

## Research Article

# The Influence of Smartphone Screen Time on Acquired Premature Ejaculation: A Prospective Preliminary Study

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This prospective study is aimed at investigating the relationship between smartphone screen time and the intravaginal ejaculation latency time (IELT) in patients with acquired PE and to contribute to the literature. Thirty patients who had been diagnosed with acquired PE in our clinic between March 2022 and May 2022 were included in the study. Carrying similar demographic characteristics to the patient group, a total of 30 healthy volunteers were included as the control group. Patients who were using Huawei or iPhone brand of smartphones and who had data of at least one week of screen time were included in the study. The data were collected from the applications on the phones. PE was evaluated using PEDT, the Turkish validation of which had been carried out. The patients and the controls also underwent the application of the Quality-of-Life Questionnaire-Short Form (SF-36), which has also been validated for Turkish. The patients and the controls were compared with regard to smartphone screen time, IELT, PEDT scores, and the SF-36 scores. The mean screen time was found to be statistically significantly higher in the PE group compared to that of controls ( $336 \pm 137$  min/day,  $246 \pm 76.4$  min/day, respectively,  $p = 0.045$ ). In the correlation analysis between the IELT and the PEDT scores of the patients, a significant negative correlation was found between the screen time and the IELT, and a significant positive correlation was found between the screen time and the mean PEDT scores ( $p < 0.001$ ,  $p < 0.001$ , respectively). Our results showed that smartphone screen time negatively affected the IELT values and PE severity in patients with acquired PE.

## 1. Introduction

Premature ejaculation (PE), which is an important problem among men, is seen in 4-39% of the general population and described as the inability to control or delay ejaculation that causes dissatisfaction or distress in the patient and/or partner [1-3]. PE (lifelong or acquired), which has many definitions, is defined by The International Society for Sexual Medicine (ISSM) as the occurrence of ejaculation without vaginal penetration or less than 1 minute after vaginal

penetration. It is classified by Serefoglu et al. [4] in three clinical features: (a) ejaculation is almost always before or after vaginal penetration lasting less than 1 minute (lifelong PE), or clinically significant and disturbing reduction in ejaculation time, usually less than 3 minutes (acquired PE); (b) inability to delay ejaculation on all or nearly all vaginal penetrations; and (c) negative personal consequences, such as distress, frustration, and/or the avoidance of sexual intimacy [4]. The complex interaction between serotonergic, dopaminergic, oxytocinergic, and endocrinological pathways

in the central and peripheral nervous systems and the genetic and epigenetic factors has been proposed to mediate the pathophysiology of lifelong PE [5]. Acquired PE is associated with etiological factors such as erectile dysfunction (ED), prostatitis, hyperthyroidism, drug withdrawal/detoxification, or recreational drug use, as well as psychological problems such as sexual performance anxiety, problems between couples, and psychiatric pathologies [6].

Screen time continues to be a gradually increasing problem among adults with health behaviors and health outcomes [7]. Long-term smartphone use has been associated with many negative health problems, such as obesity, type 2 diabetes, cardiovascular disease, and premature death in adults, as well as psychological illnesses such as depression and anxiety [8].

There is a limited number of studies in the literature evaluating the effect of increased smartphone screen time on male sexual health [9–11]. According to our literature review, there is no study in the literature investigating the smartphone screen time on premature ejaculation. In this prospective pilot study, we aimed to investigate the relationship between smart screen times and acquired PE.

## 2. Material and Methods

**2.1. Study Design.** The ethics committee approval was obtained from Erzurum Regional Research and Training Hospital Clinical Research Ethics Committee prior to the study (date: February 07, 2022; number: 2022/02-08). Consent was obtained from the individuals participating in the study before the study. Thirty patients who had been diagnosed with acquired PE at the Urology Outpatient Clinic of Health Sciences University Erzurum Regional Research and Training Hospital between March 2022 and May 2022 were included in the study. A total of 30 healthy volunteers with similar demographic characteristics to the patient group were included as the control group. Age, body mass index (BMI), educational status, IELT, results of the premature ejaculation diagnostic tool (PEDT), and the data regarding smartphone screen time were recorded for both the patients and the controls. IELT was measured by patients using a stopwatch. Patients whose IELT was shorter than 3 min, those who could not delay ejaculation in all or nearly all vaginal penetrations, and those who had negative consequences such as distress, disappointment, and/or avoidance of sexual intimacy were diagnosed with acquired PE. Patients who had been going out with a female partner for at least one year and who had PE for at least 6 months were included in the study.

### 2.2. Study Groups

**2.2.1. Inclusion and Exclusion Criteria.** The study's control group consisted of healthy individuals who did not have a history of premature ejaculation or complaints, had a PEDT score of 11 or higher, an IELT time of more than 3 minutes with a chronometry, a smartphone such as an iPhone or a Huawei that could record screen time, and volunteered to participate in the study. We formed the patient group in

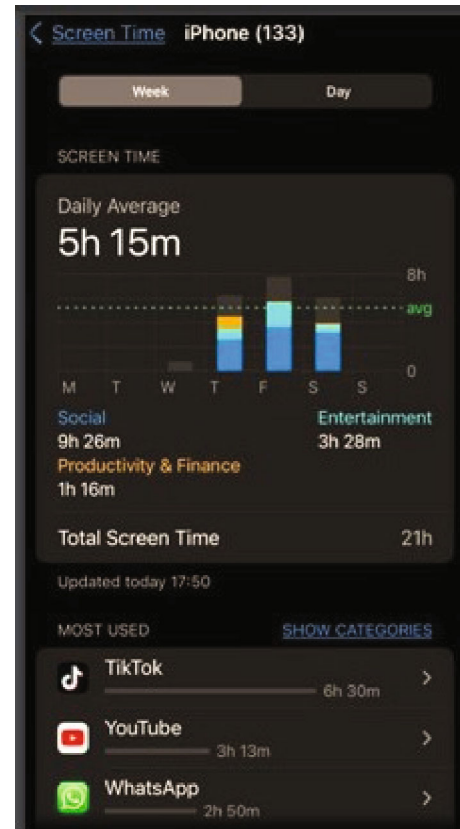


FIGURE 1: View of screen time on iPhone.

the study from patients who applied to our outpatient clinic with the complaint of premature ejaculation with a PEDT score below 8 in accordance with the International Society for Sexual Medicine (ISSM) criteria, had an IELT of 3 minutes or less, and were unable to delay ejaculation at all or nearly all vaginal penetrations, resulting in negative consequences such as anxiety, discomfort, frustration, and/or avoidance of sexual intimacy.

Individuals under the age of 18, patients who do not have regular sexual intercourse, patients who had been diagnosed with lifelong, subjective, and variable PE, those who had endocrinopathies like DM and hyperthyroidism, those who had psychiatric or somatic disorders, those who had a history of drug use that influences sexual function, those who did not have a smartphone model that could measure screen time during the last one week, and those who had been diagnosed prostatitis were excluded from the study.

**2.2.2. Selection of Smartphone and Screen Time.** Patients who were using Huawei or iPhone brand of smartphones and who had data of at least one week of screen time were included in the study. These devices were selected as they recorded the total weekly screen time that could yield information about the typical usage. The data were collected from the applications on the phones. Furthermore, as these devices categorized the weekly screen time as social media (WhatsApp, Facebook, Clubhouse, Instagram, etc.), entertainment (YouTube, Shazam, and Netflix), and programs (Chrome, Safari, etc.), these categorized times were recorded

TABLE 1: Demographic data and characteristics of various parameters.

The number of participants	60
Mean age $\pm$ SD, years	32.7 $\pm$ 7.25
Mean BMI $\pm$ SD, kg/m <sup>2</sup>	22.5 $\pm$ 2.53
Education status, <i>n</i> (%)	
Primary education	17 (28.3)
Lower secondary education	18 (30.0)
Upper secondary education	18 (30.0)
Postsecondary nontertiary education	7 (11.7)
Mean media social time $\pm$ SD (min)	154 $\pm$ 108
Mean media entertainment time $\pm$ SD (min)	66.2 $\pm$ 38.5
Mean media utilities time $\pm$ SD (min)	43.7 $\pm$ 32.1
Mean shopping and food time $\pm$ SD (min)	18.4 $\pm$ 12.1
Mean other activity time $\pm$ SD (min)	8.51 $\pm$ 5.87
Mean screen time $\pm$ SD (min)	291 $\pm$ 129
Categorization according to screen time per day, <i>n</i> (%)	
$\leq$ 240 min	24 (40.0)
240-360 min	22 (36.7)
$\geq$ 360 min	14 (23.3)
Mean IELT $\pm$ SD (sec)	169 $\pm$ 96.0
Mean PEDT score $\pm$ SD	10.3 $\pm$ 5.27
Mean score (role functioning/emotional) $\pm$ SD	86.9 $\pm$ 16.6
Mean score (social functioning) $\pm$ SD	90.5 $\pm$ 8.64
Mean score (physical functioning) $\pm$ SD	93.2 $\pm$ 7.85
Mean score (role functioning/physical) $\pm$ SD	90.8 $\pm$ 12.1
Mean score (pain) $\pm$ SD	97.5 $\pm$ 4.36
Mean score (general health) $\pm$ SD	84.0 $\pm$ 14.4
Mean score (energy/fatigue) $\pm$ SD	62.6 $\pm$ 14.8
Mean score (emotional well – being) $\pm$ SD	71.5 $\pm$ 16.3

SD: standard deviation; BMI: body mass index; IELT: intravaginal ejaculation latency time; PEDT: premature ejaculation diagnostic tool.

separately as weekly total and mean daily times (min). The participants were instructed on how they could reach these data by the researcher by using documents and photos (Figure 1).

**2.2.3. Questionnaire Selection.** PE was evaluated using PEDT, the Turkish validation of which had been carried out. PEDT is a questionnaire that evaluates PE through 5 questions about control, frequency, minimum erotization, distress, and interpersonal difficulties, and the answers are scored between 0 (never difficult) and 4 (extremely difficult). While 11 points or above indicate PE, 9 or 10 points indicate possible PE, and 8 points or below indicate low possibility of PE [12]. The patients and the control also underwent the application of the Quality-of-Life Questionnaire-Short Form (SF-36), which has also been validated for Turkish. This is a multicultural questionnaire of 36 questions, which is classified according to 8 fields of score profile including physical functioning, overall health, physical role (role limitations due to physical health problems), bodily pain, social functioning, vitality,

emotional role (role limitations due to physical emotional problems), and mental health [13]. Each field is scored between 0 and 100, and higher scores indicate better health.

The patients and the controls were compared with regard to smartphone screen time, IELT, PEDT scores, and SF-36 scores. Furthermore, patients with acquired PE were divided into 3 groups as 240 min or less, 240-360 min, and more than 360 min according to the mean daily screen times, and the relationship between the groups regarding IELT and PEDT scores was statistically analyzed.

**2.3. Statistical Analysis.** The categorical variables were expressed as numbers and percentages, and the continuous variables were expressed as mean and standard deviation. The normality distribution of the continuous variables was evaluated with the Shapiro-Wilk test. The mean values of the normally distributed two independent groups were compared using Student's *t*-test, and the mean values of the nonnormally distributed two independent groups were compared using the Mann-Whitney *U* test. The mean values of more than two

TABLE 2: Comparison of patients diagnosed with acquired premature ejaculation and control group.

Variables	Patient	Control	<i>p</i> value
The number of participants, <i>n</i> (%)	30 (50)	30 (50)	
Mean age ± SD, years	33.8 ± 8.36	31.6 ± 5.89	0.251*
Median (range)	32.5 (22-55)	31.5 (22-44)	
Mean BMI ± SD, kg/m <sup>2</sup>	22.5 ± 2.52	22.6 ± 2.59	0.960*
Median (range)	23 (18-28)	23 (18-28)	
Education status, <i>n</i> (%)			
Primary education	7 (23.3)	10 (33.3)	
Lower secondary education	11 (36.7)	7 (23.3)	0.633+
Upper secondary education	8 (26.7)	10 (33.3)	
Postsecondary nontertiary education	4 (13.3)	3 (10.0)	
Mean media social time ± SD (min)	197 ± 132	111 ± 50.8	0.031**
Median (range)	151 (55-456)	104.5 (18-232)	
Mean media entertainment time ± SD (min)	68.2 ± 40.7	64.3 ± 36.7	0.696*
Median (range)	65 (10-125)	65 (10-135)	
Mean media utility time ± SD (min)	44.8 ± 36.8	42.7 ± 27.3	0.496**
Median (range)	26 (12-126)	33 (12-116)	
Mean shopping and food time ± SD (min)	17.1 ± 12.9	19.7 ± 11.3	0.399*
Median (range)	12 (2-55)	20.5 (2-45)	
Mean other activity time ± SD (min)	8.76 ± 0.58	8.26 ± 6.73	0.745*
Median (range)	10 (3-22)	5 (2-28)	
Mean screen time ± SD (min)	336 ± 137	246 ± 76.4	0.045**
Median (range)	285 (125-609)	252 (130-411)	
Categorization according to screen time per day, <i>n</i> (%)			<0.001+
≤240 min	10 (33.3)	14 (46.7)	1 vs. 2<0.489
240-360 min	7 (23.3)	15 (50.0)	1 vs. 3<0.002
≥360 min	13 (43.3)	1 (3.3)	2 vs. 3 < 0.001
Mean IELT ± SD (sec)	87.5 ± 0.01	251 ± 42.5	<0.001**
Median (range)	81.5 (10-172)	245 (190-358)	
Mean PEDT score ± SD	15.0 ± 2.89	5.56 ± 1.38	<0.001**
Median (range)	15 (12-20)	6 (3-7)	
Mean score (role functioning/emotional) ± SD	81.8 ± 17.2	92.0 ± 14.6	0.018**
Median (range)	66 (66-100)	100 (66-100)	
Mean score (social functioning) ± SD	87.1 ± 8.97	94.0 ± 6.87	0.002*
Median (range)	90 (60-100)	95 (80-100)	
Mean score (physical functioning) ± SD	92.6 ± 8.38	93.8 ± 7.39	0.570*
Median (range)	95 (70-100)	95 (80-100)	
Mean score (role functioning/physical) ± SD	90.8 ± 12.2	90.8 ± 12.2	1.000*
Median (range)	100 (75-100)	100 (75-100)	
Mean score (pain) ± SD	98.0 ± 4.06	97.0 ± 4.66	0.380*
Median (range)	100 (90-100)	100 (90-100)	
Mean score (general health) ± SD	82.1 ± 15.5	86.0 ± 13.2	0.308*
Median (range)	85 (60-100)	90 (60-100)	
Mean score (energy/fatigue) ± SD	58.6 ± 14.0	66.6 ± 14.7	0.031**
Median (range)	50 (30-100)	60 (50-100)	
Mean score (emotional well – being) ± SD	65.5 ± 15.5	77.6 ± 15.0	0.004**
Median (range)	60 (50-100)	80 (50-100)	

SD: standard deviation; BMI: body mass index; IELT: intravaginal ejaculation latency time; PEDT: premature ejaculation diagnostic tool. \*Independent sample *t*-test. \*\*Mann–Whitney *U* test. +Fisher's exact test.

TABLE 3: The association of average screen time per day with IELT and PEDT score.

Spearman's rho*		IELT	PEDT
Screen time	CC	-0.844	0.878
	Sig. (2-tailed)	<0.001*	<0.001*

IELT: intravaginal ejaculation latency time; PEDT: premature ejaculation diagnostic tool. \*Pearson's correlation.

groups were compared using the variance analysis (ANOVA) in the normally distributed groups and using the Kruskal-Wallis test in the nonnormally distributed groups. In comparisons made using ANOVA, posthoc analysis was performed using the Bonferroni test when there was a significance and using the Tamhane T2 test when the Kruskal-Wallis test showed a significance. A *p* value of lower than 0.05 was considered statistically significant. Power analysis was performed according to the "smartphone screen time" variable. According to the power analysis with preliminary data of the study (group 1: 263.4 ± 86.76, *n*:10; group 2: 341.2 ± 123.89, *n*:10), the effect size was 0.68 with 0.80 power and 0.05  $\alpha$ -error, and the sample of 27 patients was found to be sufficient for performing the statistical analysis in each group. Considering the patients who would be excluded from the study, 30 patients were included in the study for each group.

### 3. Results

Thirty patients diagnosed with acquired PE and 30 healthy volunteers were included in the study. The mean age of the participants was 32.7 ± 7.25 years, and the mean BMI was 22.5 ± 2.53 kg/m<sup>2</sup>. The demographic characteristics, the mean daily screen time, the IELT and PEDT scores, and the SF-36 scores of the participants have been presented in Table 1.

The mean screen time was found to be statistically significantly higher in the PE group compared to controls (336 ± 137 min/day, 246 ± 76.4 min/day, respectively, *p* = 0.045). The mean IELT was found to be statistically significantly shorter in the PE group compared to controls (87.5 ± 0.01 sec, 251 ± 42.5 sec, *p* < 0.001) (Table 2). The comparative IELT and the mean SF-36 scores of the patients and the controls have been summarized in Table 2.

In the correlation analysis between the IELT and PEDT scores of the patients, a significant negative correlation was found between the screen time and the IELT, and a significant positive correlation was found between screen time and the mean PEDT scores (*p* < 0.001, *p* < 0.001, respectively) (Table 3) (Figures 2 and 3).

The screen times of the patients with acquired PE were divided into 3 groups as less than 240 min, between 240 and 360 min, and more than 360 min. The mean IELT values were determined to be statistically significantly different between these groups (137 ± 38.7 sec, 115 ± 34.6 sec, 34.5 ± 15.3 sec, respectively, *p* < 0.001). Besides, the PEDT score was found to be significantly higher in patients with a mean screen time of 360 min compared to those with a screen time of 240 min (17.6 ± 1.38, 12.3 ± 0.94, *p* < 0.001) (Table 4).

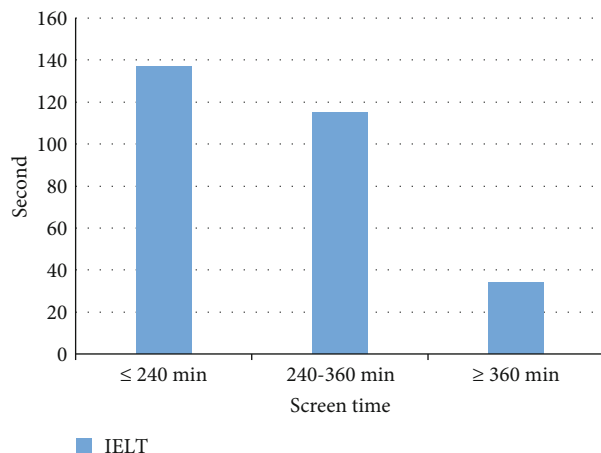


FIGURE 2: The relationship between smartphone screen times and IELT times in patients with acquired PE.

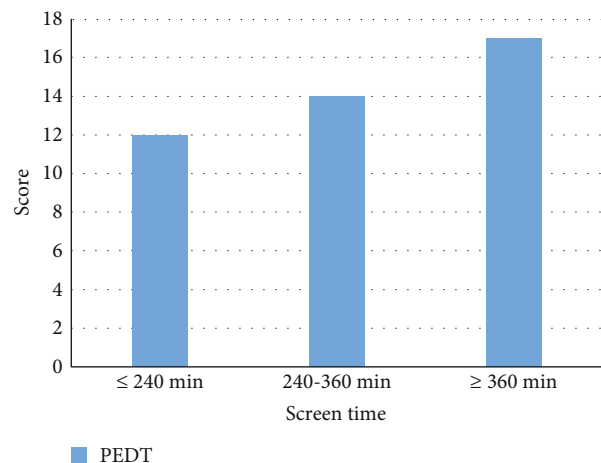


FIGURE 3: The relationship between smartphone screen time and PEDT scores in patients with acquired PE.

### 4. Discussion

PE is the most common male sexual dysfunction, the pathophysiology of which has not been clearly elucidated, significantly affecting the quality of life in men and their partners. ISSM classified premature ejaculation as lifelong or acquired and proposed inclusion of an objective, quantifiable time to ejaculation which is referred to as the IELT [4].

Acquired PE is the premature ejaculation in a male who has had a normal ejaculation experience during some time of his life [14]. Although organic or psychological factors including erectile dysfunction, prostatitis, hyperthyroidism, drawback/detoxification of various drugs, psychiatric and partnership problems, or sexual performance anxiety have been contributed to as the etiopathogenesis, it is still not clear [14].

The influence of smartphone use is a complex situation beyond the sedentary lifestyle due to sitting for a long time. The long-standing smartphone use has been associated with

TABLE 4: Comparison of IELT and PEDT scores of patients diagnosed with acquired premature ejaculation according to average screen time per day categorization.

Variables	≤ 240 (min)	Screen time 240-360 (min)	≥ 360 (min)	<i>p</i> value
Number of patients	10	7	13	
Mean IELT ± SD (sec)	137 ± 38.7	115 ± 34.6	34.5 ± 15.3	<0.001* 1 vs. 2<0.576 1 vs. 3<0.001 2 vs. 3<0.002
Mean PEDT score ± SD	12.3 ± 0.94	14.1 ± 2.73	17.6 ± 1.38	<0.001* 1 vs. 2<0.342 1 vs. 3<0.001 2 vs. 3<0.042

SD, standard deviation; IELT, intravaginal ejaculation latency time; PEDT, premature ejaculation diagnostic tool. \*One way ANOVA. \*Kruskal-Wallis test.

many negative health outcomes including interaction with electronic devices that provide contents through screen-based images, obesity, type 2 DM, cardiovascular disorders, premature death in adults, and depression [8]. Besides the psychological negative effects, smartphone use has been proven to be effective on male reproductive health through several studies [9, 11, 15]. Agarwal et al. reported that radio-frequency electromagnetic waves (EMW) radiating from smartphones could lead to oxidative stress in human sperm, and that sperms could be affected negatively [9]. The experimental study of Aitken et al. showed that EMW could have harmful effects on male reproducibility, both through thermal and nonthermal effects [15]. In the study of Fejes et al. who evaluated 371 males according to daily screen time of smartphones, a negative correlation was demonstrated with rapidly moving mobile sperm rate, and a positive correlation was reported with slowly moving mobile sperm rate [11]. Davoudi and Brossner demonstrated that smartphone use for longer than 6 hours reduced the mobility of spermatozoa [16]. The study of Gutschi et al. which evaluated 2119 males who had been admitted to the infertility clinic between 1993 and 2007 found higher testosterone (T) and lower luteinizing hormone (LH) levels in patients who were using smartphones compared to those who were not, and the authors proposed that EMW could have led to Leydig cell hyperplasia and higher T levels [17]. Al-Ali et al. reported in their pilot study investigating the effect of smartphone use on ED that males with ED were using their smartphones longer than those without ED [10].

In the present study, we determined that the screen time was longer in the PE group compared to the controls. The difference between screen times in patients and controls resulted from the time spent for social media. We also determined that role functioning/emotional, social functioning, energy/fatigue, and the emotional well-being scores of SF-36 were lower in PE patients compared to controls. We divided the screen times into 3 groups as less than 240 min, between 240 and 360 min, and more than 360 min. We determined that the IELT values were significantly shorter in the group with longer than 360 min screen time compared to other groups. Furthermore, the PEDT scores of the patients with longer than 360 min screen time were significantly lower compared to the group with less

than 240 min. In the correlation analysis, we determined that the IELT values significantly shortened, and the PEDT score significantly decreased as the screen time increased.

The results of our study support the studies in the literature that show the negative effects of increased screen times on the male reproductive system. Given the studies in the literature investigating psychosocial problems such as increased stress and anxiety, decreased physical activity, and increased testosterone, these negative outcomes from increased screen time suggest a possible relationship between acquired PE and the screen time. We suggest that the results of our study could be more interesting and alarming considering that screen times significantly increased during the COVID-19 pandemic, and this habit has further continued thereafter [18].

The limitations of our study include the small number of participants, the selection of only patients using iPhone and Huawei smartphones among the patients with acquired PE, not evaluating the quality of sexual life including the partners of the participants, and not making a causal inference between the screen time and PE due to the cross-sectional design of the study. Despite these limitations, the study also has strengths including being the first study in the literature determining the screen time through a more objective way, the applications in the smartphones and not through self-reporting of the participants.

## 5. Conclusion

The present study, which is the first in the literature focusing on the relationship between smartphone screen time and PE, indicates a relationship between the smartphone screen time and the IELT values and PEDT scores. In order to provide an answer to the question whether increased screen time increases the severity of PE or screen time increases as the severity of PE increases, larger longitudinal studies are required that could reveal the causation between acquired PE and the smartphone screen time.

## Data Availability

The (SPSS) data used to support the findings of this study are available from the corresponding author upon request.

## Ethical Approval

The study was performed in accordance with the most recent version of the Declaration of Helsinki.

## Conflicts of Interest

The authors declare there are no conflicts of interest-financial or otherwise-related to the material presented herein.

## Authors' Contributions

Ahmet Emre Cinislioglu contributed to the research design, approval of the submitted manuscript, and research acquisition. Saban Oguz Demirdogen contributed to the research design and interpretation of data. Adem Utlü contributed to the research design. Tugay Aksakalli contributed to the research design and interpretation of data. Mehmet Sefa Altay contributed to the research acquisition. Fatih Akkas contributed to the interpretation of data. Ibrahim Karabulut contributed to the research design and interpretation of data. Isa Ozbey contributed to revising critically the manuscript.

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