

# Defensive Medicine in Family Physicians

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**Abstract.** *Study Objectives:* In this study, it is aimed to evaluate the attitudes of family physicians regarding defensive medicine. *Methods:* The study was designed as a cross-sectional study. In the study defensive medicine attitude scale is used. *Results:* 196 family physicians participated in the study. Scale raw scores average was calculated as  $40.55 \pm 8.30$ . According to total scores, 4.6% (n: 9) low, 55.6% (n: 109) medium, and 39.8% (n:78) applied high levels of defensive medicine. When the defensive medicine attitude scale score was evaluated, a statistically significant relationship was found between the participants with high defensive medicine attitude level and those who think that malpractice case will be opened in the future (p: 0.001). *Conclusion:* As a result the knowledge level of family physicians on the concept of defensive medicine is not enough. Increasing the knowledge level of family physicians on the concept of defensive medicine will contribute to patient safety and will decrease the financial burden on healthcare service by decreasing the fear of being sued.

**Key words:** Family Medicine, Defensive Medicine, Malpractice

## Introduction

Defensive medicine is the term for behavior concerning protection from legal problems in physicians. This behavior has been conducted for decades and spreads like an epidemic, leading to increased costs of healthcare delivery as well as defensive and avoidance behavior in physicians (1,2). Defensive medicine is divided into two main aspects: positive and negative. While cost-increasing behavior in healthcare delivery is called positive defensive medicine practices, avoidance and defensive behavior are regarded as the negative aspect.

Defensive medicine practices are often discussed because of their negative effects on patient safety and the financial burden they put on healthcare delivery(3,4). There are many international and national studies in the literature on the frequency of defensive medicine. (5–9). In addition, defensive medicine practices have been shown to be common in studies related to defensive medicine practices in primary care and

family physicians (10,11). Of the total patients admitted to health facilities in Turkey, 70%, is health care from family physicians. Therefore, the effects of defensive medicine on the health system are mostly determined by the behavior of family physicians. In this context, the aim of this study was to evaluate the attitude of family physicians towards defensive medicine.

## Materials and Methods

The study was designed as a cross-sectional descriptive study in the quantitative research design. The approval for this study was granted by Süleyman Demirel University Non-Invasive Clinical Research Ethics Committee with the number 65 and dated 27.02.2020. The study universe was determined as family physicians, specialists on family practice in Tekirdağ province (N: 210). Sample selection was not conducted for the study, and the aim was to reach all physicians (n: 196) (The rate of reaching the universe:

93.33%). The defensive medicine attitude scale developed by Kolcu et. al was used in the study (6,12,13). The defensive medicine attitude scale was sent to all family physicians as an online form. The data were analysed using MS-Excel, Amos and SPSS software.

Cronbach's Alpha for the internal consistency of the scale was calculated to be 0.838. According to the generalizability theory, the G coefficient was calculated as 0.84 in the reliability analysis (Table 1).

The KMO (Kaiser-Meyer-Olkin; Test for Sampling Adequacy) of the scale was calculated to be 0.83, while Bartlett's test of sphericity was 0.000. These results were evaluated as factorable at a good level, and

exploratory factor analysis was performed. In the exploratory factor analysis, the scale was divided into 3 factors as cost-increasing behavior, defensive behavior and avoidance behavior. While the cost-increasing behaviour (items 1, 2, and 3) within these factors corresponded to the definition of positive defensive medicine, it was observed that negative defensive medicine was divided into two groups as defensive behavior (items 4, 5, and 6) and avoidance behavior (items 7, 8, 9, 10, and 11) (Table 2).

Several goodness of fit indices were calculated and cut-off values were determined to improve the interpretation of each index: CFI (Comparative Fit

**Table 1:** The reliability analysis according to the generalizability theory of the scale

Source	SD	Df	MS	Components				
				Random	Mixed	Corrected	%	SE
Individual	1223.30	195	6.27	0.47	0.47	0.47	28.9	0.05
Item	320.69	10	32.06	0.15	0.15	0.15	9.6	0.06
Individual/ Item	1985.66	1950	1.018	1.01	1.01	1.01	61.5	0.03
Total	3529.67	2155					100%	

S.D.: Standard Deviation, Df: Degree of Freedom, MS: Mean Square, SE: Standard Error

**Table 2:** Exploratory factor analysis of the scale

Propositions	Positive Defensive Medicine	Negative Defensive Medicine	
	Cost-Increasing Behavior	Defensive Behavior	Avoidance Behavior
1. I order tests other than what I think is necessary for my patients in order to protect myself from legal problems,	.558		
2. I prescribe most of the drugs that I can in line with patients' indications in order to protect myself from legal problems,	.498		
3. I demand more consultations in order to protect myself from legal problems,	.583		
4. I explain medical practices in great detail to my patients in order to protect myself from legal problems,		.615	
5. I allocate more time to my patients in order to protect myself from legal problems,		.637	
6. I keep the records in more detail in order to protect myself from legal problems,		.260	
7. I avoid patients who are more likely to file a lawsuit in order to protect myself from legal problems,			.827
8. I avoid patients with complex medical problems in order protect myself from legal problems,			.807
9. I avoid treatment protocols with high complication rates in order to protect myself from patients,			.733
10. I have a tendency to choose non-interventional procedures instead of interventional procedures in order to protect myself from legal problems,			.694
11. I feel uncomfortable with my medical practices as the number of malpractice cases covered in the media increases,			.572

Index) > 0.90 is considered good (14), RMSEA (Root Mean Square Error of Approximation) < 0,05 and adequate fit < 0,08 (15)) and SRMR ≤ 0,08 (14) it is considered to be a good fit with its values. In the confirmatory analysis, a model with 3 sub-dimensions was also created, and fit indices were shown to be at an “acceptable” level. Moreover, confirmatory factor analysis was conducted for these factors in structural equation modelling (Table 3).

The scale that was developed in order to measure and evaluate defensive medicine practices was composed of sociodemographic data, and items about positive and negative defensive medicine. The scale was created and applied Turkish, the language of the participants. The validity and reliability test was performed by Kolcu et al. Likert scale was used in organizing choices in items measuring attitude (6,7). Statements each representing 20% of groups such as “Strongly disagree, → Disagree, → Undecided, → Agree, → Strongly agree” was used for 11 items meas-

uring the level of positive and negative medicine behavior. These statements were scored as strongly disagree (1 point), disagree (2 points), I am undecided (3 points), agree (4 points), and strongly agree (5 points). Total scores were grouped into different levels as 11-23 (low), 24-41 (medium), and 44-55 (high). Yes-no options each representing 50% of groups were preferred for items 12, 13, 14, and 15 regarded as independent variables (6,13).

Descriptive statistics were used in statistical analyses, and tables were formed by calculating the percentage distribution of priorities. T-test was used in independent groups for comparison.

**Results**

196 family physicians participated in the study (n:196). The mean age of these physicians was 37.00 ± 10.09 (min: 24, max: 60), while 103 of them (52.6%)

**Table 3:** Confirmatory factor analysis of the scale

Analysed Fit Indices	Perfect Fit	Acceptable Fit	Fit Indices Obtained from the First Level of CFA	Conclusion	Structural Equation Model Model Sub-Dimensional Analysis
$\chi^2/sd$	$0 \leq \chi^2 / sd \leq 2$	$2 \leq \chi^2 / sd \leq 3$	2.14	Acceptable	
RMSEA	$.00 \leq RMSEA \leq .05$	$.05 \leq RMSEA \leq .10$	0.77	Acceptable	
CFI	$.95 \leq CFI \leq 1.00$	$.90 \leq CFI \leq .95$	0.93	Acceptable	
NFI	$.95 \leq NFI \leq 1.00$	$.90 \leq NFI \leq .95$	0.90	Acceptable	
GFI	$.95 \leq GFI \leq 1.00$	$.90 \leq GFI \leq .95$	0.92	Acceptable	

$\chi^2$ : Model Chi-square, RMSEA: The Root Mean Square Error of Approximation, CFI: Comparative Fit. Index, NFI: Normed Fit Index, GFI: Goodness of Fit

were male, and 93 (47.4%) were female. 156 of these physicians (79.6%) were family physicians, and 40 (20.4%) were specialists on family practice and students on family practice specialization, while the average time they spent within patient-physician communication was  $11.48 \pm 9.93$  (min:1, max:36). 92.3% of these physicians had not been sued for malpractice, 56.6% thought that they would be sued for malpractice in the malpractice while 78.1% had heard about the concept of defensive medicine, and 67% thought that they did not have sufficient information on the content of defensive medicine (Table 4).

In the study, the majority of participants responded under the category of “strongly agree” or “agree” on the following propositions: proposition 2 “I prescribe most of the drugs that I can in line with patients’ indications in order to protect myself from legal problems” (55.1%), proposition 3 “I demand more consultations in order to protect myself from legal problems” (60.2%), proposition 4 “I explain medical practices in great detail to my patients in order to protect myself from legal problems” (68.3%), proposition 6 “I keep the records in more detail in order to protect myself from legal problems” (69.4%), proposition 7 “I avoid patients who are more likely to file a lawsuit in order to protect myself from legal problems” (57.6%), proposition 8 “I avoid patients with complex medical problems in order to protect myself from legal problems” (55.1%), proposition 9 “I avoid treatment protocols with high complication rates in order to protect myself from patients” (69.4%), proposition 10 “I have a tendency to choose non-interventional procedures instead of interventional procedures in order to protect myself from legal problems” (63.8%), and proposition 11 “I feel uncomfortable with my medical practices as the number of malpractice cases covered in the media increases” (92.4). Moreover, in the study, the majority of participants responded under the category of

“I am undecided”, “disagree”, and “strongly disagree” on the following propositions: proposition 1 “I want tests other than what I think is necessary for my patients in order to protect myself from legal problems” (56.6%) and proposition 5 “I allocate more time to my patients in order to protect myself from legal problems” (61.7%) (Table 5).

Scale raw scores mean was calculated as  $40.55 \pm 8.30$  (min: 11, max: 55). When the raw scores were evaluated according to sub-dimensions of the scale, it was observed that the mean of cost-increasing behavior sub-dimension was  $10.15 \pm 3.03$  (min: 3, max: 15) and the mean of defensive behavior sub-dimension was  $10.98 \pm 2.61$  (min: 3, max: 15) while the mean of avoidance behavior sub-dimension was calculated as  $19.40 \pm 4.73$  (min: 5, max: 25) (Table 6).

When total points were grouped into different levels as 11-23 (low), 24-41 (medium), and 44-55 (high), it was observed that 4.6% (n:9) conducted defensive medicine at low level, and 55.6% (n:109) conducted it at medium level while 39.8% (n:78) conducted it at high level. There was no statistically significant difference among groups when gender, status, the case of filing a lawsuit in case of a medical malpractice, the case of hearing about defensive medicine practices, and having training on defensive medicine were evaluated according to scale total score and sub-dimensions. When the score of defensive medicine behavior and its sub-dimensions were evaluated, a statistically significant relation was found between participants who had a higher level of defensive medicine behavior and those thinking that they would be sued for malpractice in the future (p:0.001) (Table 7).

## Discussion

In this study the knowledge level of family physicians on the concept of defensive medicine was not

**Table 4:** Analysis of independent variables

	Yes	No
Has a lawsuit been filed against you in your medical career due to malpractice?	7.7% (n: 15)	92.3% (n: 181)
Do you think that you will be sued for malpractice in the next 10 years?	56.6% (n: 111)	43.4% (n: 85)
Have you heard of the concept of defensive medicine practices before?	78.1% (n: 153)	21.9% (n: 43)
Do you have sufficient information about the content concerning the concept of defensive medicine practices?	32.1% (n: 63)	67.9% (n: 133)

**Table 5:** Analysis of scale propositions

	Strongly disagree	Disagree	Undecided	Agree	Strongly agree	$\bar{X}$	SD
1. I order tests other than what I think is necessary for my patients in order to protect myself from legal problems,	18.4% (n:36)	14.8% (n:29)	23.5% (n:46)	24.0% (n:47)	19.4% (n:38)	3.11	1.37
2. I prescribe most of the drugs that I can in line with patients' indications in order to protect myself from legal problems,	10.2% (n:20)	13.8% (n:27)	20.9% (n:41)	31.6% (n:62)	23.5% (n:46)	3.44	1.26
3. I demand more consultations in order to protect myself from legal problems,	8.7% (n:17)	10.7% (n:21)	20.4% (n:40)	32.1% (n:63)	28.1% (n:55)	3.60	1.24
4. I explain medical practices in great detail to my patients in order to protect myself from legal problems,	5.1% (n:10)	6.1% (n:12)	20.4% (n:40)	31.6% (n:62)	36.7% (n:72)	3.88	1.12
5. I allocate more time to my patients in order to protect myself from legal problems,	11.7% (n:23)	17.9% (n:35)	32.1% (n:63)	19.9% (n:39)	18.4% (n:36)	3.15	1.25
6. I keep the records in more detail in order to protect myself from legal problems,	3.6% (n:7)	7.7% (n:15)	19.4% (n:38)	29.1% (n:57)	40.3% (n:79)	3.94	1.10
7. I avoid patients who are more likely to file a lawsuit in order to protect myself from legal problems,	13.8% (n:27)	10.7% (n:21)	17.9% (n:35)	20.9% (n:41)	36.7% (n:72)	3.56	1.42
8. I avoid patients with complex medical problems in order to protect myself from legal problems,	10.7% (n:21)	10.2% (n:20)	24.0% (n:47)	20.9% (n:41)	34.2% (n:67)	3.57	1.33
9. I avoid treatment protocols with high complication rates in order to protect myself from patients,	6.1% (n:12)	5.1% (n:10)	19.4% (n:38)	31.1% (n:61)	38.3% (n:75)	3.90	1.15
10. I have a tendency to choose non-interventional procedures instead of interventional procedures in order to protect myself from legal problems,	7.1% (n:14)	7.7% (n:15)	21.4% (n:42)	24.5% (n:48)	39.3% (n:77)	3.81	1.23
11. I feel uncomfortable with my medical practices as the number of malpractice cases covered in the media increases,	2.0% (n:4)	1.5% (n:3)	4.1% (n:8)	23.5% (n:46)	68.9% (n:135)	4.55	0.81

$\bar{X}$  : Mean; S.D.: Standard Deviation

**Table 6:** Analysis of scale scores

	N	Min	Max	$\bar{X}$	SD
<b>Total Score</b>	196	11.00	55.00	40.55	8.30
<b>Cost-Increasing Behavior (CIB)</b>	196	3.00	15.00	10.15	3.03
<b>Defensive Behavior (DB)</b>	196	3.00	15.00	10.98	2.61
<b>Avoidance Behavior (AB)</b>	196	5.00	25.00	19.40	4.73

$\bar{X}$  : Mean; S.D.: Standard Deviation

**Table 7:** Evaluation of independent variables according to scale scores

	Gender	Status	The case of filing a lawsuit due to malpractice	Thinking that they will be sued	The case of hearing about DM	Having training on DM
<b>Total Score</b>	p:0.793	p:0.636	p:0.58	<b>p:0.000**</b>	p:0.237	p:0.109
<b>Cost-Increasing Behavior (CIB)</b>	p:0.584	p:0.715	p:0.254	<b>p:0.001**</b>	p:0.925	p:0.472
<b>Defensive Behavior (DB)</b>	p:0.936	p:0.629	p:0.142	<b>p:0.002**</b>	p:0.059	p:0.070
<b>Avoidance Behavior (AB)</b>	p:0.415	p:0.471	p:0.80	<b>p:0.000***</b>	p:0.414	p:0.212

\*p<0.05

enough. Defensive medicine was found at a moderate level in family physicians, and the relationship between fear of being sued and defensive medicine was recently revealed “defensive behavior” of the physician in defensive medicine is regarded as a sub-dimension of negative defensive medicine. Most of them were thinking that they can be sued for malpractice in the future.

Defensive medicine is the cost-increasing, defensive or avoidance behavior displayed by physicians in healthcare delivery in order to protect themselves from legal problems. Defensive medicine is often evaluated in terms of both costs and patient safety. (16–18). There are many studies in the literature demonstrating high rates of defensive medicine. (5,19). There are many studies on defensive medicine in our country. (6–9,20,21). Most of these studies mentioned high rates of defensive medicine (6–9,20,21). In addition, it has been demonstrated that there are defensive medicine practices in primary care in studies on defensive medicine (10,11,22). Our study aimed to determine the attitude of family physicians regarding defensive medicine.

196 family physicians participated in the study (n:196). The mean age of these physicians was  $37.00 \pm 10.09$  (min: 24, max: 60) while 103 of them (52.6%) were male, and 93 (47.4%) were female. 156 of these physicians (79.6) were family physicians, and 40 (20.4%) were specialists on family practice and students on family practice specialization, while the average time they spent within patient–physician communication was  $11.48 \pm 9.93$  (min:1, max:36).

Although it was rather difficult to measure the attitude regarding defensive medicine, this study aimed to evaluate the attitude of physicians towards defensive medicine. 93.3% of the sample were accessed in the cross-sectional descriptive study designed as a quantitative design. The defensive medicine attitude scale developed by Kolcu was used in the study (6,12,13). It was observed that the scale was at a good level (between 0.8–0.9) in the reliability analyses for internal consistency. The scale was evaluated as factorable, and exploratory factor analysis was performed. While defensive medicine was divided into two groups as positive and negative in the literature, defensive medicine was divided into three as-

pects as cost-increasing behavior, defensive behavior, and avoidance behavior in our study. While the cost-increasing behavior in these factors corresponded to the definition of positive defensive medicine, it was seen that negative defensive medicine was divided into two groups as defensive behavior and avoidance behavior. In addition, a model was also created using 3 sub-dimensions of the scale in the confirmatory factor analysis, and this model was shown to be at an acceptable level with fit indices.

One of the important areas of discussion is the fact that defensive medicine increases healthcare costs (3–5,8,23). While the fact that the majority of participants stated negative comments on proposition 1 “I want tests other than what I think is necessary for my patients in order to protect myself from legal problems” in our study demonstrates that the financial burden of defensive medicine is relatively low in our population, and the fact that the majority of participants stated positive comments on proposition 2 “I prescribe most of the drugs that I can in line with patients’ indications in order to protect myself from legal problems” and proposition 3 “I demand more consultations in order to protect myself from legal problems” demonstrates that defensive medicine increases costs.

In our study, “defensive behavior” of the physician in defensive medicine is regarded as a sub-dimension of negative defensive medicine. Even though the majority of participants stated negative comments on proposition 5 “I allocate more time to my patients in order to protect myself from legal problems”, the majority of participants stated positive comments on proposition 4 “I explain medical practices in great detail to my patients in order to protect myself from legal problems” (68.3%) and proposition 6 “I keep the records in more detail in order to protect myself from legal problems”. This supports the fact that physicians show a defensive behavior in fear of being sued, leading to defensive medicine.

One of the reflections of medical malpractice cases on physicians is avoidance behavior. (4,8,24). In our study, the majority of participants stated positive comments on proposition 7 “I avoid patients who are more likely to file a lawsuit in order to protect myself from legal problems”, proposition 8 “I avoid patients with complex medical problems in order protect my-

self from legal problems”, proposition 9 “I avoid treatment protocols with high complication rates in order to protect myself from patients”, proposition 10 “I have a tendency to choose non-interventional procedures instead of interventional procedures in order to protect myself from legal problems”, and proposition 11 “I feel uncomfortable with my medical practices as the number of malpractice cases covered in the media increases”. Avoidance behavior caused by the fear of being sued leads to work-related tension, emotional exhaustion, and depersonalization (24). This will often be discussed in the following years as a threat to physician health and patient safety.

Medical specialties are divided into two groups as high-risk and low-risk in terms of medical malpractice cases. (7,13,24). Family practice is considered low-risk in terms of medical malpractice cases. In our study, when total scores were grouped into different levels as 11-23 (low), 24-41 (medium), and 44-55 (high) according to scale raw scores mean, it was observed that family physicians conducted defensive medicine “at medium level” in accordance with the literature (10,25). The low risk of being sued leads to a decrease in the fear of being sued, thereby leading to relatively less defensive behavior.

The fear of being sued is often mentioned in the concept of defensive medicine. (4,16,18,26,27). In addition, the majority of physicians state that they may conduct defensive medicine in order not to be sued. 92.3% of physicians were not sued for malpractice in our study, 56.6% of them thought they might be sued for malpractice in the next 10 years, and a statistically significant relation was found between participants who had a higher level of defensive medicine behavior and those thinking that they would be sued for malpractice in the future when the score of defensive medicine behavior and its sub-dimensions were evaluated ( $p:0.001$ ). In this context, the relationship between the fear of being sued and defensive medicine practices becomes clear. Moreover, the majority of family physicians in our study had heard of the concept of defensive medicine; however, most of them thought they did not have sufficient information on the content of defensive medicine.

## Conclusions

As a result, the knowledge level of family physicians regarding the concept of defensive medicine should be increased. We believe that this increase in knowledge level will contribute to patient safety and reduce the financial burden on healthcare services by reducing the fear of being sued. Defensive medicine was found to be moderate in family physicians. This leads to an increase in defensive medicine with the fear of being sued. For this reason, we recommend that the concepts of malpractice and defensive medicine should be mentioned in continuous career development programs in family medicine and that training should be focused on this subject.

**Conflicts of interest:** The authors declare that there is no conflict of interest in this manuscript.

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