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Preoperative anxiety among Iranian adult patients undergoing elective surgeries in educational hospitals

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Abstract:

BACKGROUND: Although surgical techniques have been improving, preoperative anxiety is still a challenge in preoperative care and is known as an expected response experienced by patients waiting to undergo surgery. The present study aimed to compare preoperative anxiety levels in three educational hospitals in Kerman.

MATERIALS AND METHODS: This cross-sectional study was conducted in three educational hospitals in Kerman, Iran, from December 2017 to May 2018. The participants were 100 patients from each hospital (300 patients in sum) who were selected through the convenience sampling method. Sampling was not restricted to sex and type of surgery. The 40-item Spielberger State-Trait Anxiety Inventory was administered to the patients to assess the level of preoperative anxiety experienced by them. Bivariate linear regression models were used to compare the preoperative state anxiety levels based on the patients' demographic information. A multivariate linear regression model was used to determine the predictors of preoperative state anxiety.

RESULTS: The participants were 149 males and 151 females with a mean age of 36.38 (12.75) years (age range: 12–79 years). Almost two-third of the patients showed upper-middle symptoms of state anxiety ($n = 197$, 65.7%) followed by upper-middle symptoms of trait anxiety (40% and 49.3%, respectively). There was a significant relationship between the patient's sex and state anxiety ($P = 0.05$) and also between trait anxiety and state anxiety ($P \leq 0.001$). It was shown that train anxiety could predict state anxiety before surgery (B: 0.53, 95% confidence interval: 0.44, 0.62; $P \leq 0.001$).

CONCLUSION: The results of the present study confirmed the presence of preoperative anxiety in a sample of Iranian patients. Although the anxiety scores were not very high, organizing intervention and training programs to control and reduce preoperative anxiety among patients seems essential.

KEYWORDS:

Educational hospitals, Iran, predictors, preoperative anxiety, surgery

Introduction

Anxiety is described as an uneasy feeling with a nonspecific and unknown source that can cause abnormal hemodynamics. The World Health Organization reported that about 20% of adolescents experience mental disorders mainly anxiety and depression.^[1] Anxiety disorders were reported to be 6.8%–86% in Iranian children

and adolescents.^[2] Anxiety may occur due to several reasons including the presence in hospitals and health-care centers even for healthy people, fear of illness, hospitalization, anesthesia, or surgery. Besides, prolonged anxiety may lead to stress and delay in the patient's recovery.^[3-7] Approximately 47% of patients in Iran reported preoperative anxiety.^[8]

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Although surgical techniques have improved, preoperative anxiety is still a challenge in preoperative care and is known as an expected response experienced by patients waiting for surgery. Besides, 50% of patients experience anxiety before surgery. Studies showed that several factors might account for preoperative anxiety. Some factors elevate preoperative anxiety such as female sex, smoking habits, a history of mental disorders, and fear of postoperative pain.^[8,9] According to previous studies, females and those people who have never had surgery were more anxious. Besides, fear of surgical complications and outcomes was the most common factor responsible for preoperative anxiety.^[9,10] In contrast, having a previous history of surgery, types of anesthesia, surgery, and postoperative pain, and also the patient's level of education may reduce preoperative anxiety.^[10]

Other important factors affecting preoperative anxiety are the type of hospital and hospital facilities. In fact, hospital equipment and facilities, treatment methods and services, the ability and expertise of physicians, the number of hospital staff and their skills, the presence of required diagnostic services, the presence of students, the high density of clients and hospitalized patients, the incidence and prevalence of infectious diseases, and the observance of safety and health issues in educational hospitals can affect patients' stress and anxiety.^[11]

Therefore, since the prevalence of preoperative anxiety seems to be high among patients and it leads to several complications for them during and after surgery and also as preoperative anxiety can affect patients' recovery, necessary actions such as preoperative nursing care and educational plans need to be taken to improve patients' attitudes and reduce their anxiety before, during, and after surgery.^[12] Besides, the determinants of preoperative anxiety must be further assessed among patients who need to undergo surgery in educational hospitals. Given the importance of this issue and the paucity of research in this field in Iran, the present study aimed to explore preoperative anxiety in patients referring to three educational hospitals in Kerman.

Materials and Methods

This cross-sectional study was conducted in three general educational hospitals of Kerman from December 2018 to May 2019. Kerman is the capital of the largest province of Iran and is located in the southeast of the country. The participants were 300 patients from the hospitals (100 patients from each hospital) selected through the convenience sampling method. Sampling was not restricted to sex and type of surgery. All patients aged 18 years or older were candidates for elective surgery. The patients with mental disabilities and those

who had an anxiety disorder or used anxiolytic drugs were excluded from the study.

There are three educational hospitals in Kerman including Afzalipour, Shafa, and Shahid Bahonar. All abdominal, pelvic, cesarean, and gynecological surgeries are performed in Afzalipour Hospital. Patients refer to Shafa Hospital for eye surgery, ear, nose, and throat surgery, heart surgery, and orthopedic surgery on arms and shoulders. Other orthopedic surgeries, urology surgery, and neurosurgery are performed in Shahid Bahonar Hospital.

Spielberger State-Trait Anxiety Inventory (STAI) was administered to the patients to assess the level of preoperative anxiety. The inventory had been validated for use in Iran.^[13,14] All questionnaires were completed in the waiting room by the patients 1 h before surgery. The first author trained the patients on how to answer the questions and if a patient was illiterate, the questionnaire was completed for him/her by the first author.

The STAI is a 40-item instrument. The first 20 items evaluate state anxiety (S-Anxiety) and the remaining 20 items measure the trait anxiety (T-Anxiety). The items in the S-Anxiety scale assess the intensity of current feelings "at this moment:" (1) not at all, (2) somewhat, (3) moderately so, and (4) very much so. The items in the T-Anxiety scale measures the frequency of feelings "in general:" (1) rarely, (2) sometimes, (3) often, and (4) almost always. In the state portion of STAI (Y-1), anxiety is measured by ten items (items 3, 4, 6, 7, 9, 12, 13, 14, 17, and 18), while the remaining 10 items (1, 2, 5, 8, 10, 11, 15, 16, 19, and 20) assess the relaxed and pleasant state of the patient. A rating of 4 indicates the presence of a high level of anxiety for ten S-Anxiety items and a high rating indicates the absence of anxiety measured via the remaining ten S-Anxiety items. The scoring weights for the anxiety absent items are reversed. The scores of STAI range from a minimum of 20 to a maximum score of 80. Table 1 shows the categories of anxiety scores in both state and trait subscales:

The collected data were described using mean (standard deviation [SD]) and frequency at a 95% confidence interval (CI). Bivariate linear regression

Table 1: The score ranges of state and trait anxiety

Symptoms	State anxiety	Trait anxiety
Mild	20-31	20-31
Lower middle	32-42	32-42
Upper middle	43-53	43-52
Relatively severe	54-64	53-62
Severe	65-75	63-72
Very severe	≥ 76	≥ 73

models were used to compare the preoperative state anxiety levels in terms of age, sex, educational level, occupation, the history of operation, and trait anxiety. A multivariate linear regression model was used to determine the predictors of preoperative state anxiety, and the variables with $P < 0.20$ in bivariate linear regression models were entered in the multivariate linear regression model. The two-tailed P value for significance was established at 0.05. The data were analyzed using the Statistical Package for the Social Sciences version 23.

The protocol of the present study was reviewed and approved by the Ethics Committee of Kerman University of Medical Sciences (ethics number: IR.KMU.AH.REC.1397.156). Verbal informed consent was obtained from the patients before participating in the study.

Results

The participants were 149 males and 151 females with a mean age of 36.38 (12.75) years (age range: 12–79 years). Table 2 presents the demographic characteristics of patients:

As can be seen, 19% of the patients ($n = 57$) had a college education. Almost half of the patients ($n = 148$, 49.3%) were self-employed. Besides, more than half of the patients ($n = 170$, 56.7%) reported no history of surgery [Table 2].

The mean (SD) scores of state and trait anxiety experienced by the patients were 48.65 (6.12) and 50.29 (6.40), respectively. The range of the scores for state anxiety was 26 to 70 and for trait anxiety was 29 to 64. The findings of the present study showed that the majority of patients suffered from both state and trait anxiety [Figure 1].

Almost two-third of the patients were suffering upper-middle symptoms of state anxiety ($n = 197$, 65.7%) followed by upper-middle symptoms of trait anxiety (40% and 49.3%, respectively) [Figure 1]. Table 3 shows preoperative state anxiety symptoms among the patients.

As shown in the table above, almost half of the patients felt moderate calm ($n = 133$, 44.3%), steady (143, 47.7%), and content ($n = 136$, 45.3%) before surgery [Table 3].

The bivariate linear regression models showed that the patients' sex ($P = 0.05$) and trait anxiety ($P \leq 0.001$) had significant correlations with state anxiety. Table 4 presents the predictors of preoperative state anxiety for the patients.

As can be seen, the females experienced a higher level of state anxiety compared to the male participants (B: 1.33, 95% CI: -0.05, 2.71). Besides, one unit increase in

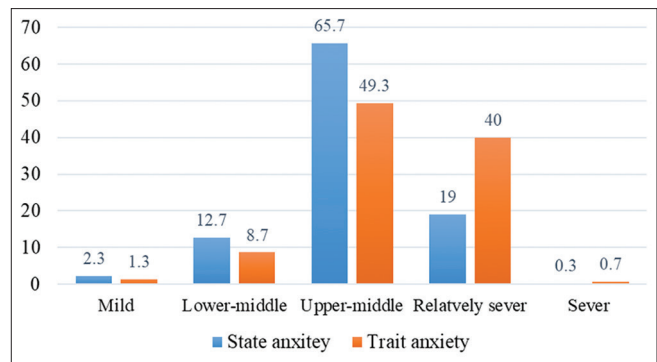


Figure 1: Distribution of anxiety symptoms among the patients

Table 2: The participants' demographic characteristics

Variable	Categories	Frequency (%)
Age groups	<20	18 (6)
	20-40	178 (59.3)
	≥40	104 (34.7)
Sex	Male	149 (49.7)
	Female	151 (50.3)
Educational level	Illiterate and primary school	95 (31.7)
	High school and diploma	148 (49.3)
	Higher than diploma	57 (19)
Occupation	Clerk officer	92 (30.7)
	Self-employed	126 (42)
	Unemployed	82 (27.3)
History of surgery	No	170 (56.7)
	Yes	130 (43.3)

trait anxiety increased state anxiety by 0.53 (B: 0.53, 95% CI: 0.44, 0.62). The multivariate model showed that only trait anxiety predicted the state anxiety before surgery (B: 0.53, 95% CI: 0.44, 0.62; $P \leq 0.001$) [Table 4].

Discussion

The results of the present study showed that preoperative anxiety was prevalent among the patients in surgical wards and the majority of patients suffered from both state and trait anxieties. Concerning the severity of state anxiety, almost half of the patients felt moderate calm, steady, and content before surgery. However, the upper-middle symptoms were prevalent among the patients for both state and trait anxieties. The male and female patients also showed significant differences in terms of state anxiety. Nevertheless, only trait anxiety was found to be a predictor of preoperative state anxiety.

This study also found that the majority of patients suffered from state and trait anxiety, as was evident in previous studies.^[15,16] Although the level of anxiety in these two studies was different from the present study, it was not high and all of these studies indicated a relatively high level of preoperative anxiety in the participants. In the present study, almost two-third of patients reported upper-middle symptoms of state anxiety. Besides, less

Table 3: Preoperative state anxiety symptoms

Variables	Not at all, n (%)	Somewhat, n (%)	Moderately so, n (%)	Very much so, n (%)
I feel calm	44 (14.7)	86 (28.7)	133 (44.3)	37 (12.3)
I feel secure	34 (11.3)	118 (39.3)	89 (29.7)	59 (19.7)
I feel tense	45 (15)	131 (43.7)	78 (26)	46 (15.3)
I feel strained	47 (15.4)	107 (35.7)	108 (36)	38 (12.7)
I feel at ease	38 (12.7)	91 (30.3)	124 (41.3)	47 (15.7)
I feel upset	53 (17.7)	116 (38.7)	99 (33)	32 (10.7)
I am presently worried	50 (16.7)	131 (43.7)	82 (27.3)	37 (12.3)
I feel satisfied	45 (15)	90 (30)	113 (37.7)	52 (17.3)
I feel frightened	56 (18.7)	96 (32)	93 (31)	55 (18.3)
I feel comfortable	43 (14.3)	96 (32)	110 (36.7)	51 (17)
I feel self-confident	52 (17.3)	101 (33.7)	99 (33)	48 (16)
I feel nervous	42 (14)	121 (40.3)	78 (26)	59 (19.7)
I feel jittery	41 (13.7)	103 (34.3)	119 (39.7)	37 (12.3)
I feel indecisive	52 (17.3)	96 (32)	107 (35.7)	45 (15)
I am relaxed	48 (16)	107 (35.7)	106 (35.3)	39 (13)
I feel content	28 (9.3)	95 (31.7)	136 (45.3)	41 (13.7)
I am worried	66 (22)	114 (38)	77 (25.7)	43 (14.3)
I feel confused	58 (19.3)	94 (31.3)	95 (31.7)	53 (17.7)
I feel steady	31 (10.3)	77 (25.7)	143 (47.7)	49 (16.3)
I feel pleasant	29 (9.7)	113 (37.7)	104 (34.7)	54 (18)

Table 4: Predictors of preoperative state anxiety

Variables	Categories	Crude B* (95% CI)	P	Adjusted B* (95%CI)	P
Age groups	<20	-1.71 (-4.77-.35)	0.27	-	-
	20-40	0.92 (-0.55-2.4)	0.22	-	-
	≥40	Reference	-	-	-
Sex	Male	Reference	-	Reference	-
	Female	1.33 (-0.05, 2.71)	0.05**	0.61 (-0.55-1.78)	0.30
Educational level	Illiterate and primary school	1.79 (-0.2-3.8)	0.07	1.08 (-0.58-2.75)	0.20
	High school and diploma	0 (-1.88-0.86)	1	-0.44 (-2.01-1.12)	0.57
	Higher than diploma	Reference	-	Reference	-
Occupation	Office clerk	Reference	-	Reference	-
	Self-employed	0.72 (-0.93-2.37)	0.39	-	-
	Unemployed	0.53 (-1.29-2.37)	0.56	-	-
History of surgery	No	Reference	-	-	-
	Yes	-0.45 (-1.85-0.95)	0.52	-	-
Trait anxiety		0.53 (0.44-0.62)	≤0.001**	0.53 (0.44-0.62)	≤0.001**

*Univariate and multivariate linear regression models, ** $P \leq 0.05$. CI=Confidence interval

than half of the participants experienced relatively severe state anxiety and trait anxiety symptoms. On the other hand, severe trait anxiety symptoms were more commonly reported by the patients in the present study. In contrast, Kim *et al.* showed that over 50% of Korean patients had higher state anxiety and trait anxiety scores.^[16] This difference could be due to the study population, preoperative education, and type of hospitals.

Regardless of the type of anxiety, patients with higher levels of anxiety need a higher dose of medication for anesthesia.^[17] Therefore, it is critical to reduce the anxiety level of the patients through nonpharmaceutical interventions. There is plenty of evidence in the literature demonstrating the crucial role of preoperative

information in diminishing perioperative anxiety.^[18-20] When nurses or anesthesiologists face patients with high anxiety, they should use audiovisuals, psychoeducational information, and preoperative nursing visits to reduce their anxiety.^[21] These interventions have been shown to reduce anxiety by delivering supplementary information to the patients.^[18]

Based on the results of the present study, the female patients experienced higher levels of state anxiety, and there was a significant relationship between sex and state anxiety. Kim *et al.* in Korea showed that although females had a higher mean STAI score, there was no significant gender difference.^[16] Mavridou *et al.* showed that Greek females were significantly more afraid of anesthesia than men.^[22] Meanwhile, Rodrigues *et al.* reported an

association between preoperative anxiety and gender among Brazilian patients.^[23] Similarly, other studies showed a higher prevalence rate of anxiety disorders in females than in males,^[24] which could be attributed to hormonal differences.^[25]

According to the patients' reports, the previous surgical experience or information about surgery^[26] and educational levels^[27] can account for the severity of preoperative anxiety. However, the multivariate model showed that only trait anxiety predicted state anxiety before surgery. Meanwhile, Nigussie *et al.* study showed that trait anxiety was one of the predictors of preoperative anxiety. However, the previous surgery and educational level showed no significant correlation with preoperative anxiety among Ethiopian patients.^[15]

In the current study, feeling moderate steady, content, and calm were associated with preoperative state anxiety reported by the patients. Moreover, a study by Nigussie *et al.* on state anxiety showed that about half of Ethiopian patients felt very much satisfied, relaxed, and content.^[15] On the other hand, the evidence showed a significant level of preoperative anxiety among patients who lacked preoperative information.^[28] It has been also shown that more attention from medical staff and their active involvement in hospitalization such as patients' preoperative training and psychological support could reduce patients' anxiety and its impacts.^[29,30] Besides, it was shown that educational programs could prevent or reduce stress, especially among the elderly.^[31]

Although hospitals are places where patients go to regain health, many complications and deaths also occur there. Thus, patients' thoughts and anxieties reflect their concerns about these complications and unfavorable consequences of the treatment process.^[32] Preoperative stress and anxiety are related to surgical outcomes, and thus paying attention to them can have a positive effect on patients' recovery. To deal with anxiety, appropriate corrective and intervention measures can be designed and implemented by health-care organizations by taking into account the patient education process and patient's preferences.^[30]

This study was conducted in three educational hospitals and the physicians were directly in contact with the patients for data collection. One of the limitations of the present study was that assessing anxiety using a questionnaire does not provide much reliable data because questionnaires are not objective instruments for data collection and patients might not respond accurately to the items in the questionnaire. In addition, this study only focused only on the patients' preoperative anxiety.

Conclusions

When patients first learn they have acute or chronic diseases, they often react with anxiety and fear. They fear unknown outcomes of the disease, the hospital environment, and the process associated with their diagnosis. Besides, patients' efforts to deal with these issues might increase and magnify their fears and anxieties about death. The results of the present study confirmed the presence of preoperative anxiety in a sample of Iranian patients. Although the anxiety scores were not very high, organizing intervention and training programs is essential to control and reduce preoperative anxiety among patients. Besides, improving preoperational clinics to educate patients about anesthesia and surgery can contribute to reducing anxiety experienced by patients and their families. Further studies are also needed to investigate the effect of educational interventions on controlling and reducing preoperative anxiety and its related factors in other populations.

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Conflicts of interest

There are no conflicts of interest.

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