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The effect of COVID-19 epidemic on the sexual function of healthcare professionals

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Abstract

Studies have shown that healthcare professionals struggling with epidemics develop symptoms of post-traumatic stress disorder. The aim of this study is to show how often and severely erectile dysfunction, one of the components of post-traumatic stress disorder, is seen among healthcare professionals during COVID-19 outbreak. The Impact of Event Scale-Revised (IES-R) and the Index of Erectile Function-5 (IIEF-5) were applied to 159 male healthcare professionals working in COVID-19 units and a control group of 200 people. Healthcare professional group was divided into sub-groups according to occupation (physician, nurse), age-group (18–25, 26–30, >30), marital status and unit of work (Suspected Patient Area, Diagnosed Patient Area). Both stress disorder and erectile dysfunction were seen at higher rates in healthcare professionals group ($p < .001$). The median IIEF-5 scores of nurses, married subjects and those working in the Diagnosed Patient Area, were found to be higher ($p < .001$, $p = .014$, $p = .011$ respectively). During the COVID-19 outbreak, healthcare professionals are exposed to psychological trauma and their sexual function may be negatively affected. The measures to be taken are important to estimate which groups are more affected.

KEYWORDS
Coronavirus, COVID-19, erectile dysfunction, healthcare professional, post-traumatic stress

1 | INTRODUCTION

On 30 December 2019, several pneumonia cases of unknown aetiology were reported in Wuhan, Hubei Province, China. The agent, which appeared to be a virus from the coronavirus family, was called SARS-CoV-2. On 11 February 2020, the World Health Organization named the clinical condition caused by this new coronavirus Corona Virus Disease-2019 (COVID-19) (Liu et al., 2020). This quickly became a global epidemic. With increasing numbers of infected subjects and deaths, many patients and HCP experienced both physical pain and major psychological trauma (Bo et al., 2020).

Post-traumatic stress disorder (PTSD) is a psychological imbalance following exposure to traumatic events. People with PTSD often experience recurrent traumatic events, show avoidance behaviour and become frustrated (Blake et al., 1995). The symptoms of PTSD follow traumatic events outside the normal range of human experience, such as severe physical attacks, torture, accidents, rape or natural disasters. The typical symptom pattern of PTSD is characterised by persistence of trauma in the mind, avoidance of related stimuli, emotional drowsiness and physiological overstimulation (Deja et al., 2006). Additionally, it has been shown that sexual dysfunction may be observed in PTSD patients (Badour et al., 2015). Considering that long-term traumatic exposures are more strongly associated with PTSD than shorter-term exposures, epidemics affect the health of healthcare providers more significantly than disasters, where exposure is shorter (Kaysen

et al., 2003). HCP directly involved in the diagnosis, treatment and care of patients with COVID-19 are at risk of developing psychological distress and psychiatric symptoms. An increasing number of suspected and confirmed cases, a heavy workload, a lack of protective equipment, a lack of specific medicines and poor psychological support may all increase the mental burden of HCP (Lai et al., 2020). Recent studies show that emotional numbness (emotional numbing) can prevent emotional intimacy and connectedness with a spouse, so PTSD symptoms can cause problems in sexual functions, and PTSD can be used as a predictive parameter for sexual dysfunction in these patients (Letica-Crepulja et al., 2019). Many studies found that the prevalence of sexual dysfunction is higher in PTSD patients compared with the general population. Sexual dysfunction can occur in almost all areas of sexuality, such as activity, desire, arousal, orgasm and satisfaction with sex life. The most common sexual dysfunctions in these patients are erectile dysfunction (ED) and premature ejaculation (Antičević & Britvić, 2008).

The aim of this study was to determine the prevalence and severity of PTSD-related ED among HCP working in COVID-19 units using the International Index of Erectile Function (IIEF-5) scale and to analyse potential risk factors related to this. It was considered useful to clarify how exposure to an epidemic of a life-threatening infectious disease influenced the sexual life of HCP.

2 | PATIENTS AND METHODS

2.1 | Study design and participants

In Van Training and Research Hospital, three separate units were specified for follow-up and treatment plans for patients suspected of having and those diagnosed with COVID-19 infection. These included the 'suspected patient area', which was in the emergency unit for first admission, and the 'quarantine-treatment units' and 'COVID-19 intensive care unit' for the possible case definition determined by the Ministry of Health of the Republic of Turkey. (T.C. Sağlık Bakanlığı Halk Sağlığı Genel Müdürlüğü (2020), 14 April 2020) In the study, the 'quarantine-treatment units' and 'COVID-19 intensive care unit' were defined as the diagnosed patient area. The units where employees worked were categorised as 'suspected patient area' and 'diagnosed patient area'.

Follow-up and treatment of patients in the suspected patient area are performed by emergency specialists, general practitioners and basic medical doctors. All the remaining specialists work in the quarantine units and the COVID-19 intensive care units. Treatment coordination of patients in quarantine hospitals and intensive care units is performed by infectious disease specialists. Nurses work in all departments on an assignment and voluntary basis. All male doctors and male nurses working in these units who accepted participation and had regular sexual activity were included in the study. A control group was formed by filling IES-R and IIEF in 200 male patients who applied to the urology outpatient clinic with any complaints and had not had COVID-19 before. Participants with known comorbidities and regular drug use were excluded from the study.

This study was reviewed and approved by the medical ethics committee of Van Training and Research Hospital on 8 May 2020 (approval number: 2020/08). The researchers explained to the participants that the survey results would only be used for research purposes and that the information provided would be kept confidential. They also explained the purpose and importance of the research. Verbal informed consent was obtained from all survey participants before the survey was conducted. The participants could submit the questionnaire at any time within 10 days. The questionnaire was anonymous, and the confidentiality of the data was secured.

2.2 | Measures

A demographic information form including age, occupation, marital status and unit of work was given to the participants. Among the demographic data, the ages were categorised as 18–25 years, 26–30 years and >30 years; the professions were categorised as physician and nurse, and the units of work were classified as 'suspected patient area' and 'diagnosed patient area'. Ages were categorised in this way because there were no nurses over 40 years old in the study after exclusion of participants. Divorced and widowed participants were included in the single subgroup because they did not experience family unity and their numbers were not statistically sufficient. However, single subgroup (single, divorced and widowed) was formed with participants who have sexual partners.

The Turkish version of the Revised Event Impact Scale (IES-R; range 0–88, 22 questions), which evaluated PTSD, was given to the participants. For the validity and reliability, the Turkish version of IES-R was formed by Corapcioglu et al., (2006) For the IES-R, normal (0–8), mild (9–25), moderate (26–43) and severe (44–88) distress were interpreted, and the cut-off value was specified as 26. Patients with scores below 26 were considered not to have PTSD. The participants were given the Turkish versions of the International Index of Erectile Dysfunction (IIEF), which evaluated ED and had international validity. For the validity and reliability, the Turkish version of IIEF-5 was formed by Turunç et al., (2007) The cut-off value for ED was specified as 21. It was considered that there was no ED for scores above 21. The scores were interpreted as follows: severe (severe) ED (5–7), moderate (moderate) ED (8–11), mild–medium (mild to moderate) ED (12–16), mild (mild) ED (17–21) and no ED (22–25). These categories of the scales were specified according to the values determined in the literature (Horowitz et al., 1979; Rhoden et al., 2002).

2.3 | Statistical analysis

The normal distribution of continuous variables was evaluated by visual (histogram and probability plots) and analytical (Kolmogorov–Smirnov and Shapiro–Wilk tests) methods. In the descriptive findings, categorical variables are given as numbers (per cent), and continuous variables are presented with median (minimum-maximum) for normal nonscattering data. For the categorical variables,

TABLE 1 Demographic table

	Healthcare professionals (number, percentage)	Control group (number, percentage)	p
Total participants	159	200	
Age			
Age (median (min-max))	32 (20–55)	34 (19–55)	.703[*]
18–25	24 (15.1%)	39 (19.5%)	.449[**]
26–30	38 (23.9%)	40 (20%)	
>30	97 (61%)	121 (60.5%)	
Marital Status			
Single (divorced, widow) + Regular relationship	37 (23.3%)	56 (28%)	.310[**]
Married	122 (76.7%)	144 (72%)	
IIEF			
Median (min-max)	13 (5–24)	21 (7–25)	<.001[*]
No ED	28 (17.6%)	99 (49.5%)	<.001[**]
ED	131 (%82.4)	101 (50.5%)	
IES-R			
Median (min-max)	28 (0–75)	9 (0–46)	<.001[*]
No PTSD	72 (54.7%)	180 (%90)	<.001[**]
PTSD	87 (45.3%)	20 (%10)	
Occupation			
Physician	102 (64.2%)	N/A	N/A
Nurse	57 (35.8%)		
Unit			
Suspected patient area	61 (38.4%)	N/A	N/A
Quarantine-treatment units (diagnosed patient area)	63 (39.6%)		
COVID-19 intensive care unit (diagnosed patient area)	35 (22%)		

*Mann–Whitney U test.
**Pearson's chi-square test.

statistical difference among the groups was determined by using Pearson's chi-square and Fisher's exact tests. For the continuous variables, statistical difference among the groups was determined by using Mann–Whitney U and Kruskal–Wallis H tests. Correlations between continuous measures were determined using Spearman's (r_s) correlation. Univariate and multivariate logistic regression analyses were performed to determine the risk factors in predicting severe erectile dysfunction. Statistical significance was accepted as $p < .05$. R version 3.6.3 was used for statistical analysis of research data.

3 | RESULTS

3.1 | Demographic characteristics

A questionnaire was delivered to a total of 252 male HCP. The number of employees who answered the questionnaire was 175 (69.4%).

After 16 people who reported having comorbidity and using antihypertensive, antidiabetic, or antidepressant medication were excluded from the study, 159 questionnaires were included in the study; 102 physician employees (64.2%), and 57 nurses (35.8%) were included in the study. For the control group, 200 patients who were admitted to the urology outpatient clinic with any complaints and did not have any comorbidities and any continuous medication use were included.

The median age of the HCP was 32 (20–55) years. The median age of the control group was 34 (19–55) years. There was no significant difference between HCP and control group ($p = .703$). The median age was 35 (24–55) for physicians and 28 (20–38) for nurses. There was no significant difference between HCP and control group in terms of age distribution and marital status ($p = .449$, $p = .310$ respectively). (Table 1).

The distribution by unit of work was as follows: 61 participants worked in the suspected patient area (38.4%), 63 worked in the

TABLE 2 Scale intensity of the whole cohort and subgroups

	Total (number, percentage)	Occupation		Age			Marital status		Unit of work	
	159	Physician (n = 102)	Nurse (n = 57)	18–25 (n = 24)	26–30 (n = 38)	>30 (n = 97)>	Single (n = 37)	Married (n = 122)	Suspected patient area (n = 61)	Diagnosed patient area (n = 98)
Index of erectile function (IIEF-5)										
No ED (22–25)	28 (17.6%)	22 (21.6%)	6 (10.5%)	4 (16.7%)	8 (21.1%)	16 (16.5%)	8 (21.6%)	20 (16.4%)	14 (23%)	14 (14.3%)
Mild (17–21)	25 (15.7%)	19 (18.6%)	6 (10.5%)	4 (16.7%)	5 (13.2%)	16 (16.5%)	10 (27%)	15 (12.3%)	11 (18%)	14 (14.3%)
Mild to Moderate (12–16)	39 (24.5%)	30 (29.4%)	9 (15.8%)	5 (20.8%)	6 (15.8%)	28 (28.9%)	10 (27%)	29 (23.8%)	19 (31.1%)	20 (20.4%)
Moderate (8–11)	38 (23.9%)	19 (18.6%)	19 (33.3%)	4 (16.7%)	11 (28.9%)	23 (23.7%)	5 (13.5%)	33 (27%)	11 (18%)	27 (27.6%)
Severe (5–7)	29 (18.2%)	12 (11.8%)	17 (29.8)	7 (29.2%)	8 (21.1%)	14 (14.4%)	4 (10.8)	25 (20.5%)	6 (9.8%)	23 (23.5%)
p		**=.002***		.644**			=.087*		=.062*	
The impact of event scale-revised (IES-R)										
Normal (0–8)	38 (23.9%)	25 (24.5%)	13 (22.8%)	7 (29.2%)	10 (26.3%)	21 (21.6%)	10 (27%)	28 (23%)	14 (23%)	24 (24.5%)
Mild (9–25)	34 (21.4%)	18 (17.6%)	16 (28.1%)	5 (20.8%)	11 (28.9%)	18 (18.6%)	12 (32.4%)	22 (18%).	17 (27.9%)	17 (17.3%)
Moderate (26–43)	65 (40.9%)	46 (45.1%)	19 (33.3%)	8 (33.3%)	12 (31.6%)	45 (46.4%)	14 (37.8%)	51 (41.8%)	22 (36.1%)	43 (43.9%)
Severe (43–88)	22 (13.8%)	13 (12.7%)	9 (15.8%)	4 (16.7%)	5 (13.2%)	13 (13.4%)	1 (2.7%)	21 (17.2%)	8 (13.1%)	14 (14.3%)
p		=.336*		=.652**			=.061*		=.461*	

Bold statements show statistically significant difference.

*Pearson's chi-square test.

**Fisher's exact test.

TABLE 3 Scale Scores of the Whole Cohort and Subgroups

	Total Score, Median (IQR)	Occupation Median-IQR			Age Median-IQR				Marital Status Median-IQR			Unit of Work Median-IQR		
		Physician	Nurse	p	18–25	26–30	>30	p	Single	Married	p	Suspected Patient Area	Diagnosed Patient Area	p
Index of Erectile Function (IIEF-5)	13 (5–24)	15 (5–24)	10 (5–23)	<.001*	14 (5–23)	11.5 (5–23)	14 (5–24)	.715	16 (5–24)	12 (5–24)	**.014***	15 (6–24)	11 (5–24)	**.011***
The Impact of Event Scale-Revised (IES-R)	28 (0–75)	28 (1–75)	23 (0–74)	.711*	25 (0–74)	20.5 (1–72)	28 (1–75)	.648**	19 (1–74)	29 (0–75)	.081*	23 (1–74)	28 (0–75)	.698*

Bold statements show statistically significant difference.

*Mann–Whitney U test, Kruskal–Wallis H test.

quarantine-treatment units (39.6%), and 35 worked in the COVID-19 intensive care unit (22%). For physicians, this distribution was as follows: 37 physicians worked in the suspected patient area (36.3%), 40 worked in the quarantine-treatment units (39.2%), and 25 worked in the COVID-19 intensive care unit (24.5%). For nurses, the distribution by unit of work was as follows: 24 nurses worked in the suspected patient area (42.1%), 23 worked in the quarantine-treatment units (40.4%), and 10 worked in the COVID-19 intensive care unit (17.5%) (Table 1).

3.2 | Severity of measurement

Symptoms of ED were observed in 131 individuals (82.4%) among HCP and 101 individuals (50.5%) among control group. There was a statistically significant difference between the two groups in percentage of ED symptoms ($p < .001$).

Symptoms of ED were observed in 80 (78.4%) of the physicians and in 51 (89.5%) of the nurses. There was a statistically significant difference between the two groups in terms of ED symptoms severity ($p = .002$) (Tables 2-4)

The distribution of ED symptoms of HCP by marital status was as follows: ED symptoms were observed in 29 single participants (78.4%) and in 102 married participants (83.6%). There was no significant difference between the two groups in terms of ED symptoms severity (Table 2).

Symptoms of ED were found in 47 (77%) of the HCP who worked in the suspected patient area and in 84 (85.7%) of the HCP who worked in the diagnosed patient area. There was no significant difference between the two groups in terms of ED symptoms severity (Table 2).

3.3 | Scores of measurement

The median value of IIEF-5 of the HCP and control group ED was 13 (5–24) and 21 (7–25) respectively. The median values for HCP were statistically significantly lower ($p < .001$).

The median value of IIEF-5 was 15 (5–24) for the physicians and 10 (5–23) for the nurses. The median values for the nurses were statistically significantly lower ($p < .001$).

The median IIEF-5 value in HCP group was 16 (5–24) for single participants (divorced, widowed) and 12 (5–24) for married participants. The median values for the married participants were statistically significantly lower ($p = .014$).

The median IIEF-5 values by unit of work were as follows: 15 (6–24) for the participants who worked in the suspected patient area and 11 (5–24) for the participants who worked in the diagnosed patient area. Here, the median values for the participants working in the diagnosed patient area were statistically significantly lower ($p = .011$).

A moderately strong inverse correlation was found between the IIEF-5 and IES-R scores ($r_s = -0.677$, $p < .001$). (Symptom severity

TABLE 4 Regression analysis

Model predicting severe ED		Univariate			Multivariate[**]		
		OR	CI 95%	p^*	OR	CI 95%	p^*
Occupation	Physician	Ref.	1.39–7.29	0.006	Ref		**0.002**
	Nurse	3.18			3.89	1.62–9.33	
Age	1	Ref.		0.226			
	2	0.64	0.20–2.09				
	3	0.41	0.14–1.16				
Marital status	Single	Ref		0.190	Ref		0.108
	Married	2.12	0.68–6.56		2.64	0.80–8.67	
Working Area	Suspected Patient Area	Ref		0.036	Ref		
	Diagnosed Patient Area	2.81	1.07–7.36		3.42	1.24–9.41	**0.017**

Bold statements show statistically significant difference.

*Wald test.

**$p > .2$ factors were included in the multivariate model in univariate analysis.

increased as the IIEF-5 score decreased and symptom severity increased as the IES-R score increased.)

3.4 | Risk factors

According to the multivariate logistic regression analysis, being a nurse was a risk factor for severe ED (OR 3.89, 95% CI, 1.62–9.33, $p = .002$). Working in the diagnosed patient area was a risk factor for severe ED (OR 1.24, 95% CI, 1.24–9.41, $p = .017$).

4 | DISCUSSION

In this study, ED status related to PTSD was examined in HCP who were assigned according to the epidemic work plan after the first case report of COVID-19 on 15 March 2020 in Van, Turkey. A descriptive study was designed on the extent and severity of ED symptoms associated with PTSD after this epidemic, which has become a pandemic, showed rapid transmission and involved mortality risks for both patients and employees. To our knowledge, this may be the first study to examine the prevalence and severity of ED in HCP involved in the COVID-19 epidemic.

Symptoms of PTSD and ED were observed at a high rate in all HCP participating in this study. In previous studies conducted during SARS and COVID-19 epidemics, high rates of PTSD symptoms and high severity of symptoms indicated that all HCP perceived this situation as a natural disaster or state of war and reacted accordingly (Chua et al., 2004; Lai et al., 2020; Tang et al., 2017; Wu et al., 2009). The high rate of these symptoms among HCP was explained by factors such as anxiety related to their own health and that of their families, isolation from the social environment, uncertainty about the epidemic and lack of protective equipment (Chan-Yeung, 2004; Wong et al., 2005).

The prevalence and severity of PTSD-related ED have been mostly assessed by studies on war veterans. In these studies, sexual dysfunction was shown to be more frequent and more severe in veterans with PTSD symptoms (Antičević & Britvić, 2008; Hosain et al., 2013; Kotler et al., 2000; Letica-Crepulja et al., 2019). In studies conducted by Crepulja et al. and Anticevic et al., it was stated that avoidance, numbing and increased arousal, among PTSD symptoms, were particularly associated with sexual function problems (Antičević & Britvić, 2008; Letica-Crepulja et al., 2019) The high level of anxiety, anger and irritability observed in these patients not only creates sexual dysfunction independently but also affects sexual dysfunction indirectly due to negative effects on social or romantic relationships and intimacy with the opposite sex (Gruden & Gruden Jr, 2000; Hosain et al., 2013; Kaplan, 1989) Moreover, the researchers reported that anger and anxiety might have a bidirectional relationship with erectile function. That is, anger and anxiety can create ED, and ED can induce or increase these symptoms (Kotler et al., 2000) The relationship between ED and psychological state has also been examined in large-scale studies. In the National Health and Social Life Survey (NHSLS) study, which examined sexual dysfunction in 1,410 men aged between 18 and 59 years, sexual dysfunction was evaluated in different categories such as sexual desire, erection and ejaculation problems, and performance anxiety. NHSLS data show that emotional problems and stress-related problems pose a risk of difficulty being experienced at all stages of sexuality. The researchers concluded that psychological state was an independent factor affecting sexual function (Laumann et al., 1999). In a study conducted by Moreira et al., a significant relationship was found between depression and ED, regardless of age and other risk factors (Moreira Jr et al., 2001). In 'The multinational men's attitudes to life events and sexuality' (MALES) study conducted in Europe and North and South America, which included 2,912 men, depression or anxiety was found in 25% of the patients who reported to have ED, while ED

was found in 26% of the patients who reported to have depression or anxiety (Rosen et al., 2004). The correlation of ED severity with PTSD severity in our study also supported this information. It should be kept in mind that the pandemic may also cause PTSD-related sexual dysfunction in people who do not work in the health sector. However, it is obvious that HSP who are at the forefront of the struggle with the pandemic will be more affected by this situation.

In a study conducted by Tang et al., which evaluated anxiety levels in nurses after the H7N9 epidemic, it was stated that anxiety levels were higher at younger ages, and this was related to knowledge, skill and professional experience (Tang et al., 2017). It is known that ED is correlated with age. Low sexual interest and erection problems are age-related disorders caused by physiological changes associated with ageing. Many studies on sexual dysfunction have shown that age is an independent ED predictor, although different rates have been found in different studies (Ahn et al., 2007; Fugl-Meyer et al., 1999; Richters et al., 2003). In our study, we believe that the absence of a significant difference between the age groups in terms of ED arose from the fact that the nurses, whose mean age was lower than that of the physicians, had higher PTSD and ED symptom scores.

The finding that ED was observed at a higher rate and with higher severity in the nurses in our study may be associated with several factors relating to the nature of their profession. These include more frequent contact with patients during the day and not being informed about epidemics and their outcomes as much as physicians due to difference in their training (Chua et al., 2004; Lai et al., 2020; Tang et al., 2017). In other studies related to epidemics, it was also observed that nurses tended to develop anxiety due to these factors (Chan-Yeung, 2004; Shih et al., 2007). Although the mean age of the nurses was lower than that of the physicians, the higher incidence of ED in nurses indicated the importance of the effect of PTSD on ED in HCP. As shown in other studies, nurses need more education and psychological support in relation to epidemics.

In the NHSLS study, sexual dysfunction symptoms were less common in married men, and it was stated that the probable reason for this might be sexual lifestyle differences (Laumann et al., 1999). In the study conducted by Moreira et al., no significant relationship was found between ED and marital status (Moreira Jr et al., 2001). In our study, ED rates were higher in married HCP. We believe this was related to the mean age of the married patient group being high and the anxiety they experienced in relation to their families being greater. It was stated that married HCP were more concerned about their own health and that of their families, especially their children, in some studies conducted after the SARS epidemic, and it was therefore concluded that married people showed more PTSD symptoms (Wu et al., 2009).

The staff working in the diagnosed patient area have more contact with the patients due to follow-up and treatment of the patients, and all the patients in this section have a definite diagnosis. Therefore, the employees working here have a greater risk of being infected. Indeed, the high rate of ED symptoms in HCP in this group is consistent with the significantly higher rate of PTSD symptoms found in HCP working on the front line in other studies relating to SARS and COVID-19 epidemics (Lai et al., 2020; Liu et al., 2020; Shih et al., 2007).

Our study had some limitations. The fact that all physicians in our hospital served in units established for the COVID-19 outbreak prevented us from establishing the control group of HCP. Additionally, lack of questioning on histories of smoking, physical activity, socioeconomic status, psychiatric illness and sexual trauma, which influence sexual function, meant that limited information was obtained on the causality of ED. The absence of those aged over 40 among nurses caused us to evaluate all employees aged over 30 years in the same group. Therefore, the information we obtained about age groups may be insufficient. Only erectile dysfunction was examined in our study. Other aspects of sexual dysfunction such as desire and orgasmic function were not investigated. Long-term follow-up could not be performed in HCP, and evaluation was made only 10 days after the tests were conducted. The employee group we evaluated comprised only staff working in our hospital, which constituted a limited sample. Conducting such studies with larger samples and a multicenter design may provide more useful findings.

5 | CONCLUSION

HCP working during epidemics are psychologically affected due to their heavy workload and concerns regarding themselves and their families. Experience of this trauma causes symptoms of different severity related to sexual dysfunction in HCP. We believe that the results of our study are important with respect to psychological support for HCP working in epidemics, measures taken against potential sexual dysfunction, and determining which groups require more support. However, it should be considered that multicenter studies enrolling larger numbers of participants will be more useful.

CONFLICT OF INTEREST
The authors certify that they have no conflict of interest with any financial organisation regarding the material discussed in the manuscript.

AUTHORS' CONTRIBUTION
All authors read and approved the final version of the manuscript. Ender Cem Bulut, Kasım Ertaş, Dilek Bulut: Study Design. Murat Yavuz Koparal, Serhat Çetin: Statistical Analysis. Ender Cem Bulut, Murat Yavuz Koparal: Data Interpretation. Ender Cem Bulut, Kasım Ertaş, Dilek Bulut: Manuscript Preparation. Ender Cem Bulut, Serhat Çetin: Literature Search.

DATA AVAILABILITY STATEMENT
The data that support the findings of this study are available from the corresponding author upon reasonable request.

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