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# Anxiety in the Preoperative Period: Associated Risk Factors and General Health Condition

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## Abstract

Anxiety is defined as a terrible experience of fear, apprehension, tension and stress; it is one of the most common events that can happen to patients awaiting surgery. It has many psychological and physiological side effects. Despite the high prevalence rates of Preoperative anxiety in clinical practice, it is often under recognized and under managed clinical problem.

**Aim:** The aim of this study is to find out the extent of this type of anxiety with recognition of the factors and health status of patients that are involved in its emergence in the preoperative stage at Al Hussein Teaching Hospital and obstetric hospital in the city of Samawah, which is located in the center of Al-Muthanna Governorate, 270 km south of Baghdad.

**Method:** A cross-sectional study that started from October 2019 to March 2020 at Al Hussein Teaching Hospital and obstetric hospital, one hundred patients were randomly selected from patients awaiting surgery, and they have given their signature by agreeing to study them. The anxiety level was measured by the State and Trait Anxiety Inventory. Statistical analysis had been done using "SPSS" version 26, descriptive statistics and Binary logistic regression analysis "has been used to determine predictors of preoperative anxiety. Correlation strength was examined using OR with "95% confidence interval, P-value less than 0.05 were considered as statistically significant.

**Results:** Total of 100 patients (56 male and 44 female) who participated in the study, 67% of them had high pre-operative anxiety, which was more at the age of 60 years and above (OR=14.815, p-value = 0.012), high anxiety when there were no income (OR=3.007, p-value = 0.038) and there were current smoking (OR=3.310, p-value= 0.044). 71% of patients had Fear of postoperative pain, 67% had fear of complications after surgery, and 58% had fear of not regaining awareness after the end of anesthesia. These fears were leading sources of preoperative anxiety. After statistical analysis, the Preoperative anxiety was correlated significantly to many factors, such as:

- Fear of become permanently disabled (OR=12.990, p-value=0.000), fear of death (OR=12.267, p-value=0.000),
- Fear of not waking up after surgery (OR=5.811, p-value=0.000),
- Fear of complication (OR=5.138, p-value=0.000), Supra major surgery (OR=27.389, p-value=0.000),
- Fear of postoperative pain (OR=4.870, p-value=0.001), fear of medical errors (OR=3.348, p-value=0.007), fear of nothing orally after surgery (OR=3.220, p-value=0.01), fear of waking up in middle of the surgery (OR=3.154, p-value=0.008).
- Cancer (OR=8.453, p-value=0.008), no history of previous surgery (OR=0.123, p-value=0.00), previous hospitalization (OR=3.910, p-value=0.03), Preoperative pain (OR=3.910, p-value=0.003).

**Conclusion:** Preoperative anxiety was high in a sample of Iraqi patients. It is linked to several Sociodemographic factors such as: old age, low monthly income, smoking, and it is also linked to several factors that relate to the patient's evaluation of the severity of the risk he has to face, such as the possibility of disability or death. The general health situation and the grade of the surgery also determine the extent of the appearance of pre-operative anxiety. Patients need to be constantly evaluated about anxiety in the preoperative period and then find ways to reduce it.

**Keywords:** Anxiety; Preoperative Anxiety; Anxiety State-Trait; Anxiety Inventory

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## Introduction

We can define anxiety as a general feeling of fear, stress, anxiety, and discomfort? It appears as a response to many external and internal stimuli, and it appears as emotional, behavioral, physical, and cognitive

symptoms [1]. Before surgery, anxiety appears as a familiar response in many patients [2]. We can define preoperative anxiety as an anxious, uncomfortable mood with a general feeling of stress, which is an emotional response to event of surgery that carries a threat and a potential challenge [3], Surgery is still considered a difficult time



for humans and as a challenge to patients despite the technological advances made in this field, surgery adds additional restrictions before and after the event, such as changes in daily habits, as well as the weakness of the trans-operative period, which can lead to a high level of anxiety [4]. In the preoperative period, patients are vulnerable to psychological and physiological needs and are therefore prone to loss of emotional balance [5,6]. Anxiety is a personality trait for responding to specific situations with stress syndrome for responses. States of anxiety are then an indication of the situations they raise and the individual personality prone to stress [7]. All the characteristics of anxiety lead to mental deterioration, which is characterized by weak thinking, weakness in decision-making, harm to perception and lack of attention and focus [8,9]. There are many factors that exacerbate anxiety before surgery in the hospital, ranging from a realistic or imaginary threat to the process of dividing a person or something of human characteristics, often resulting from inhuman practices by health personnel, that can affect individuals in a variety of ways, especially when they create Imaginations before the surgical intervention, which may overlap in the context of the procedure and recovery, due to the fact that the emotional state of the patients affects the functioning of the immune system and their general physical condition [10].

The lack of information and guidance needed by the patient before surgery and the lack of support by the health staff, for example, the lack of an appropriate treatment relationship leads to a state of anxiety and depression throughout the hospital stay, generally the presence of information about surgery works to reduce anxiety before surgery [11]. This anxiety leads to many problems either before or after the surgery, such as preoperative nausea, vomiting, increased heart rate, high blood pressure, and many postoperative complications such as pain and infections [12-14]. Besides, it has been observed that a high level of preoperative anxiety is associated with increased consumption of pain medications for postoperative pain [15]. One of the factors that cause anxiety is the major changes in life, and surgery is one of these changes. We know that hospitalization, regardless of disease, is of concern to patients awaiting surgery. Those patients with a high level of anxiety need higher doses of anesthesia and are recovering poorly. If we do not diagnose this anxiety and the anxiety persists for a long time, it will harm the patient and delay healing [9-16]. The emergence or absence of anxiety in the preoperative period depends on many factors, such as the susceptibility of the patient to preoperative anxiety, age, gender, the presence of previous experience with surgery, level of education, type and extent of surgery, the patient's current health condition, The economic and social situation, knowing these factors provides the ground for the nursing staff to know the extent to which patients need psychological support during the preoperative period and thus they can reduce that anxiety, we must realize that some groups of patients have greater willingness to pre-operation anxiety, for example, females, younger patients, and those without previous experience of surgery [4-6,16]. Several studies examined the relationship between preoperative anxiety and morbidity/mortality. These studies have reached a conclusion, which is that preoperative anxiety is a sufficient predictor of the prevalence of morbidity and postoperative deaths, including late deaths, using survival analysis [8]. All of these conditions affect costs for patients, hospitals and countries. It also affects health care outcomes and patient satisfaction [9]. During our daily work we learned about a phenomenon called white coat hypertension, without a doubt it has a close relationship to anxiety and is considered a severe condition that has a serious health condition, as if uncontrolled it leads to glucose intolerance, damage to the body organs, heart diseases and even can lead to death [17]. And anxiety may be one of the factors that

lead to a decision to cancel the surgery? This cancellation would have been avoided if the causes that lead to anxiety were dealt with or focus was placed on fragile patients that are more likely to have pre-operative anxiety Studies have found that a large proportion of surgical patients have a significant level of preoperative anxiety (60-80%) in western population. but other studies have found a wider range, which is 11-80% [18,19].

## Results

Social and demographic specifications are summarized in table 1. This shows a total of one hundred patients awaiting surgery participated in this research. The number of female participants was 56 (56%), and most of the participants were aged 18-39 years. This study showed that 5 (5%), 83 (83%) and 7 (7%) were single, married, divorced and widowed, respectively. Fifty percent were primary graduates, 15% were illiterate, while 25% had finished their university education or institutes and only 10% had completed high school. Regarding the type of work, 5% were students, 13% were unemployed, and housewives accounted for 42%, 59% of the participants came from the villages. 75% of the patients did not smoke, and only 6% used alcohol. This table showed that 67% of patients who are waiting for surgery suffer from anxiety during the waiting period before the operation.

Table 2 shows that there is a relationship between age and the possibility of pre-operative anxiety, which was statistically significant, as the age of 60 and above was more prone to pre-operative anxiety about 14 times more than the age of 18-39 years, and there was

**Table 1:** Social and demographic specifications.

Variables		Anxiety state				Total	
		Low		High		No. %	
		No.	%	No.	%		
Anxiety		23	23%	67	67%	100	100%
Age	18-39	25	25 %	27	27%	52	52%
	40-49	5	5%	12	12%	17	17%
	50-59	2	2%	12	12%	14	14%
	More than 60	1	1%	16	16%	17	17%
Gender	Male	18	18%	26	26%	44	44%
	Female	15	15%	41	41%	56	56%
Marital status	Single	2	2%	3	3%	5	5%
	Married	29	29%	54	54%	83	83%
	Divorce	1	1%	4	4%	5	5%
	Widow	1	1%	6	6%	7	7%
Level of Education	Illiterate	3	3%	12	12%	15	15%
	Primary school	15	15%	35	35%	50	50%
	Secondary	4	4%	6	6%	10	10%
	Tertiary	11	11%	14	14%	25	25%
Occupation	Out of work	4	4%	9	9%	13	13%
	Worker	7	7%	7	7%	14	14%
	Student	4	4%	1	1%	5	5%
	Housewife	8	8%	34	34%	42	42%
	Government employee	8	8%	8	8%	16	16%
	Retired	2	2%	8	8%	10	10%
Residence	Urban	15	15%	26	26%	41	41%
	Rural	18	18%	41	41%	59	59%
Income	Low	10	10%	40	40%	50	50%
	Intermediate	12	12%	11	11%	23	23%
	High	11	11%	16	15%	27	27%
Current Smoking	Yes	4	4%	21	21%	25	25%
	No	29	29%	46	46%	75	75%
Regular use of Alcohol	Use	1	1%	5	5%	6	6%
	No use	32	32%	62	62%	94	94%



**Table 2:** Statistical analysis of Social and demographic specifications.

Socio Demographic Variables		Anxiety state		P value		Odd ratio
		Low	high	Value	s/ns	
Age	18-39	25	27			1
	40-49	5	12	0.183	NS	2.222
	50-59	2	12	0.035	S	5.556
	60 and more	1	16	0.012	S	14.815
Gender	Male	18	26	0.138	NS	*
	Female	15	41	-	-	
Marital status	Single	2	3	0.327	NS	*
	Married	29	54	0.289	NS	
	Divorce	1	4	0.794	NS	
	Widow	1	6	-	-	
Level of Education	Illiterate	3	12	0.132	NS	3.143
	Primary school	15	35	0.232	NS	1.833
	Secondary	4	6	0.829	NS	1.179
	Tertiary	11	14	-	-	1
Occupation	Out of work	4	9	0.562	NS	0.563
	Worker	7	7	0.146	NS	0.250
	Student	4	1	0.043	NS	0.063
	Housewife	8	34	0.945	NS	1.062
	Government employee	8	8	0.138	NS	0.250
	Retired	2	8	-	-	1
Residence	Urban	15	26	-	-	1
	Rural	18	41	1.314	NS	1.314
Income	Low	10	40	0.038	S	3.007
	Intermediate	12	11	0.491	NS	.672
	High	11	16	-	-	1
Current Smoking	Yes	4	21	0.044	S	3.310
	No	29	46	-	-	1
Regular use of Alcohol	Use	1	5	0.396	NS	2.581
	No use	32	62	-	-	1

also An important relationship between the financial level and the emergence of pre-operation anxiety, as patients with a low financial level experienced three times more pre-operation anxiety than patients with a high financial level, and smokers showed three times more likely to develop pre-operation anxiety than non-smokers, while Alcohol use did not appear to be associated with preoperative anxiety.

There are many possible causes for preoperative anxiety.

In this study, 71% of patients were afraid of postoperative pain, 67% fear complications that may appear after the operation, 58% are afraid of not restore awareness after the anesthesia has ended, 52% had a fear of waking up during anesthesia while the surgeon did not finish performing the operation, 51% are concerned about the family, similarly 51% showed fear of death. Generally the factors that are associated with preoperative anxiety are shown in Table 3.

Table 4 showed a statistically significant relationship between pre-operative anxiety and some factors, these factors include: fearof become permanently disabled, fear of death, fear of not waking up after surgery, fear of complication, and fear of postoperative pain. Fear of medical errors, fear of nothing orally after surgery, fear of waking up in middle of the surgery. While there were factors not statistically related to preoperative anxiety, including: fear of the effect of postoperative disability on monthly income, worried about the family, fear about the cosmetic appearance 76% of the patients participating in this study knew the type of operation and the diagnosis, but only 30% of the patients were informed about the anesthesia plan, although 86% of them were convinced of the amount of information they were told about the operation. 73% were suffering from pain before the operation.

**Table 3:** Factors associated with preoperative anxiety.

Variables		High anxiety		Low anxiety		Total	
		No.	%	No.	%	No.	%
Fear of postoperative pain	Yes	55	55%	16	16%	71	71%
	No	12	12%	17	17%	29	29%
Fear of complication	Yes	53	53%	14	14%	67	67%
	No	14	14%	19	19%	33	33%
Fear of not waking up after surgery	Yes	48	48%	10	10%	58	58%
	No	19	19%	23	23%	42	42%
Fear of medical mistakes	Yes	44	44%	12	12%	56	56%
	No	23	23%	21	21%	44	44%
Fear of waking up in the middle of surgery	Yes	41	41%	11	11%	52	52%
	No	26	26%	22	22%	48	48%
Worry about family	Yes	38	38%	13	13%	51	51%
	No	29	29%	20	20%	49	49%
Fear of death	Yes	46	46%	5	5%	51	51%
	No	21	21%	28	28%	49	49%
Fear of physical disability	Yes	43	43%	4	4%	47	47%
	No	24	24%	29	29%	53	53%
Fear of null by mouth during postoperative period	Yes	34	34%	8	8%	42	42%
	No	33	33%	25	25%	58	58%
Fear of decrease monthly income after surgery	Yes	24	24%	6	6%	30	30%
	No	43	43%	27	27%	70	70%
Cosmetic issues	Yes	18	18%	6	6%	24	24%
	No	49	49%	27	27%	76	76%

**Table 4:** Statistical analysis of relationship between risk factors and preoperative anxiety.

Associated factors		Anxiety state		P value		OR
		High	Low			
Fear of complication	Yes	53	14	0.000	S	5.138
	No	14	19			1
Worry about family	Yes	38	13	0.102	NS	*
	No	29	20			
Fear of postoperative pain	Yes	55	16	0.001	S	4.870
	No	12	17			1
Fear of death	Yes	46	5	0.000	S	12.267
	No	21	28			1
Fear of medical mistakes	Yes	44	12	0.007	S	3.348
	No	23	21			1
Fear of physical disability	Yes	43	4	0.000	S	12.990
	No	24	29			1
10 fear of decrease monthly income after surgery	Yes	24	6	0.063	NS	*
	No	43	27			
Fear of null by mouth during postoperative period	Yes	34	8	0.01	S	3.220
	No	33	25			1
Fear of waking up in the middle of surgery	Yes	41	11	0.008	S	3.154
	No	26	22			1
Fear of not waking up after surgery	Yes	48	10	0.000	S	5.811
	No	19	23			1
Cosmetic issues	Yes	18	6	0.331	NS	*
	No	49	27			

Patient health status is shown in table 5.

Table 6 showed a statistically significant relationship between Cancer and the emergence of pre-operative anxiety, as these patients experienced preoperative anxiety by more than eight times more than those who did not suffer from Cancer. Patients who had a history of previous surgery had less pre-operative anxiety than patients who



**Table 5:** Patient's health condition.

Variables		Anxiety state				
		Low		High		
		No.	%	No.	%	
Cancer	Yes	1	1%	14	14%	15
	No	32	32%	53	53%	85
Chronic diseases	Yes	4	4%	18	18%	22
	No	29	29%	49	49%	78
Psychiatric disorders history	Yes	5	5%	10	10%	15
	No	28	28%	57	57%	85
Previous admission	Yes	17	17%	54	54%	71
	No	16	16%	13	13%	29
Previous surgery under anesthesia	Yes	26	26%	21	21%	47
	No	7	7%	46	46%	53
Pre-operative pain	Yes	17	17%	54	54%	71
	No	16	16%	13	13%	29
Aware of anesthetic plan	Yes	12	12%	18	18%	30
	No	21	21%	49	49%	70
Knowledge about surgery and diagnosis.	Yes	27	27%	49	49%	76
	No	6	6%	18	18%	24
Satisfaction from discussed details of surgery	Yes	31	31%	55	55%	86
	No	2	2%	12	12%	14
Grade of surgery	Intermediate	17	17%	6	6%	23
	Major	13	13%	32	32%	45
	Supra major	3	3%	29	29%	32
Types of surgery	General surgery	19	19%	27	27%	46
	Urology	4	4%	6	6%	10
	Orthopedic	2	2%	8	8%	10
	Gynecology	7	7%	17	17%	24
	Oncologist	1	1%	9	9%	10

had the operation for the first time, this relationship was statistically significant. While patients who pre-operative pain had showed about four times more likely to develop preoperative anxiety

## Discussion

The prevalence of pre-operative anxiety in this study was 67% of patients, as these showed a high level of anxiety when they were evaluated by STAI; they scored above 44, which is the total point approved in this inventory to confirm the presence of a high level of anxiety. This result is similar to the result of the Pakistani study conducted on surgical patients, which showed a prevalence of 62 % [21], similarly, the result of the Indian study, which showed a prevalence of 58.9 % [22], and similar to the result of the Ethiopian study, which was 61% [23]. The result created by this study is higher than other studies conducted in many countries of the world such as Austria, Saudi Arabia and Nigeria, where the prevalence of pre-operative anxiety was 45.3%, 55% and 51% [24-26], respectively, perhaps the high prevalence rate In this study, because it was conducted in a city with a low economic level, as Al Muthanna Governorate is considered the poorest governorate in Iraq and most of the patients were of a low financial level, as well as they had a low educational level, which may play a role in not fully understanding the instructions that they were told about Anesthesia and surgical procedures to be performed. The prevalence of pre-operative anxiety in this study was lower than prevalence in other places in this world, such as Canada, Sri Lanka and

**Table 6:** Statistical analysis of health condition.

Health Status		Anxiety State		P value		OR
		High	Low			
		Cancer	Yes			
	No	53	32	1		
Chronic disease	Yes	18	4	0.082	NS	*
	No	49	29			
Psychiatric disorders history	Yes	10	5	0.976	NS	*
	No	57	28			
Previous admission	Yes	54	17	0.003	S	3.910
	No	13	16			1
Previous operation under anesthesia	Yes	21	26	0.000	S	.123
	No	46	7			1
Pre-operative pain	Yes	54	17	0.003	S	3.910
	No	13	16			1
Anesthesia plain	Yes	18	12	0.334	NS	*
	No	49	21			
Knowledge about surgery	Yes	49	27	0.331	NS	*
	No	18	6			
Satisfaction from discussed details of operation	Yes	55	31	0.088	NS	*
	No	12	2			
Grade of surgery	Intermediate	6	17	0.001	S	1
	Major	32	13			6.974
	Super major	29	3			27.389
Types of surgery				0.3	Ns	*
General surgery		27	19			*
Urology		6	4			*
Orthopedic		8	2			*
Gynecology		17	7			*
Oncologist		9	1			*

Nigeria, as prevalence was 89%, 76.7%, and 90%, respectively [27-29] perhaps due to strong family and social cohesion, also due to solid tribal support in this province, which is located in southern Iraq. Another explanation for this discrepancy in the prevalence of pre-operative anxiety between this study and those studies is that it may be due to the use of a different method to measure the degree of anxiety and perhaps to a different research methods, Likewise, because all the patients in this study are from the Islamic faith, and the study conducted in northwest Ethiopia showed that the pre-operative anxiety rate among Muslim patients was 45.2% less than Christian patients 62.6% [8]. This study showed an increase in the rate of pre-operative anxiety at the age of 60 years and more, and this result is different from the Turkish study [18] that showed that pre-operation anxiety decreases in old people and also does not correspond to many studies [24-30]. Perhaps the nature of life in Iraq makes patients with old ages feel hopeless with the knowledge that the average age in this country is less than 65 years at best, also due to the presence of co- morbidity. This study showed that there is no relationship between sex and pre-operative anxiety, this result was not consistent with many studies that showed that women are more likely to develop pre-operative anxiety [29-34], their result were due to women's sensitivity and due to hormonal differences, in our study we did not find this relationship because the type of operation that was performed to most women participating in this study is a caesarean section, and usually these women have previous experiences with this process and they are not



afraid of it, and it is considered a common surgery in this province and women prefer it to a natural birth. Despite this, there are studies that found that the pre-operative anxiety rate is equal in men and women [17-35]. Unlike other studies that showed a direct or inverse relationship between the higher educational level and pre-operative anxiety [17-36], our study did not show a relationship between the educational level and pre-operative anxiety, perhaps this is due to the fact that most participants in this study have a low educational level. Several studies have found a relationship between income and preoperative anxiety. A study conducted in Jemma, Ethiopia found that high-income patients experience anxiety more. The result is different in our study, low-income patients three times more than high-income patients to experience preoperative anxiety, perhaps the reason is that low-income patients are worried about losing their jobs due to a disability and that they did not store funds to support them in times of want, so they were more concerned. We found in this study that smokers are three times more likely to develop pre-operative anxiety and this gives the impression that smoking is linked to anxiety; this finding is supported by other studies [37,38]. We know that many mental disorders increase in smokers, such as anxiety disorders, depression and psychotic disorders. Several studies have shown that the use of alcohol reduces pre-operative anxiety [39]. In our study, we cannot determine this result because only six of the participants in this study use alcohol, so the result cannot be adopted based on this small number. There are many factors responsible for postoperative anxiety. In this study, fear of physical disability came first, as one of the factors that leads to the emergence of pre-operative anxiety, as it is a statistically important result? These patients showed about 13 times more preoperative anxiety, this result is not similar to the study conducted by Asres Beda so and Mohammed Ayalew in Ethiopia [23], as this factor came in seventh order and was not statistically significant, perhaps this factor came first in our study, as a result of the lack of full confidence in the surgeons working in this province, for this reason most patients prefer to perform surgeries in other regions, patients who prefer to perform the operation in this province are either poor or have no desire to spend additional money on the operations. In this study, fear of death came second, as patients who had fear of death showed pre-operative anxiety 12 more, and this does not coincide with the study conducted in Ethiopia, as it was ranked fourth [40] and not with another study, as it came first [17]. We think this is because of the lack of confidence in the surgeons working in these two hospitals, and perhaps because of the fear of anesthesia, and therefore death is the fate of the patient. The fear of unexpected results of the operation came third in this study, as a statistically significant result, this corresponds to the study conducted in Yirgalem zonal hospital in Ethiopia [23], and with the study conducted for Pakistani patients [31], we believe that fear of the results of the operation results from the fear of death and the fear of physical disability that may occur after the operation [31-34]. The fear of not waking up after the end of the operation came in the fourth order, and it carries high statistical significance, as these patients showed the ability to develop pre-operative anxiety five times more, and this result is consistent with what was stated in other studies [23,41]. Most patients who have a fear of not getting awake after the operation are due to concerns about anesthesia, due to what they hear from others or from the media, or because of lack of confidence in untested anesthetics in the Iraqi Ministry of Health laboratories. Fear of complications came fifth, this factor came second in the study that was conducted in Pakistan [31], and it was in the first rank in the studies that were previously conducted in Ethiopia [40] and Nigeria [26], although it came fifth in this study but it was a very important factor statistically, as these patients showed five times more preoperative anxiety. Post-

operative pain was statistically significant in relation to pre-operative anxiety and came sixth, while this factor came first in the check republic [32], second in Pakistan [31], third in the study conducted in northwestern Ethiopia [40], and fourth in the study conducted at Yirgalem General Hospital in Ethiopia [23]. Although the relationship of post-operative pain with pre-operative anxiety is statistically significant in this study, but it came in late order, perhaps because Iraqi patients have the ability to withstand pain as a result of the tragedies that have passed on them during the last forty years. Fear of medical errors came seventh, as these patients showed pre-operative anxiety about three times more, this result is not very different from what was found in the study that was found in Ethiopia [23], as these patients showed five times more anxiety. Also, this result is similar to the results of the study conducted in Addis Baba, as these patients showed pre-operative anxiety about two and a half times more [40]. Fear of the surgeon's mistakes remains a factor in the minds of patients, and this is what makes them prefer one surgeon over another to reduce these concerns. Awakening in the middle of the surgery came eighth in terms of statistical significance, as 41% of patients who had a fear of awakening in the middle of the surgery showed pre-operative anxiety and this corresponds to the study conducted on patients admitting to the anesthesia outpatient clinic for preoperative examination in Ahi Evran University's faculty of medicine. As this study showed that anxiety rates were higher in patients who suffer from fear of awakening in the middle of the surgery [42], while waking in the middle of the surgery was the least reason for pre-operation anxiety in another study, as it was found that 4.5% of patients who had pre-operative anxiety is due to the fear factor of awakening in the middle of the surgery, while fear of not being able to recover after the end of the operation is 53.9% of all pre-operative anxiety causes [40]. Factor for null by mouth came ninth in terms of statistical significance and this corresponds to the study conducted in a general hospital in Nigeria [26], as a small number of patients showed fear about null by mouth, and also came as a late factor in the study that was conducted in northwestern Ethiopia. Fear of lower monthly income after the operation did not show any significant relationship with pre-operation anxiety, perhaps because of the good family support for these patients. This study showed that cancer patients have pre-operative anxiety more than the rest of the patients, as these patients showed about eight times more pre-operative anxiety, and this corresponds to the study conducted on cohort of patients undergoing outpatient cancer surgery [43]. The study showed that there is no relationship between other chronic organic diseases and pre-operative anxiety. Perhaps the reason is that patients are preoccupied with surgery at the time more than they are preoccupied with their chronic disease. We did not find a study that examined this relationship. We did not find a relationship between previous mental illnesses and pre-operative anxiety. Perhaps we explain this result that a relatively large number of Iraqi patients have psychological problems, but they do not admit it either because they complain of physical symptoms that they do not attribute to mental illness, so they are not diagnosed as suffering from mental illness or they deny it because of the shame. The result of this study is not consistent with the study of Caumo W, et al. (2001) [30]. It was found that patients who had previous hospital admission were four times more anxious before the operation, perhaps due to a previous negative experience as a result of the low pre- and postoperative nursing services in these government hospitals in this city and this does not match the results of the study conducted in the north Western Ethiopia, which did not find any relationship between this variable and pre-operative anxiety [40]. While our study coincided with another study that found that previous hospital admission accompanied by surgery increased pre-operative



anxiety, especially if it was for a long period [34]. It has been found that patients who have previous surgery suffer from preoperative anxiety about eight times less than those who do not have surgery, this inverse relationship between previous surgery and anxiety was found in many studies [21-28]. Having previous surgical experience may reduce preoperative anxiety by reducing misconception and fear of the unknown. While studies have found the opposite, it may be because patients experienced life-threatening life events, such as the death of a patient next door in the hospital during that time [33] or because of a previous negative experience, such as having complications or post-operative infections [44,45]. This study found an important statistical relationship between pre-operative anxiety and pre-operative pain, and we believe that this type of anxiety is justified by pain, especially if we know that pre-operative pain represents a constant risk factor for the emergence of pre-operative anxiety in a wide range of the surgical cases [46], we already know the relationship between postoperative pain with pre-operative anxiety. This study did not find a relationship between explanation regarding the surgery and pre-operative anxiety, this contrasts with the results of studies conducted in Karachi and southwestern Ethiopia. We may explain the result that we found that most patients in this city throw their weight on God in saving them more than they throw their weight on the doctor and This is why they frequently pray before the operation, they appeal to the Lord to take care of them and to be kind to them. As a result of the way patients think and believe, we have found no such relationship. This study found a relationship between the extent of the surgery and pre-operative anxiety, and this corresponds to several studies [47,48]. While the study conducted in southwestern Ethiopia found this relationship statistically significant only in bivariate analysis model, however, when they used multivariate analysis model, the result was important only for single and divorced patients exclusively [17]. This study did not find a relationship between the type of surgical operation and the pre-operative anxiety, this result is consistent with the results of the study conducted in the city of Sousse in Tunisia, but it is not consistent with the study conducted in Turkey [18]. Which found more anxiety among women and in gynecological operations and also did not agree with the study of Jaffar and Khan in Pakistan [21]. On the whole there are contradictory results regarding this relationship. Some authors did not take the type of surgery into consideration for anxiety, while others suggested chest, nose, ear, and throat surgery as the main causes of anxiety before surgery.

## Strengths and limitations

### Strengths

This is the first study in Iraq to shed light on this topic. It provided us with valuable information about the prevalence of preoperative anxiety and its related factors among surgical patients in 2 Iraqi hospitals.

### Limitation

The study did not include emergency surgery patients and groups of young patients due to the difficulty of cooperation and problems resulting from common forms such as pain and accidents. The patients were interviewed once and our facilities did not allow us to meet them again after we gave them information about surgery and anesthesia, so we did not know whether pre-operative anxiety became less or not. The study also did not measure the level of anxiety before hospitalization.

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