

Anxiety in the Operating Room Before Elective Surgery

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Abstract- The experience of pre-operative anxiety in patients is a common and accepted issue; however, anxiety can potentially increase the patients' need for care, the level of post-operative pain, and ultimately patients' morbidity and mortality. The goal of this study was to determine the patients' pre-operative anxiety level right before they undergo surgery in the operating room. This study was conducted as a prospective cross-sectional study. Accordingly, completed State-Trait Anxiety Inventory questionnaires as well as demographic and contextual variables of 230 patients undergoing surgery were evaluated. Data analysis was taken out using SPSS v24. *P* of less than 0.05 was considered significant. 230 patients with an average age of 48.95 (14.68) years were enrolled. The frequency of mild, moderate, and severe anxiety among the patients was 50.8%, 37%, and 12.2%, respectively. The analysis revealed that the patients' age, gender, occupation, awareness about the type of anesthesia, and place of residence, as well as the type of anesthesia, had no significant correlation with the patients' pre-operative anxiety. However, a significant difference was found regarding patients' pre-operative anxiety level and their educational, marital, awareness of post-operative complications, and trait anxiety status as well as their history of anesthesia. Therefore, to reduce post-operative complications, it is recommended that the patients with these characteristics be given priority for interventions aimed at reducing pre-operative anxiety.

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Introduction

Pre-operative anxiety is one of the most common problems in patients undergoing surgery and often described as an unpleasant feeling of tension and insecurity that is originated from patients' doubts or fears about the surgery. This fear is probably secondary to illness, admission to hospital, and scheduled anesthesia and surgery for the patient (1). Some strong pieces of evidence suggest that pre-operative anxiety is significantly related to post-operative pain. Anxiety can reduce the patient's full participation in pre-operative planning and education, induce physiological manifestations, impede the expected patient's recovery, and even increase mortality and morbidity (2,3).

However, the experience of stress and anxiety on the body has been accepted as a normal response in pre-operative patients (4). This anxiety is possibly due to the expectation of post-operative pain, separation from the family, loss of personal independence, and fear of death (5). Accordingly, there is growing attention to the possible effects of pre-operative stress on the outcome of

the surgery. The previous studies have shown that the anxiety level that the patients experience pre-operatively can alter their response to anesthesia and analgesia (6,7). Besides, anxiety may increase the level of post-operative pain, cause depression, nausea, and fatigue, interfere with wound healing, increase the need for post-operative analgesics (2), and ultimately result in delayed discharge from the hospital (8).

According to previous studies, it has been demonstrated that the level of pre-operative anxiety was higher in particular groups, namely women, patients undergoing surgery for the first time, and younger patients (7,9-12). Furthermore, the level of education, type of surgery, and hospitalization experience can also be related to the anxiety level experienced by the patients (13). Arranged measures for reducing the anxiety included: medication, providing adequate information to the patients, distracting their attention, mindfulness, and relaxation (14).

The goal of this study was to determine the level of anxiety experienced by the patients using the valid version of the State-Trait Anxiety Inventory Scale (STAI)

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Pre-operative anxiety in the OR

questionnaire, minutes before they undergo surgery in the operating room.

Materials and Methods

This study was designed as a prospective cross-sectional study. After the approval by the ethical committee (IR.TUMS.IKHC.REC.1398.069), the study was carried out on a sample size of 230 patients undergoing surgery. The sampling for this study was done using the convenient sampling technique. Inclusion criteria consisted of patients aged 18 or more years undergoing surgery and an adequate comprehension of Farsi (Persian) language. Exclusion criteria included patients undergoing non-elective surgery, patients with gross cognitive or consciousness impairment, patients with a history of known psychological disorder, patients with a history of using tranquilizers or drug addiction, and an unwillingness to continue taking part in the study. There were no limitations for patients enrolled in the study regarding the type of surgery or the route and type of anesthesia. Written informed consent was obtained from all the patients meeting the inclusion criteria before being enrolled in the study. The study was conducted according to the declaration of Helsinki.

After recording participants' demographic data, occupation, educational status, history of previous anesthesia and surgeries, and awareness status about the type of anesthesia and post-operative complications, they were asked to complete the standard Spielberger State-Trait Anxiety questionnaire (Farsi translated version).

The State-Trait Anxiety Inventory questionnaire was developed by Charles Spielberger in 1983. This questionnaire consists of two sections, evaluating the trait and state of anxiety using 20 questions in each part. The least obtainable score is 20, meaning no present anxiety, and the maximum score is 80, meaning the highest level of anxiety. Spielberger's questionnaire was translated to Farsi (Persian) in 1994 with acceptable validity and reliability (Cronbach's alpha coefficient >0.94). Data analysis of completed questionnaires was used to estimate the patients' anxiety levels when entering the operation room. Scores within the range of 21-39, 40-59, and 60-79 were considered as mild, moderate, and severe anxiety levels, respectively.

Gathered data were analyzed using IBM SPSS version 24.0 by utilizing Kolmogorov-Smirnov, Pearson Chi-Square, and Fisher's Exact tests. A smaller *P* than 0.05

was considered as significant.

Results

In this study, 230 patients were consecutively evaluated, of whom 138 patients (60%) were female. Patients' age ranged from 18 to 84 years. The mean age of the participants was 48.95 (14.68). 18 (7.8%) patients had healthcare-related occupations, 122 (53%) patients were engaged in occupations unrelated to the health care system, and 90 patients (39.2%) were unemployed. 35 (15.2%) of our study population were illiterate, 62 (27%) had an educational status within elementary levels, 92 (40%) had secondary levels of education, and 41 (17.8%) had academic degrees. Our study population consisted of 30 (13%) single patients, 170 (73.9%) married, and 30 (13%) divorced or widowed patients. 179 (77.8%) of our patients resided in urban areas, and 51 (22.2%) resided in rural areas. Among the patients, 122 patients (53%) had the experience of prior anesthesia, and 108 patients (47%) were about to experience anesthesia for the first time. Regarding the patients' awareness about the surgery and the type of anesthesia, 195 (84.7%) patients reported little or no knowledge, and 35 (15.2%) patients considered their information sufficient or excessive. In addition, regarding the awareness about post-operative complications, 193 (84%) patients considered themselves uninformed or poorly informed, and 37 (16%) patients reported themselves as adequately or excessively informed. 193 (83.9%) patients were about to undergo general anesthesia while 37 (16%) patients were about to undergo local anesthesia.

According to the State Anxiety section of the completed Spielberger questionnaires, the frequency of patients with mild, moderate, and severe anxiety was 117 (50.8%), 85 (37%), and 28 (12.2%), respectively. Assessing the Trait anxiety status, 129 patients (56.1%) had mild anxiety, 85 patients (37%) had moderate anxiety, and 16 patients (7%) had severe anxiety.

The association between state anxiety of patients with different variables is demonstrated in Table 1. Statistical analysis revealed that there was a significant difference in the state anxiety level between different groups of patients with regards to their education level ($P<0.001$), marital status ($P<0.001$), anesthesia history ($P=0.029$), awareness about post-operative complications ($P=0.002$), and trait anxiety level (T-STAI) ($P<0.001$).

Table 1. Pre-operative anxiety (S-STAI) of the study population divided by the patients' characteristics

Groups	S-STAI score			P
	Low	Moderate	High	
Age mean (SD)	48.68 (14.89)	49.50 (14.72)	48.39 (14.14)	0.927
Gender n (%)				0.189
	female	54 (39.1)	20 (14.5)	
	male	31 (33.7)	8 (8.7)	
Occupation n (%)				0.277
	Healthcare	6 (33.3)	5 (28.7)	
	Non-Healthcare	51 (41)	9 (11)	
	Unemployed	29 (32.2)	12 (13.3)	
	Illiterate	3 (8.6)	5 (14.3)	
Education n (%)				<0.001
	Elementary	23 (37.1)	4 (6.5)	
	Secondary	33 (35.9)	17 (18.5)	
	Academic	26 (63.4)	2 (4.9)	
	Single	18 (60)	7 (23.3)	
Marital Status n (%)				<0.001
	Married	56 (32.9)	15 (8.8)	
	Divorced/ widowed	11 (36.7)	6 (20)	
Residency n (%)				0.792
	Rural	17 (33.3)	6 (11.8)	
	Urban	68 (38)	22(12.3)	
History of anesthesia n (%)				0.029
	Positive	39 (32)	21 (17.2)	
	Negative	46 (42.6)	7 (6.5)	
Awareness-type of anesthesia n (%)				0.0911
	No/Little	67 (34.4)	23 (11.8)	
	Adequate/ excessive	12 (34.3)	18 (51.4)	
Awareness-postoperative complications n (%)				0.002
	No/little	62 (32.1)	24 (12.4)	
	Adequate/ excessive	10 (27)	23 (62.2)	
Level of trait anxiety (T-STAI) n (%)				<0.001
	Mild	117 (90.7)	12 (9.3)	
	Moderate	0 (0)	73 (85.9)	
	Severe	0 (0)	0 (0)	
Type of anesthesia n (%)				0.567
	General	69 (35.8)	25 (13)	
	Local	18 (48.6)	3 (8.1)	

Discussion

Pre-operative anxiety, as an unpleasant feeling of fear and uncertainty about the outcome, may worsen the outcome of the operation or even cause patients' avoidance from the operation. Regarding the nature of surgical procedures, it is an accepted phenomenon to have pre-operative anxiety. Many patients experience it while waiting for elective surgeries as well. While various methods have been introduced to measure pre-operative anxiety in patients, in this study, we used STAI as one of the most common evaluation criteria.

Findings from this study have shown that nearly half of the studied patients (50.9%) experienced mild anxiety (S-STAI between 21 and 39), and only 12.2% of patients experienced severe anxiety (S-STAI between 41 and 59). In another study conducted in Iran, mean S-STAI in patients was reported as 56 (15). Jafar *et al.*, reported high levels of anxiety (S-STAI of 44 or higher) in most patients (62%) in Pakistan (16). In a study of 344 patients in the Czech Republic, Homozova *et al.*, reported the patients' anxiety prevalence rate of 30.2% (17). Caumo *et al.*, in

Brazil, reported that 23.99% of patients have suffered from high levels of pre-operative anxiety (18). Apart from geographical and cultural issues, one of the most important causes of differences in the reported level of anxiety in patients may have been the difference in the methods of studies. For example, in some studies, patients with specific surgeries have been excluded. In the study by Caumo *et al.*, patients with cardiac and ophthalmologic surgeries were excluded from the study (18). Jafar *et al.*, excluded the patients with cardiac, major vascular, malignancy-related, and extensive bowel excision surgeries from their study (16). In the study by Homozova *et al.*, excluding certain types of surgeries were not mentioned (17). Therefore, to obtain a precise estimate of the prevalence of anxiety in studies, it is necessary to use the same methods in patients' evaluations.

According to the findings of this study, patients with less education experience less pre-operative anxiety. Similarly, some previous studies reported higher anxiety in more educated individuals (2,16,18,19). This would probably be because more educated people are more

Pre-operative anxiety in the OR

aware of the risks and complications associated with anesthesia and surgery. This hypothesis is also supported by a study by Pokharel *et al.*, that concluded more educated people need to obtain more information about their surgery (20). In our study, in addition to higher education, patients who were more aware of post-operative complications were more likely to have moderate anxiety than mild anxiety.

Some studies have noted the previous negative history of surgery as a risk factor for a significant increase in patients' pre-operative anxiety (13,16-18,21). However, there was no significant association between prior history of anesthesia and the pre-operative anxiety level in our study. Besides, we found that married patients were more likely to experience mild anxiety levels. This issue has been studied previously in the study of Karanci *et al.*, but no significant relationship has been found between marital status and anxiety level (13).

Although this study did not find a link between the level of experienced anxiety and the gender of patients, several studies have reported the female gender as a risk factor for increased anxiety (2,13,16,18,20). Furthermore, Jafar *et al.*, have shown in their study that a younger age may be associated with higher pre-operative anxiety (16). However, in our study, similar to the study by Yilmaz *et al.*, (2), there was no significant relationship between the patients' age and the level of anxiety experienced. Also, Conceicao *et al.*, showed in their study of 145 patients that there was no significant difference in age between the two groups of patients with and without anxiety (22). The type of anesthesia and patients' awareness about it, place of residence, and occupation of patients were other evaluated parameters that were not correlated with pre-operative anxiety level in this study.

Another finding of this study was a significant relationship between patients' trait anxiety and their state anxiety. In this study, the Trait section of the STAI questionnaire was used to assess the trait anxiety level of patients, and it was concluded that the patients with severe trait anxiety experienced more severe state anxiety than the rest of the patients. On the other hand, patients with mild and moderate trait anxiety experienced mild and moderate state anxiety levels more than the other two groups of patients, respectively. In various studies, to reduce pre-operative anxiety, different interventions have been tried. Among these interventions are patients' information, continuous information, use of music, and the use of anti-anxiety drugs (9,23-25). Considering the association between pre-operative anxiety and increased morbidity, performing these interventions seems necessary.

Although the correlation between the state of anxiety and the type of anesthesia has been studied in this study and no significant differences, have been observed regarding the level of anxiety experienced by patients before surgery between the two groups (local vs. general anesthesia), one of the limitations to our study could be not specifying the type of surgery that the study population was preparing for. It is suggested that further studies designed with a focus on the correlation of the type of surgery and state of anxiety be conducted in order to obtain more precise results.

According to the findings of this study, to reduce the worries and anxiety of the patients, it is advisable to pay particular attention to single or more educated patients, as well as those who have higher trait anxiety levels. Actions taken in order to reduce anxiety levels in the mentioned groups of patients could prove beneficial in increasing the patients' satisfaction with their surgery experience as well as reduce the patients' hospital stay.

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