

Parameters that Affect the Comfort Level of Pregnant Women Before Cesarean Section: Fasting and Anxiety

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Purpose: *This study aimed to investigate whether fasting time and anxiety parameters affect pregnant women's preoperative comfort levels.*

Design: *Cross-sectional descriptive study.*

Methods: *Data were collected from pregnant women using the State-Trait Anxiety Inventory (STAI), General Comfort Questionnaire (GCQ), and Numerical Rating Scale.*

Findings: *The mean age of the participants was 29.15 ± 4.54 years, and the spinal anesthesia rate was 65.5%. The mean fasting time was 13.16 ± 2.38 hours for solid food and 10.57 ± 2.91 hours for liquid food. The mean GCQ score was 129.82 ± 12.66 , while the mean STAI subscale scores were 46.72 ± 9.37 and 43.65 ± 7.95 . Moderately negative correlation was found between the total GCQ and STAI scores, while weak positive correlation was observed between the STAI score and the thirst sensation and mouth dryness.*

Conclusions: *The preoperative process negatively affects comfort levels of pregnant women. Interventions that reduce the fasting time and anxiety level of pregnant women will increase comfort.*

Keywords: *anxiety, cesarean section, comfort, preoperative fasting.*

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THE CONCEPT OF COMFORT is both individual and complex, and it is considered to be a basic human need.^{1,2} Comfort is known to be related to care.¹ The provision of comfort is intended to achieve basic human requirements such as relief, ease, and transcendence.³ In the health care context, achieving relief involves meeting the spe-

cific needs of the patient (ie, providing analgesia for pain relief).¹⁻³ In a caring context, relief is the elimination of all symptoms. The aim of nursing care is to evaluate a symptom (eg, feeling cold or having nausea) and then provide interventions to eradicate it (eg, warming and antiemetic).⁴ Moreover, ease is defined as “a state of tranquility or contentment,” while transcendence is considered to be “a state of comfort in which patients are able to rise above their challenges.”^{1,3} A patient's lived experience (eg, surgery, pain, nausea, vomiting, hypothermia, anxiety) may represent the principal reason behind any decrease in comfort observed during an operation or procedure.⁵ In general, comfort is a desired outcome for nursing care for patients and their families in health care.⁶ Comfort has always been an important concept in nursing and is particularly important in definition of the nature of nursing knowledge, discipline, and profession.⁷

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Anxiety among pregnant women is between 15% and 23% and is associated with increased risk of negative outcomes in both mother and child.⁸ The possibility that something could go wrong with the baby during birth is one of the factors that would lead to the highest level of anxiety in pregnant woman.⁹ In addition, surgical procedures, including cesarean section, are widely known to be stressful and alarming for patients.¹⁰ A study by Rosen et al reported that preoperative anxiety is important and ranged from 11% to 80%.¹¹ Anxiety is an unpleasant feeling that compromises patients' comfort and well-being.¹² Wilson and Kolcaba¹³ have reported that anxiety associated with surgery reduces patients' psychospiritual comfort levels. Hence, preoperative anxiety has a negative impact on surgery, anesthesia, and postoperative recovery.¹⁴ The determination of preoperative anxiety in patients undergoing an operation is of great importance to alleviate it.¹²

Adequate preparation before elective cesarean section provides a rapid return to normal physiological function for being able to care for their newborn.¹⁵ One of the most basic preparatory procedures in this regard involves depriving the patient of food and drink for a certain period of time.¹⁶ The restriction of the patient's oral intake is intended to prevent pulmonary aspiration by means of reducing the volume of the gastric contents.¹⁷ "Non/nil per os" (nothing by mouth) after midnight continues to be a common instruction for elective surgery patients.¹⁸ The American Society of Anesthesiologists (ASA) and Turkish Anesthesiology and Reanimation Society (TARS) have reported that patients who are due to undergo cesarean section under general anesthesia can consume solid food up to 8 hours before surgery and clear liquid up to 2 hours before surgery.^{19,20}

Overnight fasting before the surgery may cause metabolic, physiological, and psychological discomfort in patients.²¹ When the fasting period before cesarean section is prolonged, conditions such as hunger, thirst, mouth dryness, and headache are likely to occur.²² In particular, hypoglycemia is a common complication after long periods of fasting.¹⁸ Prolonged fasting can also cause an increase in the patient's anxiety level.^{17,18}

Health professionals can provide comfort by increasing their support for pregnant women dur-

ing the preanesthesia period and delivery.²³ This study aimed to investigate whether the fasting time and anxiety parameters affect pregnant women's preoperative comfort levels.

Methods

Study Design

This descriptive, cross-sectional study was conducted between May and August 2016 in the Obstetrics and Gynecology Hospital on the European side of Istanbul, Turkey. The study population consisted of pregnant women who were due to undergo elective cesarean section in the hospital. In terms of the power analysis, the required sample was determined to comprise 108 participants when an alpha of 0.05 and a beta of 0.20 were considered. Owing to the possibility of exclusions, therefore, some 114 pregnant women were initially included in the study. A total of four pregnant women were excluded from the study. Three of those women had an urgent cesarean section during the data-collection period. One woman received intravenous infusion (Lactated Ringer's and 5% dextrose). Hence, the final study population comprised 110 pregnant women. The inclusion criteria for the study included an elective cesarean delivery, the absence of any psychiatric illnesses or any problems that prevent communication, and volunteering to participate in the study. The exclusion criteria included an emergency cesarean section, the presence of chronic illness, administration of an intravenous infusion before the data of the pregnant woman are obtained by the researcher, a history of gestational diabetes mellitus or diabetes mellitus, and pregnancy-related hypertension or preeclampsia/eclampsia.

Measures

At the hospital in which this study was conducted, before undergoing cesarean section, pregnant women are admitted to a ward with 27 beds which is located near the operating room. After the researcher had introduced herself and explained the purpose of the study, the volunteer signed a voluntary consent form. Then, the researcher filled out a form detailing the personal descriptive characteristics of the pregnant women. Before undergoing cesarean section, the participants' levels of

hunger, thirst, mouth dryness, and headache were assessed by using the Numerical Rating Scale (NRS). The peripheral blood glucose level was evaluated at the last stage.

DEMOGRAPHIC QUESTIONNAIRE. The form used to collect the participants' demographic data was created by the researchers on the basis of a literature search.²³⁻²⁵ The form consisted of 28 questions about the patients, including their age, height, weight, fertility, history of pregnancy, history of chronic illness, education level, smoking status, information about prior surgeries, indication(s) for cesarean section, anesthesia type, duration of fasting, and blood glucose level.

NUMERICAL RATING SCALE. The NRS was used to evaluate the participants' levels of hunger, thirst, mouth dryness, and headache before undergoing cesarean section. The NRS is valuable because it allows for numerically unmeasurable values to be converted into numeric values. At each end of a 10-cm-long horizontal line, the end-points of the parameter to be evaluated are written, and the participant is asked to indicate where his or her current status is located on the line. The test has been validated from 1950s, and it agreed to be an acceptable, safe, and easily applicable test in the literature worldwide.²⁶

STATE-TRAIT ANXIETY INVENTORY. The State-Trait Anxiety Inventory (STAI) was originally developed by Spielberger et al.²⁷ Later, the Turkish validity and reliability of the STAI were studied by Öner and Le Compte.²⁸ The STAI consists of two parts, each of which contains 20 questions intended to measure the state and trait anxiety levels, respectively. State anxiety determines how an individual feel about himself/herself at a particular moment and subject to certain conditions, while trait anxiety refers to how an individual feel about himself/herself independently of the situation and any conditions. When responding to the part of the scale that measures state anxiety, each participant is asked to choose either "none," "some," "very much," or "completely" according to the severity of his/her feelings, thoughts, or behaviors as reflected by the items. When responding to the trait anxiety part of the scale, each participant is asked to choose either "never," "sometimes," "very often," or "almost always" ac-

ording to the frequency of his/her feelings, thoughts, or behaviors as reflected by the items. The grading of the items is performed on a four-point Likert scale, with the total score for each subscale ranging from 20 to 80. It has been established that a score of 20-39 points on the scale is indicative of "mild" anxiety, 40-59 points indicates "medium" anxiety, 60-79 points indicates "severe" anxiety, and 80 points indicates "panic."²⁸

GENERAL COMFORT QUESTIONNAIRE. The General Comfort Questionnaire (GCQ) was first developed by Kolcaba and then adapted for the Turkish population by Kuguoglu and Karabacak.^{2,29} Correlation coefficients are evaluated as 0.00-0.29 = very weak, 0.30-0.49 = weak, 0.50-0.69 = moderate, 0.70-0.89 = high, and 0.90-1.00 = too high relationship.³⁰ The Cronbach's alpha coefficient of the GCQ is 0.85, while the reliability of the scale is considered to be high.²⁹ The GCQ is used to determine comfort requirements, as well as to measure the effectiveness of interventions aimed at fostering comfort. The GCQ consists of 48 items, and it is rated on a four-point Likert scale.² There are 24 positive and 24 negative questions included in the GCQ, with the positive and negative statements being mixed. High scores in relation to the positive statements indicate a high level of comfort (4), while low scores (1) indicate a low level of comfort. During the assessment of the scale, the negative scores obtained are inversely coded. The total score obtained is divided by the number of scale items, and the average value is determined. Then, the result is indicated in a one-to-four distribution. The total scores range from 48 to 192. A higher score reflects a higher level of comfort.²

Statistical Analysis

The distribution of the continuous variables, such as age, body mass index, and total solid or liquid fasting, investigated in this study was analyzed by means of the Shapiro-Wilk test. The data were expressed in terms of number, percentage, mean, and median. The differences between the groups were assessed using the Mann-Whitney U test and the Kruskal-Wallis variance analysis. To analyze the relationship between the total solid and liquid fasting duration and the NRS, STAI, and GCQ scores, a Pearson (r) or Spearman (ρ) correlation analysis

was performed, depending on the distribution of the variables. The SPSS Statistics 21.0 program was used for all the statistical analyses and calculations.

Ethical Considerations

An explanation was given to all participants that the confidentiality of the gathered data would be ensured. Informed consent was obtained from all participants before starting the study. In addition, written permission was obtained from the hospital. Local ethics board approved this study (535, 18/11/2015).

Results

The ages of the 110 participating pregnant women ranged from 19 to 43 years, with the mean age being 29.15 ± 4.54 years. The mean body mass index was 30.49 ± 4.57 kg/m². Among the participants, 44.5% (n = 49) were elementary school graduates. The mean number of pregnancies was 2.7 ± 0.91 (min = 2, max = 7). When the cesarean section indications were analyzed, 99.1% (n = 109) were found to be repeated cesarean sections. Spinal anesthesia was performed in 72 (65.5%) cases, while 98 (89.1%) participants were classified as ASA I. The mean fasting duration was 13.16 ± 2.38 hours (min = 8, max = 19.58) for solids and 10.57 ± 2.91 hours (min = 3.25, max = 15.58) for liquids. The mean peripheral blood glucose level before cesarean section was 77.21 ± 9.78 (min = 57, max = 108).

The mean state anxiety score of the pregnant women was 46.72 ± 9.37 , while their mean trait anxiety score was 43.65 ± 7.95 . The mean general comfort score was 129.82 ± 12.66 (Table 1). The levels of hunger, thirst, mouth dryness, and headache were assessed using the NRS before the participants underwent cesarean section. The levels of thirst (45.4%) and mouth dryness (35.4%) were found to be the highest (Table 2).

Very weak negative correlation was identified between the solid fasting NRS score and the state anxiety score ($r = 0.189$, $P = .048$), the relief level for the GCQ ($r = -0.228$, $P = .017$), and the total GCQ score ($r = -0.212$, $P = .026$). There was also weak negative correlation between the thirst NRS score and the trait anxiety score ($r = 0.295$, $P = .002$), as well as very weak negative correlation between the psychospiritual dimension ($r = -0.259$, $P = .006$) of the GCQ and the total GCQ score ($r = -0.193$, $P = .044$). Positive correlation was noted between the mouth dryness NRS score and the trait anxiety score ($r = 0.334$, $P = .001$), while very weak negative correlation was observed between the psychospiritual ($r = -0.309$, $P = .001$) and social ($r = -0.303$, $P = .001$) dimensions of the GCQ (Table 3).

Moderate negative correlation was found between the total GCQ score and the state anxiety score. Furthermore, moderate negative correlation was found between the state anxiety score and the psychospiritual ($r = -0.615$, $P = .001$) and

Table 1. Mean STAI and GCQ Scores in Pregnant Women Before Cesarean Section

	Mean \pm SD	Minimum-Maximum	Median
STAI Scores			
State anxiety score	46.72 ± 9.37	20-74	47.0
Trait anxiety score	43.65 ± 7.95	27-66	42.5
Contexts of Comfort			
Physical	30.11 ± 5.13	18-42	31.0
Psychospiritual	35.67 ± 4.83	22-48	35.0
Environmental	36.00 ± 4.85	23-48	36.0
Social	28.04 ± 2.75	19-34	28.0
Types of Comfort			
Relief	43.25 ± 5.12	29-54	43.5
Ease	47.78 ± 5.42	34-62	48.0
Transcendence	38.79 ± 5.15	27-54	39.0
Total score	129.82 ± 12.66	93-160	130
GCQ assessment	2.70 ± 0.26	1.94-3.33	2.71

GCQ, General Comfort Questionnaire; STAI, State-Trait Anxiety Inventory; SD, standard deviation.

Table 2. NRS Scores of Hunger, Thirst, Mouth Dryness, and Headache

NRS Score	Hunger, n (%)	Thirst, n (%)	Mouth Dryness, n (%)	Headache, n (%)
0	14 (12.7)	6 (5.5)	10 (9.1)	94 (85.5)
1	3 (2.7)	2 (1.8)	3 (2.7)	1 (0.9)
2	2 (1.8)	1 (0.9)	2 (1.8)	1 (0.9)
3	4 (3.6)	7 (6.4)	3 (2.7)	3 (2.7)
4	6 (5.5)	4 (3.6)	6 (5.5)	0 (0)
5	25 (22.8)	15 (13.6)	19 (17.3)	2 (1.8)
6	14 (12.7)	4 (3.6)	6 (5.5)	4 (3.7)
7	9 (8.2)	4 (3.6)	11 (10.0)	0 (0)
8	9 (8.2)	10 (9.1)	8 (7.3)	2 (1.8)
9	4 (3.6)	7 (6.4)	3 (2.7)	0 (0)
10	20 (18.2)	50 (45.5)	39 (35.4)	3 (2.7)

NRS, Numerical Rating Scale.

environmental ($r = -0.522$, $P = .001$) domains of the GCQ as well as the relief ($r = -0.523$, $P = 0.001$) and ease ($r = -0.529$, $P = .001$) levels. There was negative weak correlation between the trait anxiety score and the physical ($r = -0.370$, $P = .001$) and psychospiritual ($r = -0.432$, $P = .001$) domains as well as the relief ($r = -0.388$, $P = .001$) and ease ($r = -0.298$, $P = .002$) levels (Table 4).

There was very weak positive correlation identified between the physical ($r = 0.208$), social ($r = 0.209$), and relief ($r = 0.212$) scores for the GCQ and the total fasting duration for solids. However, there was no statistically significant relationship identified between the total fasting

duration for liquids and the GCQ and STAI scores (Table 5).

In addition, the duration of fasting for solids was found to be negatively correlated with the blood glucose level ($r = -0.197$, $P = .040$). There was no statistically significant relationship between total fluid fasting time and blood glucose level ($r = -0.065$, $P = .501$).

Discussion

In this study, the comfort level was found to be moderate, while the anxiety level was found to be slightly higher than moderate. The fasting time before undergoing cesarean section had the

Table 3. Correlation Between NRS Scores and STAI and GCQ Scores

	Hunger		Thirst		Mouth Dryness		Headache	
	r	P	r	P	r	P	r	P
State anxiety score	0.189	.048	-0.038	.694	0.081	.397	0.099	.303
Trait anxiety score	0.037	.704	0.295	.002	0.334	.001	-0.013	.889
Contexts of Comfort								
Physical	-0.177	.064	-0.168	.079	-0.180	.060	-0.154	.109
Psychospiritual	-0.130	.177	-0.259	.006	-0.309	.001	-0.094	.329
Environmental	-0.154	.109	0.031	.745	0.045	.639	-0.059	.542
Social	-0.139	.147	-0.166	.083	-0.302	.001	-0.178	.063
Types of Comfort								
Relief	-0.228	.017	-0.133	.165	-0.243	.011	-0.187	.051
Ease	-0.116	.228	-0.148	.122	-0.238	.012	-0.117	.223
Transcendence	-0.167	.082	-0.135	.161	-0.090	.348	-0.077	.422
Total	-0.212	.026	-0.193	.044	-0.237	.013	-0.175	.068

NRS, Numerical Rating Scale; GCQ, General Comfort Questionnaire; STAI, State-Trait Anxiety Inventory.

Bold values are statistically significant ($P < .05$).

Table 4. Correlation Between STAI and GCQ Scores

	State Anxiety		Trait Anxiety	
	r	P	r	P
Contexts of Comfort				
Physical	-0.434	.001	-0.370	.001
Psychospiritual	-0.615	.001	-0.432	.001
Environmental	-0.522	.001	-0.134	.162
Social	-0.047	.624	-0.005	.955
Types of Comfort				
Relief	-0.523	.001	-0.388	.001
Ease	-0.529	.001	-0.298	.002
Transcendence	-0.449	.001	-0.203	.033
Total	-0.621	.001	-0.367	.001

GCQ, General Comfort Questionnaire; STAI, State-Trait Anxiety Inventory.

Bold values are statistically significant ($P < .05$).

greatest effect on the levels of thirst and mouth dryness. Prolonged fasting before surgery was associated with patients' discomfort.¹⁸ According to the current guidelines, the intake of solid food is permitted up to 6 hours before receiving obstetric anesthesia, while the intake of clear liquids is permitted up to 2 hours before.¹⁹ Levy and Webster³¹ reported no cases of aspiration when they gave clear liquids to 2340 pregnant women up to 2 hours before elective cesarean section. However, it is still recommended that patients

fast overnight before undergoing cesarean section and other surgical procedures.

When evaluating the effects of fasting before cesarean section, it was observed that the sensations of thirst and mouth dryness were most commonly experienced. Crenshaw and Winslow²³ reported that the thirst sensation was moderate in the 51 women involved in their study. Dolgun et al³² found that 47.6% of 145 adult patients experienced thirst, while 30.3% experienced hunger. When they evaluated the levels of the experienced sensations using a scale ranging from 0–10, 20.3% of patients described their thirst sensation as being level eight and 25% described their hunger sensation as being level five. Thirst is important in relation to both maintaining a fluid balance and preventing dehydration. Even a very small amount of fluid loss can result in thirst.³³ Furthermore, thirst has been reported to be the symptom that affects patients the most.¹⁰ To prevent these potential complications, the preoperative fasting duration should be kept within an acceptable range.²¹ Yurashevich et al³⁴ determined that a patient educational pamphlet is effective at decreasing preoperative liquid fasting times in patients undergoing elective caesarean delivery. Verbal and written preoperative fasting instructions according to the ASA will improve patient compliance.³⁵ It is hence recommended that clear liquids

Table 5. Correlation Between Total Fasting Duration for Solids and Liquids and GCQ and STAI Scores

	Fasting Duration for Solids		Fasting Duration for Liquids	
	r	P	r	P
Contexts of Comfort				
Physical	0.208*	.029	0.073†	.448
Psychospiritual	0.096*	.316	0.076†	.429
Environmental	0.034*	.724	-0.115†	.233
Social	0.209*	.028	0.145†	.132
Types of Comfort				
Relief	0.212*	.026	0.02†	.829
Ease	0.168*	.080	0.057†	.552
Transcendence	0.054*	.576	-0.015†	.888
Total	0.179*	.061	0.035†	.713
State anxiety	-0.143*	.135	-0.147†	.125
Trait anxiety	0.027*	.783	0.023†	.815

GCQ, General Comfort Questionnaire; STAI, State-Trait Anxiety Inventory.

Bold values are statistically significant ($P < .05$).

*Pearson correlation coefficient.

†Spearman correlation coefficient.

should be given to patients up to 2 hours before they undergo surgery.¹⁹ Nurses must advocate the current recommendations and guidelines for the preoperative fasting period.⁵ Additional evidence-based findings could be obtained by conducting further comparative research on this issue.

Assessment and treatment of preoperative anxiety is very important during the preanesthesia phase of the perianesthesia experience.⁵ The participants in this study reported experiencing slightly higher than moderate anxiety, and their state anxiety scores were found to be higher than their trait anxiety scores. Surgical intervention, which is perceived by the individual as posing a threat to his/her health, is associated with a number of concerns, including the risk of death, feelings of pain, and loss of control over the body.^{9,24,25} The use of cesarean delivery also increases concerns about the baby.³⁶ Aydın et al²⁴ reported that 66% of pregnant women reported a high level of anxiety before undergoing cesarean section. Hepp et al³⁶ also found that the anxiety levels of pregnant women were high. Furthermore, Demirdağ and Karaoz³⁷ reported that anxiety was more commonly experienced than a sensation of thirst. It is, therefore, believed that reducing patients' anxiety levels would serve to increase their comfort levels both before and after cesarean section. Nurses can relieve the patient's anxiety during preanesthesia phase with knowledge/training, compassion, and reassurance.⁵

In the present study, the participating pregnant women's average GCQ score was above the medium level. This may be because the hospital in which the study was conducted is new, and, therefore, the physical environment is good. In the literature, no studies concerning the comfort of pregnant women before cesarean section were found. Previous studies have mostly investigated the postpartum comfort levels of mothers.^{38,39} As comfort is important during the preoperative period, further studies concerning this issue are recommended.

The purpose of the nursing field is focused on evaluating the patient's discomfort and implementing the necessary interventions to relieve it.⁶ A prolonged fasting time has a negative impact on com-

fort.^{18,22} In this study, very weak, albeit positive, correlation was found between the total duration of fasting for solids and the physical, social, and relief scores for the GCQ. In particular, mouth dryness exhibited positive correlation with many domains and levels of the GCQ, as well as with the trait anxiety score. Giving clear carbohydrate-rich drinks before surgery increases the patient's comfort level by reducing hunger and thirst sensations.^{17,19} Based on these findings, we can assume that an individual's physiological needs affect anxiety and comfort. Nurses need to know current preoperative fasting recommendations that could affect satisfaction with the surgical experience.¹⁸ The implementation of evidence-based information on the fasting duration before surgery in collaboration with surgical nurses and surgical team will have a positive impact on patients' comfort.⁴⁰

In this study, the state and trait anxiety scores of the pregnant women before undergoing cesarean section were found to be negatively correlated with most domains and levels of the GCQ. The level of anxiety experienced by an individual also affects the level of comfort.¹³ Therefore, attempts to reduce an individual's anxiety will also increase the comfort level.

A few prior studies have investigated the relationship between the duration of fasting and maternal blood glucose levels. In the present study, the peripheral blood glucose values were found to be lower in some pregnant women. In addition, weak negative correlation was identified between the duration of fasting in relation to solids and the peripheral blood glucose levels in pregnant woman. When the fasting period is prolonged, the plasma glucose levels gradually decrease.⁴¹ Furthermore, prolonged fasting may lead to hypoglycemia, dehydration, ketoacidosis, delayed recovery, and reduced patient satisfaction.³⁴ In a previous study, there was no significant relationship between fasting time and blood glucose level in general surgery patients.¹⁸ In another study,⁴⁰ no statistically significant difference was found between the preoperative oral carbohydrate solution administration and control groups in terms of glucose level in the preoperative period. However, anxiety was significantly

lower in the oral carbohydrate solution group, and the scores for relief, relaxation, and transcendence were significantly higher than those of the control group in elective laparoscopic cholecystectomy.⁴⁰ As a result, preoperative anxiety and fasting affect the comfort of the woman. In elective cesarean section, randomized controlled trials are needed to increase the comfort of the woman before surgery.

Conclusion

Comfort is an important part of nursing care. The preoperative process negatively affects the comfort levels of pregnant women. The sensations of thirst and mouth dryness that stem from the prolongation of the preoperative fasting period also cause discomfort to pregnant women. It may be useful for nurses to evaluate anxiety

levels of patients before surgery. Reducing the level of anxiety and shortening the duration of fasting before cesarean section should hence increase the comfort levels of pregnant women. Traditional practices related to fasting time should be reviewed, and new protocols should be established. The preoperative fasting policy should clearly address the recommended fasting time for liquid and solid. Thus, patients and staff need training for the importance and benefits of fasting instructions. Nurses can help to determine the interventions that will increase their patients' comfort before surgery, which should contribute positively to the speed of patients' recoveries.

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