

## **Evaluation of Defensive Medicine Behaviours in Various Medical Specialties and Titles: A Cross-Sectional Survey Study**

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### **Abstract**

**Objective:** Defensive medicine is increasingly prevalent among physicians worldwide, including in Türkiye. This study aims to explore physicians' views and tendencies regarding defensive medicine, define the concept and practices in light of the literature, and examine the reasons and consequences of such practices.

**Material and Methods:** A cross-sectional survey was conducted among 390 physicians working in Edirne province and its districts, using the Defensive Medicine Practices Attitude Scale.

**Results:** The most common positive defensive medicine practices reported were placing greater emphasis on informed consent forms, keeping more detailed patient records, and providing patients with more thorough explanations of medical procedures. The most common negative defensive practice was avoiding patients perceived as having a high likelihood of initiating legal action. Overall, 85% of the participants stated they were familiar with the concept of defensive medicine. Physicians with lower professional seniority, particularly those working in state or university hospitals, demonstrated a stronger tendency toward defensive practices.

**Conclusion:** This study, in line with previous research, shows that defensive medicine practices are widely adopted among physicians. To reduce these tendencies, it is essential to establish a healthcare system and legal framework that enable physicians to practice in accordance with ethical principles. Addressing the underlying factors driving defensive behaviors and implementing necessary improvements by healthcare authorities are crucial.

**Keywords:** Attitude, defensive medicine, physicians.

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## 1. Introduction

Defensive medicine is defined as "deviations from standard medical practices by physicians to avoid liability and alleviate the fear of being sued" (Baungaard et al., 2022). It is widely believed that defensive medical practices began to emerge in the United States in the 1970s following the malpractice crisis.

Defensive medical practices have two sub-dimensions: positive and negative defensive medicine. In the positive defensive medicine dimension, physicians order unnecessary laboratory and imaging tests, consultations, and admit patients for non-indicated causes, dedicating a significant portion of their time to a more detailed record-keeping. In the negative defensive medicine dimension, physicians avoid high-risk treatment protocols and medically high-risk patients. By taking these actions, physicians believe they can at least avoid the possibility of lawsuits and complaints from high-risk patients, thereby avoiding potential hazards (Summerton, 1995; Clarke & Oakley, 2007; Catino, 2011; Toraman & Çarıkçı, 2019).

In this study, the aim is to determine the views and tendencies of physicians working in different institutions in Edirne, a city in the European part of Türkiye, regarding defensive medicine and to examine the reasons and consequences of defensive medical practices.

## 2. Methods

### 2.1. Sample

During the period of the research, the number of active physicians working in public and private healthcare facilities in Edirne city center and the districts where major healthcare institutions are located was determined to be 1385. Physicians who were not directly involved in the diagnostic and treatment patient care processes in both this and other institutions were not included in the scope of the study (e.g., forensic medicine, nuclear medicine, radiology, medical pharmacology, public health). As a result of this exclusion criteria, the study population consisted of 879 physicians. To determine the number of physicians that would best represent the study population, a power analysis was conducted, taking into account the scale scoring for defensive medical practices from the study by Banaz and Yalçın Balcık (2022) (mean  $\pm$  standard deviation of  $3.27 \pm 0.85$ ). With a 95% confidence interval and a margin of error of 0.085, it was calculated that a minimum of 385 physicians needed to be reached to conduct the study. The study sample, consisting of 390 physicians, was reached between 1st of March and 31st of March 2023, mostly by face-to-face interviews and minority through e-questionnaires.

### *Defensive Medical Practices Attitude Scale*

In order to assess the opinions of physicians regarding defensive medical practices, the "Defensive Medical Practices Attitude Scale" developed by Başer et al. (2014) was utilized, along with the study of its reliability and validity. The scale consists of 18 questions and is structured into three subcategories: positive defensive medicine, negative defensive medicine, and knowledge level. The first 9 questions pertain to positive defensive medical practices, the subsequent five questions address negative defensive medical practices, and the final four questions relate to knowledge levels about the concepts. The first 14 questions are scored based on a 5-point Likert scale, with responses ranging from "1=Strongly Agree" to "5=Strongly Disagree". The last three questions are answered as "1=Yes" or "2=No". The reliability analysis conducted with the data obtained from the research indicated that the Defensive Medical Practices Attitude Scale is a reliable instrument (Cronbach's alpha  $\geq 0.70$ ). Specifically, the Cronbach's alpha value for questions related to positive defensive medicine was found to be 0.786, and for questions related to negative defensive medicine, it was 0.873.

## 2.2. Data Analysis

Statistical analyses were conducted using SPSS 25.0 software. When analyzing the first 14 questions of the Defensive Medical Practices Attitude Scale, descriptive statistics (mean, standard deviation, range, variance, median, minimum value, maximum value) were examined. While examining physicians' attitudes towards positive defensive medicine, the responses of 390 (100.0%) physicians were considered valid, and when examining attitudes towards negative defensive medicine, the responses of 389 (99.7%) physicians were analyzed as 1 (0.3%) physician provided incomplete answers to the questions. The Kruskal-Wallis Test was employed for analyzing independent groups, and the Spearman Correlation Test was used to investigate correlation relationships in the data. Additionally, the Wilcoxon Mann-Whitney test was employed in the research. A significance level of  $p < 0.05$  was considered significant in the analyses.

## 3. Results

Demographic data of the physicians in the study are presented in Table 1. Among the 390 physicians, 171 (44%) were female, and 219 (56%) were male. Of the respondents, 252 (65%) were in the 24-34 age group, 48 (12%) were in the 35-44 age group, 52 (13%) were in the 45-54 age group, 34 (9%) were in the 55-64 age group, and 4 (1%) were in the  $\geq 65$  age group. The mean age was determined to be  $35.59 \pm 10.81$ . In terms of workplace, 105 (26.9%) of the physicians worked in state hospitals, 220 (56.4%) in university hospitals, 33 (8.5%) in private hospitals, and 32 (8.2%) in primary healthcare centers. When examining their titles, it was found that 45 (12%) were general practitioners, 192 (49%) were medical residents, 132 (34%) were specialist physicians, and 21 (5%) were medical school professors.

Additionally, among these physicians, 251 (64.35%) worked in internal medicine departments, 95 (24.35%) in surgical departments, and the remaining 44 (11.28%) did not have a specific medical specialty (General practitioner).

Table 1. Basic Characteristics Of Participants

		n	%
Gender	Woman	171	44
	Man	219	56
Age	24-34	252	65
	35-44	48	12
	45-54	52	13
	55-64	34	9
	$\geq 65$	4	1
Institution	Family health center	32	8.2
	State hospital	105	26.9
	University hospital	220	56.4
	Private hospital	33	8.5
Title	General practitioner	45	12
	Research assistant	192	49
	Specialist	132	34
	Instructor	21	5
Department	Internal medicine branches	251	64.35
	Surgery	95	24.35
	General practitions	44	11.28

Table 2. Average Scores For Questions Related To Positive And Negative Attitudes On The Defensive Medicine Behavior Scale

	Mean	sd.*
<b>Positive defensive medicine</b>	2.43	0.62
1. For legal reasons, I request tests beyond what I deem necessary for patients other than those I feel are necessary.	2.80	1.129
2. For legal reasons, I prescribe most medications within indications to protect myself legally.	2.66	1.087
3. For legal reasons, I request more consultations related to potential complications in my patients.	2.51	1.053
4. For legal reasons, I admit patients for reasons outside of indications (e.g., social indications) to protect myself legally.	3.25	1.175
5. For legal reasons, I prefer to use imaging methods more frequently.	2.48	1.122
6. For legal reasons, I explain medical procedures to my patients in more detail.	1.95	0.898
7. For legal reasons, I allocate more time to my patients than necessary to protect myself legally.	2.46	1.035
8. For legal reasons, I fill out patient records in more detail to protect myself legally.	1.89	0.893
9. For legal reasons, I give more importance to informed consent forms.	1.92	0.885
<b>Negative defensive medicine</b>	2.72	0.92
10. For legal reasons, I avoid patients who are likely to file a lawsuit to protect myself legally.	2.74	1.18
11. For legal reasons, I avoid patients with complex medical problems to protect myself legally.	3.04	1.21
12. For legal reasons, I avoid treatment procedures with high complication rates to protect myself legally.	2.91	1.17
13. For legal reasons, I opt for non-invasive procedures instead of invasive treatments to protect myself legally.	3.00	1.13
14. As issues related to medical malpractice receive more media coverage, I feel anxious about my medical practices.	1.97	0.97
<b>General defensive medicine</b>	2.54	0.62

\*sd: Standard deviation

The values of the responses provided by the participating physicians to the questions in the "Defensive Medical Practices Attitude Scale" are presented in Table 2, the averages of the scores given by the physicians in the study for the questions were evaluated within their respective dimensions. The cutoff point for the scale was determined to be 3 points. Accordingly, averages below <3 indicate that the physicians have a defensive tendency, while averages  $\geq 3$  indicate that the physicians do not have a defensive tendency. When the defensive medicine attitude is evaluated in general, it is concluded that the participating physicians exhibit a defensive attitude in medical practices ( $\bar{x}$ :  $2.54 \pm 0.62$ ).

When the sub-dimension of positive defensive medicine attitude is evaluated, it is observed that physicians exhibit a defensive attitude ( $\bar{x}$ :  $2.43 \pm 0.62$ ). The responses of physicians in the categories of "requesting unnecessary tests, prescribing extra medications, requesting unnecessary consultations, using unnecessary imaging tests, explaining medical procedures in more detail, allocating more time to patients, keeping more detailed patient records, and attaching greater importance to informed consent forms" indicate this tendency. However, it was found that physicians do not exhibit positive defensive medical practices in terms of "admitting patients for reasons outside of indications for legal protection" ( $\bar{x}$ :  $3.25 \pm 1.175$ ).

When the sub-dimension of negative defensive medicine attitude is evaluated, it is observed that physicians again exhibit a defensive attitude ( $\bar{x}$ :  $2.72 \pm 0.92$ ). Most of the participating physicians stated that they feel anxious about their medical practices as issues related to medical malpractice are frequently covered in the media. They also indicated that they "avoid patients with a high probability of filing a lawsuit and/or complex problems for legal protection" and "tend to prefer non-invasive procedures over invasive treatments."

It is noteworthy that the majority of the participating physicians (94%) have not encountered any lawsuit filed with allegations of medical malpractice before, but still, the vast majority (94%) believe that the possibility of such lawsuits affects their medical performance (Table 3).

Table 3. Responses To Questions Measuring Knowledge Levels Related To Defensive Medicine In The Defensive Medicine Behavior Scale

	Yes	No
	n (%)	n (%)
Have you been sued for medical malpractice in your medical career?	22 (%6)	368 (%94)
Do you believe that medical malpractice lawsuits would affect your medical performance?	365 (%94)	25 (%6)
Have you heard of the concept of defensive medicine before?	333 (%85)	57 (%15)
Do you have sufficient knowledge about the concept of defensive medicine?	165 (%42)	225 (%58)

In the analysis of the attitude averages of the physicians in the study regarding defensive medical practices by gender, it was found that the overall defensive medicine attitude and the averages for positive defensive medicine and negative defensive medicine dimensions were quite close to each other, and there was no statistically significant difference by gender ( $p>0.05$ ).

Table 4. Examining Participants' Attitudes Towards Defensive Medicine Behaviors In Relation To The Time Allocated Per Patient

Attitudes towards defensive medicine behaviors	Time allocated per patient	n (%)	Mean	sd*	p <sup>†</sup>
General defensive medicine	<5 min.	38 (%10)	2.34	0.66	0.046
	>5 min.	352 (%90)	2.56	0.61	
Positive defensive medicine	<5 min.	38 (%10)	2.27	0.70	0.139
	>5 min.	352 (%90)	2.45	0.61	
Negative defensive medicine	<5 min.	38 (%10)	2.46	0.97	0.070
	>5 min.	352 (%90)	2.75	0.91	

\*sd: Standard deviation, <sup>†</sup> $p<0.05$ , Wilcoxon–Mann–Whitney test.

Table 4 presents the comparison of the averages of physicians' overall defensive medicine attitude and sub-dimensions according to the time allocated per patient. It is observed that 38 of the participating physicians allocate less than 5 minutes per patient, while 352 allocate more than 5 minutes per patient.

Under the heading of general defensive medicine attitude, there was a statistically significant difference between the two groups, those allocating less than 5 minutes and those allocating more than 5 minutes per patient ( $p<0.05$ ). Physicians who allocate less than 5 minutes per patient tend to exhibit more defensive medicine tendencies. However, similar statistical differences were not observed in the sub-headings of positive and negative attitudes.

The average scores for overall defensive medicine attitudes among physicians were compared in pairs based on the type of healthcare institution they worked in using the Kruskal-Wallis test. According to the results, statistically significant differences were observed in the pairwise comparisons of state hospitals-private hospitals and university hospitals-private hospitals ( $p<0.05$ ). The tendency for defensive behavior can be ranked from highest to lowest as "State Hospital = University Hospital > Family Health Center > Private Hospital".

The relationship between physicians' titles and their defensive medicine approaches was compared using the Kruskal-Wallis test. According to the results, statistically significant differences were observed in the pairwise comparisons of 'general practitioner-specialist

physician,' 'general practitioner-academic staff,' 'medical specialization student-specialist physician,' and 'medical specialization student-academic staff' regarding the average scores for overall defensive medicine attitudes ( $p < 0.05$ ). Physicians' tendencies for defensive behavior can be ranked as "General Practitioner > Medical Specialization Student > Specialist Physician > Academic Staff."

The comparison of average scores for overall defensive medicine attitudes among participating physicians by specialty using the Kruskal-Wallis test revealed a statistically significant difference in the pairwise comparisons of "internal medicine-specialist" and "surgical medicine-specialist" groups ( $p < 0.05$ ). Physicians' tendencies for defensive behavior can be ranked as "General Practitioners > Surgical Medicine Specialists > Internal Medicine Specialists."

#### 4. Discussion

Defensive medical practices are a challenging concept to measure due to being a behavioral model exhibited by physicians during medical procedures. The inclination towards general, positive, and negative defensive medical attitudes to protect against legal issues can vary from country to country and among different medical specialties, as documented in studies (Moosazadeh et al., 2014; Renkema et al., 2019). Research findings indicate substantial variation in the frequency of defensive medical practice between countries, such as 6.7% among neurosurgeons in the Netherlands and 99.8% among general practitioners in Iran (Moosazadeh et al., 2014; Calikoglu & Aras, 2020; Renkema et al., 2019). It is evident that differences in sociocultural factors and healthcare systems among countries contribute to these varying rates.

Various studies conducted in different countries and at different times, as well as survey studies targeting specific medical specialties, have revealed variations in the frequency of defensive medicine and its subtypes. When examining these studies, it has been observed that the general inclination towards defensive medicine ranges from 51% to 98%, the inclination towards positive defensive medicine varies from 32% to 98%, and the inclination towards negative defensive medicine falls within the range of 30% to 96% (Hiyama et al., 2006; Williams et al., 2021; Yan et al., 2017). In our study, the frequency of general defensive medicine inclination was found to be 54%, positive defensive medicine inclination was 61%, and negative defensive medicine inclination was 46%, which aligns with findings from other studies.

The literature supports the notion that defensive medical tendencies are more common among young doctors due to their lack of professional experience (Catino, 2011). Studies examining the impact of age on defensive behavior tend to find that doctors under the age of 40 have a significantly higher rate of practicing defensive medicine compared to those aged 40 and above (Catino, 2011; Solaroglu et al., 2014; Elli et al., 2013; Saraç, 2020). Among the healthcare professionals who participated in our research, 252 (65%) fell within the 24-34 age group, and 49% were young doctors pursuing specialization training. The average years of professional experience in our study population were calculated to be 10.91. Consistent with studies in this field, our research found that as doctors' ages and years of experience increased, their tendencies to exhibit general and positive defensive behaviors decreased. Additionally, our study observed that the practice of positive defensive medicine, particularly in the form of overprescribing, was more prevalent among doctors with less than 10 years of experience in the medical profession.

In the literature, when doctors' tendencies towards defensive medicine are evaluated based on their titles, it has been observed that as academic titles and experience levels decrease, positive, negative, and general defensive behaviors tend to increase (Akdur, 2013; Özgün, 2020). Similarly, our study also found that general practitioners and medical students pursuing specialization training exhibited a higher inclination towards defensive behavior compared to

specialist doctors and faculty members. As doctors' professional experience (academic titles) increases, they seem to require less defensive approaches in their clinical behavior and practices. It has been noted that as doctors' titles rise, their rates of making requests for non-indicated reasons decrease, and lower-ranking doctors tend to avoid patients with a higher potential for filing lawsuits and complaints (Sarıcaoğlu et al., 2013). Consistently, in our study, the most frequent occurrence of negative defensive behavior, characterized by avoiding patients with a high potential for filing lawsuits and complaints, was observed among general practitioners, followed by medical students pursuing specialization, specialist doctors, and faculty members. It appears that doctors' tendencies to avoid patients with a high potential for legal action or complaints decrease depending on their specialization area and professional experience.

The World Health Organization recommends allocating a minimum of 20 minutes per patient. The Turkish Medical Association also emphasizes that a physician should spend at least 15-20 minutes with each patient to provide quality healthcare. In Türkiye, the Central Physician Appointment System in hospitals under the Ministry of Health schedules appointments for physicians with a frequency of one appointment every 10 minutes, resulting in only 5 minutes allocated to each patient (Turkish Medical Association Central Council, 2016). Studies conducted in the United States and the United Kingdom have stated that the time allocated to outpatient visits should not be less than 10 minutes, especially for complex medical conditions, and insufficient time per patient can have adverse effects on the quality of healthcare provided (Yardımcı & Eser, 2017). In our study, assuming a daily outpatient service duration of 8 hours, calculations based on the average number of patients cared for by participating doctors revealed that 150 doctors (38%) spent at least 20 minutes per patient, while 240 doctors (62%) spent less than 20 minutes. Among the doctors in our sample, only 38 spent less than 5 minutes per patient, and it was found that 25 of these doctors worked in state hospitals. The number of doctors who spent less than 5 minutes per patient is estimated to be higher than indicated in the survey. Doctors who spent less than 5 minutes per patient were found to have a statistically significant ( $p < 0.05$ ) higher general defensive medicine tendency compared to those who spent more than 5 minutes per patient. The increasing number of patients, the system in Ministry of Health-affiliated organizations that schedules appointments every 5 minutes, and patients' increased tendency to file complaints against doctors can lead to doctors becoming more defensive over time. As the time allocated per patient decreases, doctors tend to deviate from physical examinations, order excessive tests, make decisions mostly based on patient complaints and test results, and frequently resort to symptomatic treatment methods. This situation can lead to patient dissatisfaction and contribute to professional burnout among doctors, creating a vicious cycle.

In our study, the most frequently practiced positive defensive behaviors by doctors were found to be keeping more detailed patient records (82%), providing more detailed explanations of medical procedures to patients (82%), and placing greater importance on informed consent forms (80%). Similar results have been found in three separate studies conducted in our country (Başer et al., 2014; Göçen et al., 2018; Altındaş et al., 2019). This situation can be explained by the fact that the legal system places importance on doctors maintaining detailed patient records when evaluating the fault of doctors in malpractice lawsuits and that one of the necessary prerequisites for a medical procedure to be legally accepted is the presence of informed consent, which is explained to the patient in a way they can understand.

In other countries, doctors most commonly exhibit negative defensive medical attitudes by avoiding high-risk medical procedures, turning to non-interventional treatment protocols, and refraining from accepting and treating high-risk patients (Yan et al., 2017; Nahed et al., 2012;

Panella et al., 2016). In studies conducted in our country, as among the doctors participating in our study (Başer et al., 2014; Göçen et al., 2018), the most common negative defensive inclination observed is avoiding high-risk patients (42%), followed by avoiding treatment protocols with high complication rates (41%). This is believed to stem from doctors feeling uneasy during their professional practices due to the frequent coverage of medical malpractice claims in the media (79%). Negative defensive behaviors such as avoiding patients with complex problems (35%) and preferring non-invasive protocols over invasive ones (35%) are found to be the least frequently used negative defensive medical attitudes by doctors in other studies and in our study as well (Göçen et al., 2018; Panella et al., 2016; Ali et al., 2016). The attitude of doctors not avoiding patients with complex problems while avoiding patients with a high likelihood of filing a lawsuit can be interpreted as an indicator of their commitment to patient welfare from a professional ethics perspective.

While similar studies have reported that the awareness of doctors about the concept of defensive medicine varies between 42.5% and 88%, the rates of having sufficient knowledge about the concept (20–54%) are relatively low (Göçen et al., 2018; Selçuk, 2015; Kalkan et al., 2020). Similarly, in our study, 85% of doctors stated that they had heard of the concept of defensive medicine, but only 42% believed they had sufficient knowledge about the concept. We interpret this situation as the fear climate created by the concept of malpractice among doctors and the demanding working conditions being obstacles to a more in-depth examination of the subject by doctors.

In our study, there was no statistically significant difference in general, positive, and negative defensive medicine tendencies between the groups of doctors who had heard of and knew about the concept of defensive medicine and those who had not heard of or did not know about it. However, in a different study, unlike our findings, it was observed that doctors who had heard of and knew about the concept of defensive medicine had statistically significantly increased tendencies to place more importance on records and adopt more defensive approaches to avoid verbal/physical violence (Selçuk, 2015). Another study conducted in Türkiye found no statistically significant relationship between doctors who expressed having heard of defensive medicine and those who had not in terms of their defensive medicine scores. However, in the same study, a statistically significant relationship was found between the groups of doctors who were aware of and unaware of the concept of defensive medicine, with doctors who were not sufficiently knowledgeable about the concept of defensive medicine having higher defensive medicine score averages (Biçen, 2018).

In our study, it was observed that 94% of the doctors felt anxious about their medical practices as medical malpractice cases were frequently covered in the media. Similar studies in the literature have also shown that this rate reaches the 90s (Ali et al., 2016; Selçuk, 2015; Yeşiltaş & Erdem, 2018). The way medical malpractice cases are reported in the media, concerns about not wanting to be material for the media, fear of losing credibility, potential legal battles, and financial losses are thought to contribute to defensive medical practices.

In our study, it was determined that lawsuits were filed against 22 doctors (6%) due to medical malpractice. In studies conducted in our country, it has been found that 7–24% (Başer et al., 2014; Göçen et al., 2018) of doctors have faced lawsuits, while in other countries, this rate varies between 25–88% (Zarei et al., 2019; Tebano et al., 2018). Although the rates of lawsuits due to medical malpractice are significantly lower in our country compared to other countries, the level of defensive medical practices in our study and other studies conducted in our country is similar to those in other countries (Göçen et al., 2018).

## 5. Conclusion

Studies conducted both globally and in Türkiye have observed an increase in defensive medical tendencies. The transformation program in healthcare, which has led to a shift away from preventive healthcare services, the elimination of referral chains, patients' unrestricted right to choose any healthcare facility, the accumulation of patients in secondary and tertiary care hospitals, the increase in the number of patients seen daily, and the decrease in the time allocated to each patient have all contributed to patient dissatisfaction. As the time allocated per patient decreases, a physician's ability to establish good communication with the patient is negatively affected, and the trust relationship weakens. Patients whose expectations are not met can easily file complaints against physicians, which can lead to a loss of motivation among healthcare professionals. Additionally, legal processes related to allegations of medical malpractice are often reported in the media before the legal proceedings are concluded, with the media sensationalizing these cases more than warranted. This increased media attention can lead to a rise in lawsuits against healthcare professionals and incidents of violence against them. The high compensation amounts for medical malpractice claims, relative to physician incomes, can place significant financial burdens on healthcare professionals in the event of a potential error. We believe that the failure of the healthcare authorities to make the necessary improvements to address these known issues has driven healthcare professionals, working within the current system, to resort to defensive medicine as a means of self-protection.

**Ethical Approval:** The study was conducted in accordance with the principles of the Declaration of Helsinki. The ethical approval was obtained from the Trakya University Faculty of Medicine Non- Interventional Scientific Research Ethics Committee (approval date: November 28, 2022, research protocol code: 2022/384).

**Source of Finance:** During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

**Conflict of Interest:** No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

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