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Research

The Effect of Waiting Time on the Surgical Stretcher in the Operating Room for Urological Surgery on Anxiety and Surgical Fear: A Comparative Cross-sectional Study

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A B S T R A C T

Purpose: This study was conducted to examine the effect of operating room waiting time on surgical fear and preoperative anxiety in patients undergoing urinary system surgery.
Design: This study was conducted as a comparative cross-sectional.
Methods: This study was conducted with 150 patients undergoing urinary system surgery at a state hospital in Turkey between December 2023 and July 2024. Data were collected using a Descriptive Characteristics Form, the Visual Analog Scale, and the Surgical Fear Questionnaire at two time points: before entering the operating room (T0) and before being placed on the surgical table (T1). Patients were divided into 2 groups based on waiting time: group A (< 30 minutes) and group B (≥30 minutes). Statistical analysis was performed with SPSS 27.0 at a significance level of *P* less than .05.
Findings: Patients in groups A and B were similar in terms of descriptive characteristics and T0 assessment. However, at T1 assessment, patients in group B had significantly higher levels of anxiety ($P = .002$), short-term fear ($P = .001$), and total fear ($P = .001$) compared to group A. Waiting time had a significant effect on anxiety ($\beta = 0.637$, $P = .001$), short-term fear ($\beta = 0.788$, $P = .001$), and total fear ($\beta = 0.536$, $P = .001$).
Conclusions: Prolonged waiting time in the operating room significantly increases psychological burden by significantly increasing anxiety, short-term fear, and total fear levels in patients.

Preoperative anxiety is a significant psychological problem experienced by patients during the preoperative period and is often associated with fears related to anesthesia, surgical outcomes, and potential complications.[1-3] Urological procedures, particularly urinary system surgeries, can induce pronounced anxiety in patients due to the disruption of bodily integrity and stress caused by potential postoperative complications.[1] The operating room (OR) environment presents an unfamiliar and stressful setting for patients, and prolonged waiting times before surgery have been shown to increase anxiety levels.[1,2] In patients undergoing urinary system surgery, environmental factors such as waiting time, as well as individual factors such as gender, previous surgical experiences, and the complexity of the procedure, are significant determinants of anxiety levels.[4,5] Elevated anxiety levels are known to have adverse effects on physiological responses, such as increased heart rate and blood pressure, and can delay postoperative recovery.[6] Despite this, studies addressing the impact of OR waiting times on preoperative anxiety levels in patients undergoing urinary system surgery remain limited.

Preoperative anxiety is a significant issue arising from patients' concerns about anesthesia, surgical outcomes, and the recovery process.[7,8] This condition can negatively impact physiological parameters such as heart rate and blood pressure, complicating surgical outcomes.[7] Among the many factors influencing preoperative anxiety, waiting time holds critical importance. Studies have demonstrated that prolonged waiting times increase anxiety levels, particularly in elective surgery patients.[8] The OR waiting environment also directly affects patients' psychological states. Optimizing waiting areas, such as providing dedicated waiting rooms for pediatric patients, has been shown to reduce anxiety and accelerate postoperative recovery.[9] Similarly, nonpharmacological interventions, such as music therapy and video entertainment, have proven

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effective in reducing preoperative anxiety in both adult and pediatric patients.[10] Gender, prior surgical experiences, and the type of surgery are significant demographic and procedural factors influencing preoperative anxiety. For example, women and patients with past negative surgical experiences report higher levels of anxiety in preoperative waiting areas.[11] Additionally, increasing the information provided to patients during the waiting process has been emphasized as a critical intervention to reduce anxiety.[8]

Preoperative anxiety and surgical fear are well-known to negatively affect patients' surgical experiences and outcomes. However, the impact of OR waiting time on these psychological conditions, particularly in specialized surgical fields such as urinary system surgery, has not been adequately studied. Understanding this issue has become a priority in modern health care. Findings from such research could guide improvements in preoperative processes and better address patients' psychological support needs. As a result, reducing surgical fear, enhancing patient satisfaction, and achieving more favorable surgical outcomes could be facilitated. The aim of this study is to examine the effect of waiting time in the OR on surgical fear and preoperative anxiety in patients undergoing urinary system surgery.

In this study, the following hypotheses were tested:

$H1_1$. Waiting time on the surgical stretcher in the OR affects surgical fear.

$H1_2$. Waiting time on the surgical stretcher in the OR affects anxiety.

Materials and Methods

Ethical Aspect of the Study

Ethical approval for the study was obtained from the Non-Interventional Research Ethics Committee of Bitlis Eren University (Turkey) (Approval No: E-84771431-050.01.04-119822). Patients were informed about the study, and their written and verbal consent was obtained.[12] All stages of the research were conducted in accordance with the ethical principles outlined in the Declaration of Helsinki by the World Medical Association.[13]

Type, Location, and Time of the Study

The study was conducted as a comparative cross-sectional study in a state hospital located in eastern Turkey between December 1, 2023, and July 1, 2024. Existing literature was reviewed to identify a reference point for the relationship between preoperative waiting time and surgical fear and anxiety. Putri et al,[8] reported that waiting times exceeding 30 minutes increased anxiety and fear. The STROBE (STrengthening the Reporting of OBservational studies in Epidemiology) checklist was used for reporting the study.[14] Patients were divided into 2 groups based on their waiting time on the surgical stretcher in the OR: those with a waiting time of less than 30 minutes (group A, n = 82) and those with a waiting time of more than 30 minutes (group B, n = 68).

Sample of the Study

The population of the study consisted of patients who underwent urinary system surgery in the urology clinic of a state hospital in eastern Turkey between December 1, 2023, and July 1, 2024. The sample size of the study was calculated using the G Power 3.1.9.7 software (Düsseldorf/ Germany). Cohen's (d) standardized effect size table was used for sample size calculation.[15] With a 2-tailed hypothesis, correlation pH1: 0.3, α error: 0.05, β error: 0.05, and a power of 95%, the minimum required sample size was determined to be 138 participants. To account for potential data losses, the sample size was increased by 10%. The study was completed with the analysis of data from (N = 150) patients.

Sampling Criteria

Inclusion and Exclusion Criteria

Inclusion criteria included: (1) undergoing urinary system surgery, (2) age over 18 years, (c) no hearing, speech, or language-related problems, (d) able to speak and write in Turkish, (e) no psychological disorders that could affect fear and anxiety, (f) no use of medications that could alter fear and anxiety levels, and (g) willing to participate in the study.

Exclusion criteria included: (1) cancellation of the surgery after the patient was included in the study, (2) withdrawal from the study by the patient's own decision after inclusion, and (3) patients who were given premedication.

Data Collection Tools

The research data were collected through three forms. The "Descriptive Characteristics Form" was used to determine the demographic and basic characteristics of the patients. To assess patients' levels of anxiety, hunger, thirst, and the urge to urinate (discomfort levels), the "Visual Analog Scale" (VAS) and the "Surgical Fear Questionnaire" (SFQ) were used.

Descriptive Characteristics Form

The Descriptive Characteristics Form included questions designed to determine the patients' age, gender, marital status, educational background, history of previous surgeries, and the name of the current surgery.

Visual Analog Scale

The VAS is used to convert various subjective data, such as pain, anxiety, hunger, and thirst, into objective data. It consists of a 100-mm line drawn on a vertical or horizontal axis, with "none" labeled at the bottom and "the highest level of sensation" labeled at the top. A score of 0 indicates no anxiety, a score of 1 to 4 represents mild anxiety, a score of 5 to 6 reflects moderate anxiety, and a score of 7 to 10 indicates severe anxiety.[16,17]

Surgical Fear Questionnaire (SFQ)

The SFQ was developed by Theunissen et al[18] in 2014 to assess the fear levels of patients undergoing surgery. In the original scale, the Cronbach's α values were calculated as follows: short-term fear, 0.86; long-term fear, 0.88; and total Cronbach's α, 0.92. The Turkish validity and reliability study was conducted by Bağdigen and Karaman Özlü[19] in 2018. In the Turkish adaptation, the Cronbach's α values were as follows: short-term fear, 0.96; long-term fear, 0.90; and total Cronbach's α, 0.93. The scale consists of 8 items scored between 0 and 10 and is divided into 2 subscales: the first 4 items measure fear of short-term surgical outcomes, while the last 4 items assess fear of long-term surgical outcomes. Subscale scores are obtained by summing the relevant items, and the total score is derived by summing all items. Subscale scores range from 0 to 40, and total scores range from 0 to 80, with higher scores indicating greater surgical fear.[18,19] In this study, the Cronbach's α values were calculated as follows: short-term fear, 0.88; long-term fear, 0.86; and total Cronbach's α, 0.90.

Data Collection of the Study

Assessment Times

Two assessment times were determined to collect the study data. During these assessment times, patients' levels of anxiety, hunger, thirst, the urge to urinate (discomfort), and fear were evaluated and recorded on the data collection form.

T0. The evaluation conducted immediately before patients were taken to the OR.

T1. The evaluation conducted immediately before patients were placed on the operating table.

Preliminary Application

A preliminary application was conducted to evaluate the suitability of the data collection forms. Since no revisions were required for the data collection forms, the data from the preliminary application were included in the study.

One day before the surgery, patients were informed about the procedure, and their questions were answered. Written consent was obtained from patients who volunteered to participate in the study. The Descriptive Characteristics Form from the data collection forms was provided to the volunteering patients, and they were asked to complete the questions.

T0 Assessment

Immediately before the patients were taken to the OR, their levels of anxiety, hunger, thirst, and the urge to urinate (discomfort) were assessed using the VAS. To determine their fear levels, patients were asked to respond to the SFQ. The patients' responses were recorded on the data collection form.

T1 Assessment

Immediately before the patients were placed on the operating table, their levels of anxiety, hunger, thirst, and the urge to urinate (discomfort) were assessed using the VAS. To determine their fear levels, patients were asked to respond to the SFQ. The patients' responses were recorded on the data collection form.

Statistical Analysis of Data

The statistical analysis of the data was performed using the SPSS 27.0 package program for Windows (IBM Corp.). Descriptive statistics were presented as number (n) and percentage (%) for categorical variables, and as mean ± standard deviation for numerical variables. The normality of distribution for continuous variables was assessed using the Kolmogorov-Smirnov and Shapiro-Wilk tests. Since the data were normally distributed, the Independent Sample *t* test was used to compare the means of two groups. Linear regression analysis was employed to determine the effect of waiting time on the surgical stretcher in the operating room on the variables. A value of *P* less than .05 was considered statistically significant.

Results

Table 1 presents the findings regarding the comparison of descriptive characteristics of patients in groups A and B, such as age, body mass index (BMI), gender, educational status, marital status, previous surgery history, and type of surgery. According to the analyses performed, no statistically significant difference was found between groups A and B. These results indicate that the descriptive characteristics of both groups were similar and that the evaluation outcomes were based on the homogeneous distribution of the patient groups (Table 1).

Table 1
Comparison of Descriptive Characteristics of Patients in Groups A and B (N = 150)

	Group A (n = 82) ≥30 min n (%)	Group B (n = 68) ≤31 min n (%)	Test/*P*
Age			
≥65	74 (49.3)	66 (44.1)	X^2 = 2.275
≤66	8 (5.3)	2 (1.3)	*P* = .088
BMI*			
≥24.9	34 (22.6)	38 (25.4)	X^2 = 2.196
≤25	48 (32.0)	30 (20.0)	*P* = .138
Gender			
Female	15 (10.0)	10 (6.7)	X^2 = 0.662
Male	67 (44.7)	58 (38.7)	*P* = .359
Educational status			
Primary education	38 (25.3)	27 (18.0)	X^2 = 1.521
Secondary education	31 (20.7)	25 (16.7)	*P* = .467
Bachelor's degree and above	13 (8.7)	16 (10.7)	
Marital status			
Single	9 (6.0)	10 (6.7)	X^2 = 0.623
Married	73 (48.7)	58 (38.7)	*P* = .330
Previous surgery history			
Yes	61 (40.6)	54 (36.0)	X^2 = 4.818
No	21 (14.0)	14 (9.3)	*P* = .111
Type of surgery			
Ureterorenoscopic stone	38 (24.0)	30 (21.3)	X^2 = 3.042
Fragmentation	8 (4.0)	5 (4.7)	*P* = .969
Varicocelectomy	5 (2.7)	4 (3.3)	
Percutaneous nephrolithotomy	4 (2.0)	3 (2.7)	
Cystoscopy	4 (2.7)	3 (2.0)	
Hydrocelectomy	4 (2.7)	4 (2.7)	
Epididymal cyst	3 (1.3)	3 (2.7)	
Transobturator tape	6 (4.0)	4 (2.7)	
Transurethral prostate resection	4 (2.7)	6 (4.0)	
Transurethral bladder resection	1 (0.7)	-	
Orchiectomy	2 (1.3)	4 (2.7)	
Scrotal abscess	3 (2.0)	2 (1.3)	
Internal urethrotomy			

* Body Mass Index.

Table 2 presents the findings related to the comparison of physiological and psychological parameters of patients in groups A and B during the T0 and T1 periods. In the T0 evaluation, the assessed parameters included systolic arterial pressure, diastolic arterial pressure, pulse, SpO_2, body temperature, hunger score, thirst score, urinary discomfort score, anxiety score, short-term fear score, long-term fear score, and total fear score. No significant difference was found between groups A and B for these parameters ($P > .05$ $P > .05$ $P > .05$). This indicates that the preoperative baseline conditions of the patients were similar between the groups (Table 2).

In the T1 evaluation, significant differences were observed in some parameters. Among the parameters showing significant differences, systolic arterial pressure ($P = .041$) and body temperature ($P = .008$) were notable. Additionally, thirst score ($P = .002$), urinary discomfort score ($P = .001$), anxiety score ($P = .002$), short-term fear score ($P = .001$), and total fear score ($P = .001$) also demonstrated significant differences. On the other hand, differences in diastolic arterial pressure, pulse, SpO_2, hunger score, and long-term fear score were not significant ($P > .05$) (Table 2).

Table 3 presents the results of multiple linear regression models evaluating the effect of waiting time before surgery in the operating room on physiological and psychological variables. A significant effect was determined for systolic arterial pressure ($\beta = 0.645$, $P = .001$) and body temperature ($\beta = 0.535$, $P = .001$). A significant effect was also found for thirst ($\beta = 0.527$, $P = .001$) and urinary discomfort ($\beta = 0.725$, $P = .001$). Furthermore, significant effects were determined for anxiety ($\beta = 0.637$, $P = .001$), short-term fear ($\beta = 0.788$, $P = .001$), and total fear ($\beta = 0.536$, $P = .001$). The effects on diastolic

Table 2
Comparison of T0 Evaluation Findings of Patients in Groups A and B (N = 150)

	Group A (n = 82) ≥30 min Mean ± SD*	Group B (n = 68) ≤31 min Mean ± SD*	Test/*P*
Systolic arterial pressure (mm Hg)			
T0	127.17 ± 21.74	124.41 ± 18.45	z = −1.531 *P* = .132
T1	134.17 ± 26.22	137.17 ± 26.2	**z = −2.094 *P* = .041**
Diastolic arterial pressure (mm Hg)			
T0	81.70 ± 13.85	78.80 ± 13.99	*t* = −1.270 *P* = .206
T1	81.02 ± 12.72	78.97 ± 10.82	*t* = −0.174 *P* =.862
Pulse (beats/min)			
T0	80.89 ± 12.68	80.26 ± 12.56	*t* = −0.302 *P* = .763
T1	80.67 ± 12.66	90.38 ± 86.85	*t* = 1.000 *P* = .319
SPO_2 (%)			
T0	96.11 ± 1.33	95.75 ± 1.57	*t* = −0.250 *P* = .804
T1	97.48 ± 1.68	98.10 ± 1.18	*t* = −0.109 *P* = .914
Body temperature (°C)			
T0	36.22 ± 0.7	36.14 ± 0.5	*t* = −0.194 *P* = .846
T1	36.01 ± 0.6	35.78 ± 0.4	***t* = −2.670 *P* = .008**
Hunger (VAS)*,†,‡			
T0	4.84 ± 3.28	4.76 ± 3.13	*t* = −0.167 *P* = .868
T1	4.92 ± 3.92	5.35 ± 4.11	*t* = −1.328 *P* = .189
Thirst (VAS)†			
T0	4.98 ± 3.24	4.89 ± 3.17	*t* = −1.040 *P* = .299
T1	5.21 ± 3.12	5.98 ± 4.22	***t* = −3.115 *P* = .002**
Urinary discomfort (VAS)†			
T0	3.14 ± 3.94	3.29 ± 3.38	*t* = −0.979 *P* = .328
T1	3.98 ± 3.22	4.45 ± 4.18	***t* = −3.359 *P* = .001**
Anxiety (VAS)†			
T0	5.20 ± 3.38	5.13 ± 3.42	*t* = −0.667 *P* = .505
T1	6.02 ± 3.95	6.78 ±3 .45	***t* = −3.180 *P* = .002**
Short-term fear (SFQ)‡			
T0	14.33 ± 10.50	14.61 ± 11.38	*t* = −1.568 *P* = .118
T1	22.42 ± 13.56	27.67 ± 10.64	***t* = −5.201 *P* = .001**
Long-term fear (SFQ)‡			
T0	15.12 ± 12.34	14.98 ± 13.45	*t* = −1.248 *P* = .213
T1	15.63 ± 14.45	16.12 ± 11.24	*t* = −1.705 *P* = .089
Total fear (SFQ)‡			
T0	29.25 ± 16.20	29.59 ± 17.62	*t* = −1.520 *P* = .130
T1	38.05 ± 19.81	43.79 ± 15.48	***t* = −4.242 *P* = .001**

Bold value indicates significant values.
* Mean ± standard deviation, T0: the evaluation conducted immediately before patients were taken to the operating room, T1: the evaluation conducted immediately before patients were placed on the operating table.
† Visual Analog Scale.
‡ Surgical Fear Questionnaire.

arterial pressure, pulse, SpO_2, hunger, and long-term fear were not statistically significant ($P > .05$) (Table 3).

Discussion

This study, conducted to evaluate the effect of waiting time before surgery in the OR on surgical fear and preoperative anxiety, determined that waiting time had significant effects on psychological variables such as surgical fear, anxiety, short-term fear, and total fear. Prolonged waiting times during the surgical process increased patients' fear and anxiety levels, which could negatively impact surgical experiences and outcomes. Particularly, increases in short-term fear and anxiety levels indicate that waiting time is an important source of stress during surgical processes. The hypotheses tested in the study, $H1_1$: waiting time affects surgical fear and $H1_2$: waiting time affects anxiety, were confirmed. These findings highlight the importance of more effective management of waiting times in organizing preoperative processes.

The findings of this study, which evaluated the effect of waiting time in the OR on surgical fear and preoperative anxiety, are largely consistent with the existing literature. Eberhart et al.[1] emphasized that preoperative waiting time has a significant impact on anxiety and can negatively affect surgical outcomes. Similarly, Wakana et al[3] stated that preoperative waiting time is one of the main sources of psychological stress and significantly increases anxiety. These results support the significant relationship between waiting time and short-term fear and anxiety found in this study.

However, the study also has aspects that differ from the existing literature. For example, Tozzi et al[4] demonstrated that anxiety during surgical processes is often influenced by demographic factors and previous surgical experiences. In contrast, this study found that waiting time had a central effect on surgical fear and anxiety, independent of these factors. Additionally, while Shen et al[11] examined the impact of waiting time in the operating room on preoperative anxiety indirectly, the findings of this study indicated that this relationship is direct and significant.

In this study, groups A and B exhibited similar distributions in terms of age, BMI, gender, educational status, marital status, previous surgery history, and types of surgery. The absence of statistically significant differences ($P > .05$) indicates a homogeneous distribution between the two groups and suggests that the groups are comparable. This result demonstrates that the psychological and physiological effects of waiting time in preoperative processes can be evaluated without notable systematic differences between the groups.

The T0 evaluation indicates that there were no significant differences between groups A and B in terms of the assessed physiological and psychological parameters at the preoperative baseline

Table 3
Multiple Linear Regression Models for the Effect of Waiting Time Before Surgery in the Operating Room on Physiological and Psychological Variables (N = 150)

	Variables	B (Odds Ratio)	*t*/*P*	95%CI Min-Max
Waiting time	Systolic arterial pressure (mm Hg)	**0.645**	***t* = −4.300 *P* = .001**	**0.257-0.379**
	Diastolic arterial pressure (mm Hg)	0.046	*t* = −1.115 *P* = .750	0.013-0.084
	Pulse (beats/min)	0.140	*t* = −1.022 *P* = .308	0.123-0.210
	SPO_2 (%)	0.076	*t* = 1.016 *P* = .546	0.045-0.176
	Body temperature (°C)	**−0.535**	***t* = −3.670 *P* = .001**	**−0.630 to 0.185**
	Hunger (VAS)*	0.071	*t* = 0.860 *P* = .391	0.043-0.338
	Thirst (VAS)*	**0.527**	***t* = 7.544 *P* = .001**	**1.488-2.543**
	Urinary discomfort (VAS)*	**0.725**	***t* = 8.345 *P* = .001**	**1.635-3.724**
	Anxiety (VAS)*	**0.637**	***t* = 10.046 *P* = .001**	**1.672-2.491**
	Short-term fear (SFQ)†	**0.788**	***t* = 15.575 *P* = .001**	**0.799-1.032**
	Long-term fear (SFQ)†	−0.045	*t* = 0.551 *P* = .582	−0.221 to 0.124
	Total fear (SFQ)†	**0.536**	***t* = 3.945 *P* = .001**	**1.234- 2.456**

* Visual Analog Scale.
† Surgical Fear Questionnaire.

($P > .05$). This finding shows that the initial conditions of both groups were similar and that the study outcomes were not influenced by systematic differences between the groups. This provides an important foundation for the reliability of the study findings.

The results obtained from the T1 evaluation indicate that waiting time had significant effects on certain physiological parameters. Systolic arterial pressure and body temperature showed significant differences depending on the waiting time. Urinary discomfort was also assessed within this scope, and it was determined that waiting time had a significant effect on this physiological parameter. These findings suggest that prolonged waiting in the OR may increase patients' physiological stress responses and highlight the need to consider these changes in the surgical preparation process.

The finding from the T1 evaluation that waiting time leads to physiological changes, such as an increase in systolic arterial pressure and a decrease in body temperature, aligns with some studies in the literature. For instance, Eberhart et al[1] stated that prolonged preoperative waiting times increase stress responses, affecting the cardiovascular system and causing changes in physiological parameters. Additionally, the study by Rammant et al[6] emphasized that preoperative stress could influence patients' physiological regulation. Our study contributes new insights to the literature by identifying a decrease in body temperature associated with waiting time, a topic that has been limitedly explored. This finding suggests that prolonged waiting in the OR may have a negative impact on patients' thermoregulation mechanisms. While consistent with existing data in the literature, the study findings provide a unique perspective on the effects of waiting time on body temperature.

From a psychological perspective, the study determined that waiting time had significant effects on anxiety, short-term fear, and total fear. The increase in psychological variables such as anxiety and fear clearly highlights the psychological burden of the preoperative period on patients. The lack of a significant effect on long-term fear suggests that short-term psychological reactions are more pronounced. These findings indicate that effective management of waiting times in the preoperative period is crucial for reducing patients' psychological stress and improving their surgical experiences.

The significant effects of waiting time on anxiety, short-term fear, and total fear found in the study are largely consistent with findings in the literature. Eberhart et al[1] noted that preoperative waiting time increases psychological reactions such as fear and anxiety in patients and emphasized the importance of effective management during this process. Similarly, Wakana et al[3] showed that the operating room waiting environment increases patients' anxiety levels, with short-term effects being more pronounced, aligning with the prominence of short-term fear observed in this study. Putri et al[8] highlighted that waiting time elevates anxiety levels, thereby increasing the psychological burden during the surgical process. These studies demonstrate that preoperative waiting time predominantly impacts short-term psychological effects.

However, this study found no significant effect of waiting time on long-term fear. This result differs from the findings of Shen et al,[11] who indicated that long-term fear is associated with demographic factors and prior surgical experiences. This discrepancy suggests that long-term fear may be influenced more by personal history and environmental factors than by waiting time. While this study supports existing knowledge in the literature, it provides a more specific focus on short-term psychological effects and highlights the potential differences in determinants of long-term fear. These findings emphasize the need to prioritize short-term effects in the psychological management of waiting time.

Waiting time has been shown to have significant effects on physiological variables. Notable changes were observed in stress-related physiological responses, such as systolic arterial pressure and body temperature. Additionally, subjective physiological sensations such as thirst and urinary discomfort were also found to be influenced by waiting time. This suggests that prolonged waiting times during the preoperative period may increase physiological stress responses, highlighting the need to consider these effects in the surgical preparation process.

The impact of waiting time on physiological variables is supported by various studies in the literature. Kinjo et al[2] reported that prolonged waiting times during surgical procedures increase physiological stress responses in patients, negatively affecting the circulatory system. Specifically, changes in cardiovascular parameters align with the finding of increased systolic arterial pressure in our study. Additionally, the study by D'hulster et al[5] indicated that stress factors during the surgical preparation process could influence body temperature regulation. These findings are consistent with the observed decrease in body temperature due to waiting time in our study. However, literature addressing subjective physiological sensations such as thirst and discomfort from the urge to urinate is limited. By directly addressing these parameters, our study offers a unique contribution to the literature. It appears that the physiological effects of waiting time should be further evaluated in future studies.

In terms of psychological variables, waiting time has been shown to have a strong impact on anxiety, short-term fear, and total fear. The psychological burden experienced by patients before surgery is exacerbated by the direct effects of waiting time. However, the finding that long-term fear is not influenced by waiting time suggests that such fears are more closely related to patients' past experiences or personal factors. These findings highlight the need to prioritize the management of psychological variables in the preoperative period and emphasize the importance of providing psychological support interventions for patients.

The impact of waiting time on psychological variables is widely supported in the current literature. Eberhart et al[1] emphasized that waiting time in the preoperative period increases psychological responses such as anxiety and fear, negatively affecting patients' overall surgical experience. Similarly, the study by Shen et al[11] noted that waiting time particularly heightens short-term fear and anxiety, while its effects on long-term fear are limited. This aligns with our

findings, where short-term fear and anxiety were significantly affected, whereas long-term fear remained unaffected.

However, the study by Putri et al[8] suggested that waiting time could influence both short-term and long-term fears. Our study differs from this literature by indicating that long-term fear is more likely associated with other variables such as patients' previous surgical experiences or personal factors. These findings underscore the impact of waiting time on psychological burden while also revealing that long-term fear is shaped by different mechanisms. This highlights the necessity of prioritizing supportive interventions targeting anxiety and short-term fear during the preoperative period.

The findings of this study significantly contribute to the literature by highlighting the effects of waiting time in the OR on patients' psychological and physiological states. Notably, the pronounced impact of waiting time on psychological variables such as anxiety and short-term fear underscores the importance of focusing on these parameters in the management of surgical processes. From a practical perspective, planning psychological support interventions to make the waiting period more comfortable for patients could enhance patient satisfaction and improve surgical outcomes. In the context of nursing education, providing students with more comprehensive training to address the psychosocial effects of such situations could offer valuable contributions to professional practice. Future research could fill knowledge gaps by examining the effects of waiting time in larger patient populations and across different surgical fields. Additionally, a detailed investigation into individual and environmental factors influencing this process could foster a more comprehensive understanding.

Limitations

The limitations of this study include the fact that the sample was drawn from a single hospital, which limits the generalizability of the results to other populations. While the effects of waiting time were evaluated, individual differences among patients and other environmental factors were not examined in detail. Additionally, the study focused solely on the preoperative period, and the long-term effects of waiting time were not assessed. This indicates that the findings are limited to a specific time frame.

Conclusion

This study has demonstrated that waiting time before surgery in the OR has significant effects on patients' psychological and physiological states. Waiting time, in particular, led to notable increases in psychological variables such as anxiety, short-term fear, and total fear, while also causing significant changes in some physiological parameters. These findings indicate that waiting time is a critical factor directly impacting patients' surgical experiences and outcomes. More effective management of preoperative processes could help mitigate these adverse effects. The study highlights the importance of preoperative supportive interventions, providing valuable insights for improving patient care.

CRediT authorship contribution statement

Aynur Koyuncu: Validation, Resources, Methodology, Conceptualization. **Erdoğan Yakıt:** Writing – review & editing, Formal analysis, Data curation.

Declaration of Competing Interest

None to report.

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