.
MFS: Malpractice Fear Scale, DMBS: Defensive Medicine Behavior Scale, MKLF: Malpractice Knowledge Level Form

Upon assessing the connections between personal characteristics and DMBS scores, a significant difference emerged concerning attitudes towards defensive medicine and the number of years a physician has been practicing (p=0.008). Pairwise comparisons showed that physicians with more than ten years of experience had significantly lower defensive medicine behavior scores (44.92 ± 14.53) compared to those with ≤5 years (48.62 ± 13.66) and 6-10 years (49.76 ± 12.02) of experience (p=0.047 and p=0.004, respectively). Physicians without prior education on medical errors had higher DMBS scores than those who attended an education on medical errors before (48.11 ± 13.83 vs. 45.20 ± 13.23, p=0.044). No significant differences regarding individual characteristics were found in other comparisons.

The proportion of physicians with high levels of malpractice fear was highest in the 6-10 years of experience group (82.6%), followed by the ≤5 years group (73.7%) and the >10 years group (68.8%). A statistically significant difference was found between groups regarding levels of malpractice fear (p=0.012). Pairwise comparisons showed that the 6-10 years group had significantly higher malpractice fear levels than the >10 years group (p=0.019). No significant differences were found in the other pairwise comparisons. No notable differences were found in terms of gender, job title, participation in malpractice lawsuits, being subjected to malpractice complaints, or attending educational sessions on medical errors regarding the fear of malpractice (p>0.05 for all).

Discussion

The mean correct response rate for malpractice knowledge level was found to be 69.44, with 62.9% of participating physicians having sufficient knowledge levels. Gedik et al. (2021) found that 66.8% of 916 fifth-year medical students had sufficient malpractice knowledge levels.[13] Uğrak et al. (2019) discovered that merely 21% of doctors deemed their understanding of malpractice to be adequate, suggesting that, overall, physicians' levels of knowledge were below the average.[16] The research by Sheikh in 2012 revealed that a significant majority of surgeons (68.7%) in Pakistan lacked comprehensive knowledge regarding malpractice.[17] Various approaches have been employed in the literature to assess levels of knowledge regarding malpractice. However, the sufficient knowledge level rate in our study is similar to studies using the same malpractice knowledge level form. The assessment that focused on questions revealed that doctors possess limited understanding regarding how to inform patients, the significance of obtaining written consent, and the circumstances under which it is necessary, and the legal framework surrounding malpractice in Türkiye. There is a need for training that encourages them to stay up to date on these topics and on issues that tend to change over time due to new legal regulations.

The mean score for the Malpractice Fear Scale in our study was 21.98, indicating high levels of fear among physicians. The proportions of high, moderate, and low levels of fear were 74.4%, 7.6%, and 18%, respectively. Can et al. (2023) found that 65.7% of 143 emergency physicians had high levels of fear, while 24.5% had moderate and 9.8% had low malpractice fear.[18] The research conducted by Uğrak et al. in 2019 showed that 59.3% of physicians had high levels of malpractice fear, 28.2% had moderate levels, and 12.5% had low levels of fear.[12] Katz et al. (2005) found that 39.7% of 33 emergency physicians had high levels of malpractice fear, 37.7% had moderate levels, and 43.7% had low levels [14] Studies by Reed et al. (2008), Benbassat et al. (2001), and Reschovsky and Saiontz-Martinez (2017) also found high levels of malpractice fear among physicians.[19-21] Our study is consistent with the literature, showing high levels of malpractice fear among physicians. Regulations aimed at patient safety play a vital role in decreasing malpractice and guaranteeing high-quality care; however, they yield the best results when paired with a culture that promotes safety and ongoing enhancement. They establish accountability mechanisms that can deter negligent behavior and encourage healthcare professionals to keep their skills and knowledge current.[22] A collaborative culture that prioritizes transparent communication, non-punitive error reporting, and team-based problem-solving is essential for transforming regulations into real-world safety gains.[23] In such an environment, healthcare professionals feel empowered to report mistakes, learn from errors, and continually refine their processes, ultimately fostering safer care for patients. A law passed in Italy in 2017 guaranteed that safety is a fundamental right for all individuals seeking health services. The law indicated that healthcare workers are safeguarded from legal liability if they comply with the protocols and safety measures endorsed by the National Institute of Health in Italy, regardless of any negative outcomes. Legal actions against these professionals are permissible only in cases of malicious intent or gross negligence.[24]

Upon evaluating the connection between physicians' fear of malpractice and their perspectives on defensive medicine, we found statistically significant correlations between DMBS and MFS scores. This suggests that higher levels of malpractice anxiety are associated with more favorable attitudes towards defensive medicine. Our research shows that physicians approach patients more defensively as their level of fear increases.

When we looked at the relationship between age and levels of malpractice fear and defensive medicine attitudes, low levels of statistically significant negative correlations were found, indicating that as age increases, defensive attitudes and malpractice fears decrease. This negative correlation may be due to increased experience with age and less awareness of medical malpractice among older physicians. In addition, there was also no significant difference between female and male physicians in terms of malpractice fear, defensive medicine behavior, and malpractice knowledge in our study.

Physicians who received education on medical errors had higher levels of sufficient knowledge about defensive medicine compared to those who did not receive. Additionally, those who received an education had lower DMBS scores. However, no significant relationship was found between receiving education and levels of malpractice fear. Improving education before and after graduation could positively influence defensive mindsets and help physicians feel more informed and competent.Our study found that physicians with more than 10 years of experience had significantly lower defensive medicine behavior scores compared to other groups. Banaz et al. (2022) found that physicians with more than 11 years of experience had less defensive attitudes compared to those with 5-10 years of experience.[25] In Catino's study, it was revealed that younger physicians exhibited more defensive behaviors compared to older physicians.[26] Hiyama et al. (2006) also indicated that physicians with more than 20 years of experience exhibited less defensive attitudes.[27] Our study is consistent with the literature, indicating that increased professional experience leads to less defensive attitudes.

Our study has several limitations. Initially, convenience sampling was employed, resulting in the inability to eliminate volunteer bias. Physicians who were more interested in the research subject may have represented a higher rate in the study. Second, the results of our study cannot be generalized to the population due to the lack of

representativeness of convenience sampling. Third, the emotional state of the participating physicians was not evaluated, which may have influenced the results. They may also tend to show a positive image in their responses about fears related to malpractice and their anxiety concerning medical errors. Fourth, detailed questioning of the content of training on medical errors was not conducted. Fifth, the items "keeping more detailed records to avoid legal issues" and "using imaging tests more frequently to avoid legal issues" in the DMBS could not be performed in family health centers, which may have affected our results.

Conclusions

A study conducted among family physicians, general practitioners, and residents at Family Health Centers in Istanbul revealed that an increase in fear of medical errors adversely impacts physicians' defensive stances. Nevertheless, the fear of malpractice is not the sole definitive element influencing this attitude.

It is recommended that physicians be well-versed in the concepts of defensive medicine and medical errors, and their consequences. As age increases, malpractice fear and defensive medicine practices decrease; therefore, especially young physicians should be educated on this topic to ensure better communication with their patients without medical error anxiety. The impact of media content on physicians should be scrutinized, and further research should be conducted on this topic.

Post-graduation education on physician-patient communication should be provided, and mental health assistance should be provided to physicians regarding medical error anxiety. Legal regulations reducing medical error anxiety and pressure on physicians should be implemented, and healthcare policies should be developed to make physicians feel more secure. More detailed research on medical errors and defensive medicine should be conducted to raise awareness. Future studies on this subject are needed in different regions and different medical specialties.

Ethics Statement

Ethics committee approval was obtained from the Ethics Committee of Marmara University School of Medicine on 02.12.2022 with the protocol code 09.2022.1577.

Conflict of Interest Statement

The authors declare that there is no conflict of interest.

Funding Statement

Ethics committee approval was obtained from the Ethics Committee of Marmara University School of Medicine on 02.12.2022 with the protocol code 09.2022.1577.

Artificial Intelligence Statement

No artificial intelligence tools were used in the preparation of this article.

References

1. S. Koc. Adli tıbbi açıdan malpraktis ve hekim sorumluluğu. Toraks Cerrahisi Bul. c. 5, sayı 1, 2014. p.14-22.
2. Karande S, Marraro GA, Spada C. Minimizing medical errors to improve patient safety: An essential mission ahead. J Postgrad Med. 2021;67(1):1-3. https://doi.org/10.4103/jpgm.JPGM_1376_20
3. Karataş M, Yakıncı C. Tıbbi hata nedenleri ve çözüm yolları. Journal of Turgut Ozal Medical Center. 2010;17(3):233-236.
4. Rodziewicz TL, Houseman B, Vaqar S, et al. Medical Error Reduction and Prevention. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2025. https://www.ncbi.nlm.nih.gov/books/NBK499956/ Accessed January 7, 2025.
5. Ünal Ö. Defansif tıp uygulamaları, öncülleri ve sonuçları. Sakarya Üniversitesi İşletme Enstitüsü, Sağlık Yönetimi Doktora Tezi, Sakarya, 2020. p.1-2.
6. Hershey N. The defensive practice of medicine: Myth or reality. The Milbank Memorial Fund Quarterly. 1972;50(1):69-97. https://doi.org/10.2307/3349487
7. Yilmaz KC, Polat MO, Kocamaz B. Defansif tıp uygulamalarının hukuksal açıdan incelenmesi. Türkiye Adalet Akademisi Dergisi. 2014;5(16):19-51.
8. Özer K, Aslan Ş. Defansif tıp uygulamalarının belirlenmesi: Karma yöntem araştırması. Hacettepe Sağlık İdaresi Dergisi. 2020;23(4):639-664.
9. Mansur F, Ceylan Ö. Defansif tıp ve defansif tıp konusunda yapılan akademik çalışmalar üzerine bir derleme. Ankara Hacı Bayram Veli Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi. 2021;23(3):721-744. https://doi.org/10.26745/ahbvuibfd.994079
10. Hauser MJ, Commons ML, Bursztajn HJ, Gutheil TG. Fear of malpractice liability and its role in clinical decision making. Decision making in psychiatry and the law. Baltimore, MD, US: Williams & Wilkins Co; 1991. p. 209-226.

11. Studdert DM, Mello MM, Brennan TA. Medical malpractice. N Engl J Med. 2004;350(3):283-292. https://doi.org/10.1056/NEJMhpr035470
12. Uğrak U, Işık O. Malpraktis Korku Ölçeğinin Türkçe geçerlilik ve güvenilirlik çalışması. Hacettepe Sağlık İdaresi Dergisi. 2020;23(2):261-272.
13. Aydoğan Gedik S, Ünsal A, Arslantas D, Mutlu A. Tıp fakültesi öğrencilerinin tıbbi malpraktis bilgi düzeyi. Osmangazi Tıp Dergisi. 2021;43(2):171-181. https://doi.org/10.20515/otd.745382
14. Katz DA, Williams GC, Brown RL, Aufderheide TP, Bogner M, Rahko PS, et al. Emergency physicians' fear of malpractice in evaluating patients with possible acute cardiac ischemia. Ann Emerg Med. 2005;46(6):525-533. https://doi.org/10.1016/j.annemergmed.2005.04.016
15. Başer A, Başer Kolcu Mİ, Kolcu G, Gök Balcı U. Validity and reliability of the Turkish version of The Defensive Medicine Behaviour Scale: Preliminary study. Anatol J Med. 2014;24(2):99-102. https://doi.org/10.5222/terh.2014.29494
16. Uğrak U. Hekimlerin tıbbi hata algı ve tutumları ile malpraktis korkuları arasındaki ilişkinin değerlendirilmesi. Hacettepe Üniversitesi Sosyal Bilimler Enstitüsü, Sağlık Yönetimi Programı Doktora Tezi, Ankara, 2019. p.120-123.
17. Sheikh A, Ali S, Ejaz S, Farooqi M, Ahmed SS, Jawaid I. Malpractice awareness among surgeons at a teaching hospital in Pakistan. Patient Saf Surg. 2012;6(1):26. https://doi.org/10.1186/1754-9493-6-26
18. Can D, Bayer N. Investigation of the relationship between malpractice fear and job satisfaction among emergency physicians. Harran Üniversitesi Tıp Fakültesi Dergisi. 2023;20(2):340-345. https://doi.org/10.35440/hutfd.1320376
19. Reed DA, Windish DM, Levine RB, Kravet SJ, Wolfe L, Wright SM. Do fears of malpractice litigation influence teaching behaviors? Teaching and Learning in Medicine. 2008;20(3):205-211. https://doi.org/10.1080/10401330802199443
20. Benbassat J, Pilpel D, Schor R. Physicians' attitudes toward litigation and defensive practice: development of a scale. Behav Med. 2001;27(2):52-60. https://doi.org/10.1080/08964280109595771
21. Reschovsky JD, Saiontz-Martinez CB. Malpractice claim fears and the costs of treating medicare patients: A new approach to estimating the costs of defensive medicine. Health Serv Res. 2018;53(3):1498-1516. https://doi.org/10.1111/1475-6773.12660
22. Leape LL. Reporting of adverse events. N Engl J Med. 2002;347(20):1633-1638. https://doi.org/10.1056/NEJMNEJMhpr011493
23. Singer SJ, Gaba DM, Geppert JJ, Sinaiko AD, Howard SK, Park KC. The culture of safety: results of an organization-wide survey in 15 California hospitals. Qual Saf Health Care. 2003;12(2):112-118. https://doi.org/10.1136/qhc.12.2.112
24. Bellandi T, Tartaglia R, Sheikh A, Donaldson L. Italy recognises patient safety as a fundamental right. BMJ. 2017;357:j2277. https://doi.org/10.1136/bmj.j2277
25. Banaz M, Yalçın Balçık P. Hekimlerin defansif tıp tutumlarının incelenmesi. Hacettepe Sağlık İdaresi Dergisi. 2022;25(3):501-516.
26. Catino M, Celotti S. The problem of defensive medicine: two Italian surveys. Stud Health Technol Inform. 2009;148:206-221.
27. Hiyama T, Yoshihara M, Tanaka S, Urabe Y, Ikegami Y, Fukuhara T, et al. Defensive medicine practices among gastroenterologists in Japan. World J Gastroenterol. 2006;12(47):7671-7675. https://doi.org/10.3748/wjg.v12.i47.7671