

## Evaluation of Anxiety Levels in Patients undergoing Interventional Pain Procedures

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### Abstract

Anxiety is a mental condition of apprehension, worry and concern over dangerous events correlated with physiological alertness. Chronic pain patients who require interventional pain procedures provide unique challenges to anaesthesiologists. This patient population often presents with significant psychiatric comorbidities and complex poly-pharmacy. Anxiety can produce apprehensive reactions that result in an increase in distress experienced by the patient and make the management and control of pain more difficult.

Planning interventional pain procedures can also augment the levels of anxiety in patients. Concurrent anxiety, hyper-algesia, and claustrophobia can make interventional management of these patients difficult. Interventional pain procedures often require patient awareness and feedback for specific aspects of the procedure to avoid serious complications.

Consequently, it is important to discover an alternative therapy to relieve anxiety and pain. It is well known that anxiety can alter the course of pain.

There are various pharmacological strategies to reduce anxiety but the current short-acting anxiolytic agents like Benzodiazepines and pain-relieving opiates are associated with numerous side effects such as drug tolerance, abuse and sedation.

Pre-procedure counselling, along with non-pharmacological techniques like such as spiritual rituals, music, meditation, and information provision like an informed and explained consent are known to be strategies helpful in reducing pre-procedural anxiety

This study is one of the few studies done on patients undergoing interventional pain relieving procedures. Based on our findings, we come to know how significantly prevalent is anxiety in such patients of different age & gender groups as well as we can see how appropriate counselling and education before the procedure can cause a decrease in anxiety levels. Further, more studies are needed which will help further to identify factors contributing to anxiety thereby improving outcomes in patients undergoing interventional pain relieving procedures.

**Keywords:** Anxiety, Chronic Pain, Interventional Pain Procedures.

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### Introduction

Anxiety, depression, somatoform disorders and fear of pain are reported to be

commonly found in research on patients undergoing elective surgery. Among these,

preoperative anxiety, the prevalence of preoperative anxiety has been reported to vary from 11% to 80% [1] in adult patients is of specific significance as a factor in increasing perioperative morbidity. It is an emotional response associated with several pathophysiological responses accompanied by activation of the autonomous nervous system. The level of preoperative anxiety may adversely affect different aspects of anaesthesiological approaches, surgical recovery and various outcomes.

Different factors that play a role in the production of preoperative anxiety include: age, gender predisposition, unawareness of patients about anaesthesia and the role of the anaesthesiologist in their treatment, apprehension of death when performing surgery under general anaesthetic, and postoperative pain and nausea encounters.

Pre anaesthetic measurement has many targets regardless of these variables. Nevertheless, inadequate education, the physical structure and severity of the anaesthesia facility, as well as economic difficulties in various countries, can often contribute to shortcomings in reducing patient commitment to care.

The main objective of this study is to observe the preoperative anxiety levels of patients admitted to KGMU, Lucknow for interventional pain relieving procedures.

### Material and Method

The study was conducted in the pain unit of department of Anaesthesiology, King George Medical University, Lucknow after approval by the institutional ethics committee. After referral from the pain clinic, Written and informed consent was taken from the patient and the procedure planned will be explained. A quick thorough assessment of the patient would be done including physical examination, laboratory investigations along with necessary consultations and references

from other concerned departments. The patient's medical history, drug history including previous surgical and anaesthesia experiences were taken.

A STAI questionnaire was presented to the patient for self-administration before and after the planned procedure. Also the VAS score was recorded before and after the procedure. Patients were enquired about pre-procedural counselling.

The anxiety levels of the patients are divided into Low (20-37), Moderate (38-44) and High anxiety ( $\geq 45$ ) before and after the procedure.

### Inclusion Criteria:

1. Patients aged 18 years and above coming to pain OPD with pain requiring interventional pain-relieving procedures.
2. ASA I, II patients.

### Exclusion Criteria:

1. Patients with significant cognitive impairment.
2. Psychiatric illness patients.
3. Patients with coagulation abnormalities.
4. ASA  $\geq$  III Patients.

### Result

**Demography Of Study:** Total 154 patients were taken in the study of which 50% (77) each were male and female, with mean age  $47.06 \pm 13.26$  (18-80 years).

### Prevalence:

Mean pre-procedure STAI is  $42.83 \pm 8.43$ , with a median STAI of 42 among all 154 patients. With STAI score ranging from minimum of 26 to maximum of 62

The prevalence of pre-procedural anxiety in total patients can be divided into high intensity (STAI > 45) in 30 (19.4%) and moderate to low anxiety levels (STAI  $\leq$  45) in 125 (80.6%) out of total patients

**Table 1: Anxiety score statistics**

Anxiety score	Value
Mean±SD	42.83±8.43
Range	29-62
Median	42.0

**Table 2: Prevalence of Anxiety Among The Studied Patients Before Procedure.**

Prevalence Of Anxiety Among The Studied Patients Before Procedure		
Prevalence Of Anxiety	Frequency	Percentage
High anxiety (>45)	30	19.4
Moderate anxiety (38-44)	75	48.3
Low anxiety (<38)	50	32.3

Demographic and clinical data among studied patients according to the level of anxiety is further found to be as follows:

High level anxiety is common in age with median of 49.63±12.95 years

High level of anxiety is more common in female patients i.e. 26 out of 30 (86.7%)

While moderate to low anxiety is more prevalent in male patients (59.2 %); with a significant p value of <0.001, establishing gender as strong predictor of pre procedure anxiety.

**Table 3: Age and Gender wise variability**

Variables	High anxiety (n=30)	Low to moderate anxiety (n=125)	P value
Age (years)	49.63±12.95	46.45±13.31	0.239
Gender			
Female	26 (86.7%)	51 (40.8%)	<0.001
Male	4 (13.3%)	(59.2%)	

### Variation In Anxiety Levels Before And After Procedure

There is significant reduction in anxiety levels ( $p < 0.001$ ) after the intervention has been done. Mean STAI in females decreased from  $40.58 \pm 5.86$  before procedure to  $33.82 \pm 5.29$  after the procedure.

In males, it decreases from  $45.10 \pm 9.93$  to  $37.97 \pm 8.69$ .

**Table 4: Comparison of pre procedure STAI and post procedure STAI of male and female patients**

	Gender	Mean ± SD	Min.-Max.	P value
Pre STAI	Male (n=77)	40.58±5.86	29-58	<0.001
	Female (n=77)	45.10±9.93	30-62	
POST STAI	Male	33.82±5.29	25-48	<0.001
	Female	37.97±8.69	20-51	

ANOVA test

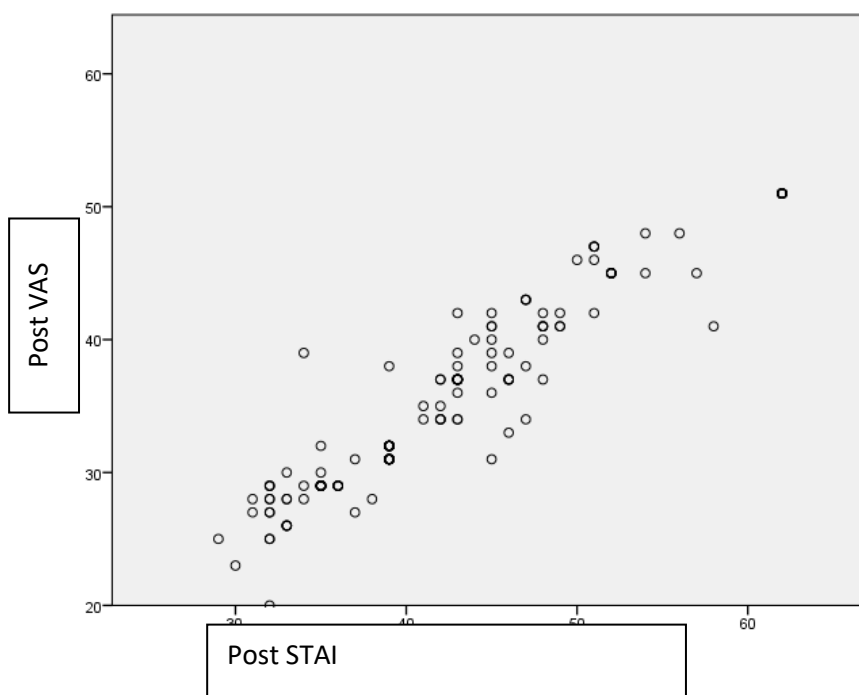
### Correlation between pain and anxiety levels before and after procedure

There is also a strong relation between pain (as measured by VAS score) and anxiety (STAI),  $p < 0.001$  both before and after procedure with before procedure vas mean of  $7.10 \pm 0.91$  {median VAS 7} decreasing post procedure to  $2.27 \pm 1.03$  {median VAS 3} with STAI score decreasing from  $42.83 \pm 8.43$  to  $35.88 \pm 7.46$ .

There is strong positive [ $p < 0.001$ ] correlation between VAS (pain) and STAI(anxiety) and the association is significant .The r value for pre VAS and pre STAI is 0.678 and that for post VAS and post STAI is 0.730.

**Table 5: Comparison of pre and post procedure VAS score and STAI score of patients**

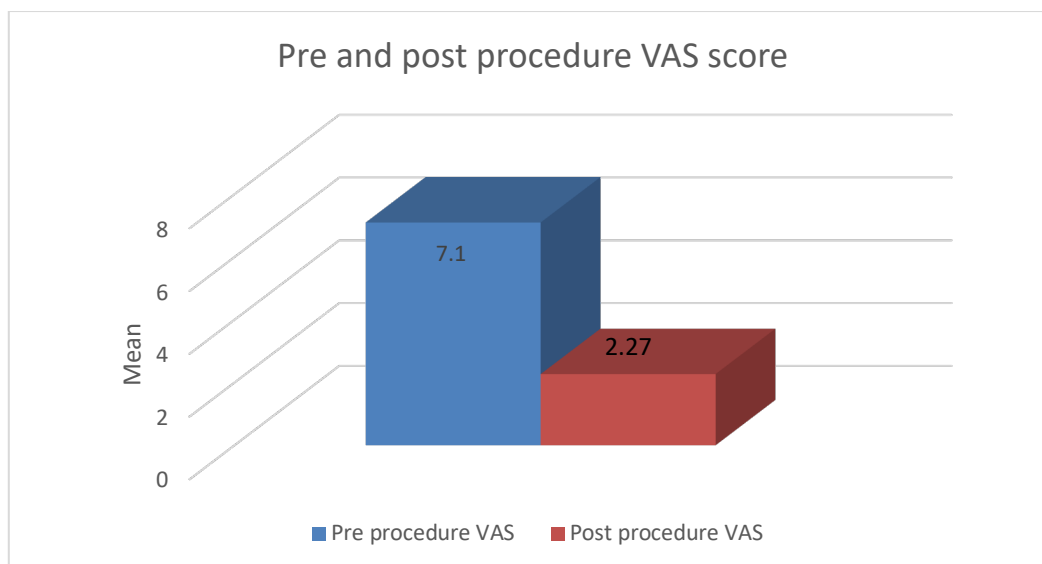
	Pre procedure		Post procedure	
	VAS	STAI	VAS	STAI
Mean±SD	7.10±0.91	42.83±8.43	2.27±1.03	35.88±7.46
p-value	<0.001		<0.001	
Median	7.00	42.00	3.00	34.00
Minimum	5	29	1	20
Maximum	9	62	4	51



**Table 6: Correlations Between STAI and VAS**

Correlations					
		Pre STAI	POST STAI	Pre VAS	POST VAS
Pre STAI	Pearson Correlation	1	.951**	.678**	.692**
	Sig. (2-tailed)		.000	.000	.000
	N	154	154	154	154
POST STAI	Pearson Correlation	.951**	1	.662**	.730**
	Sig. (2-tailed)	.000		.000	.000
	N	154	154	154	154
Pre VAS	Pearson Correlation	.678**	.662**	1	.745**
	Sig. (2-tailed)	.000	.000		.000
	N	154	154	154	154
POST VAS	Pearson Correlation	.692**	.730**	.745**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	154	154	154	154

\*\* . Correlation is significant at the 0.01 level (2-tailed).

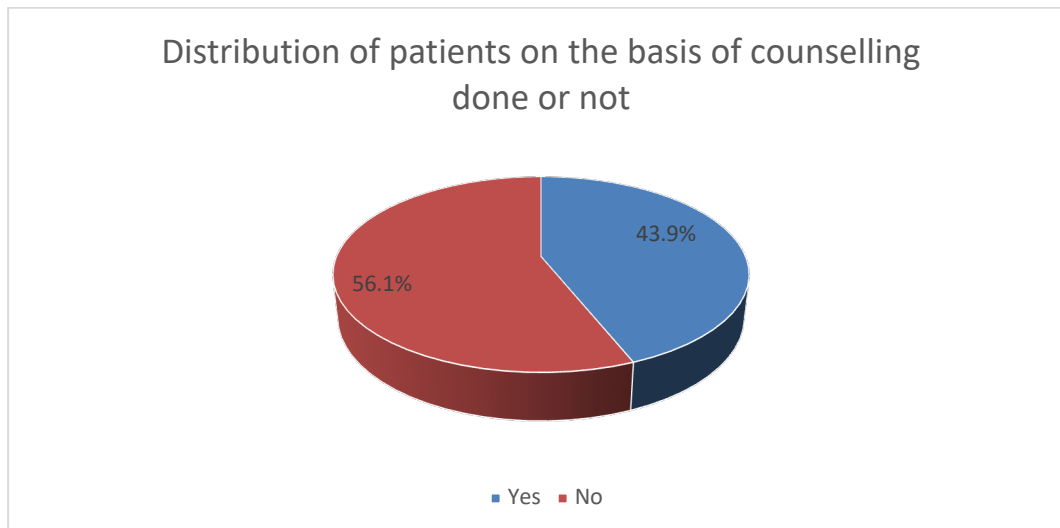


**Effect of pre procedure counselling on anxiety levels :**

67 out of 154 (43.9 %) patients were found to be counseled before procedure to alleviate any procedure related anxiety and fears.

With a significant p value of 0.035 , mean STAI in patients who were counseled decreases from  $41.56 \pm 6.37$  to  $35.26 \pm 6.26$

Also, a significant difference (p value < 0.001) was found between pre- procedural anxiety levels between counseled (MEAN STAI  $41.56 \pm 6.37$ ) and non- counseled patients (MEAN STAI  $44.44 \pm 10.31$ )



**Table 7: Comparison of pre procedure STAI and post procedure STAI of patients of those Pre procedure counselling was done. [ANOVA test]**

	Pre procedure counselling done	Mean±SD	Min-Max	P value
Pre pro. STAI	Yes (n=67)	41.56±6.37	29-56	0.035
	No (n=87)	44.44±10.31	30-62	
POST pro STAI	Yes (n=67)	35.26±6.26	25-48	0.244
	No (n=87)	36.68±8.74	20-51	

ANOVA test

## Discussion

In patients undergoing surgical and interventional procedures, anxiety, depression, somatoform disorders and fear of pain are reported to be commonly found. Among these, the prevalence of preoperative anxiety among patients planned for elective non-life-threatening surgeries has been reported to vary from 11% to 80% [1,10]. In adult patients, anxiety is a significant factor in increasing perioperative morbidity. Anxiety is an emotional response associated with several pathophysiological responses accompanied by the activation of the autonomous nervous system.

The main aim of this study was to assess and evaluate the prevalence of anxiety among patients undergoing interventional pain-relieving procedures.

In our study, a total of 154 patients were taken in the study of which 50% (77) were male and female, with a mean age of  $47.06 \pm 13.26$  (18- 80 years).

The mean pre-procedure STAI is  $42.83 \pm 8.43$ , with a median STAI of 42 among all 154 patients, with STAI score ranging from a minimum of 26 to a maximum of 62

The prevalence of pre-procedural anxiety in total patients can be divided into high intensity ( STAI > 45) in 30 (19.4%) out of 154 and moderate to low anxiety levels (STAI ≤ 45) in 125 (80.6%) out of 154 patients.

Our observation is consistent with Erkilic *et al* [1], who demonstrate that In the study population, the mean preoperative trait anxiety score was  $40.6 \pm 8.5$ , while the state anxiety score was  $38.0 \pm 9.9$ . His study also stated a significant prevalence of anxiety in patients before elective surgeries Trait STAI was not considered in our study, only focussing on State STAI to be specific to only the procedure-related anxiety.

Our findings regarding the prevalence of pre-procedural anxiety based on STAI are also in line with Kayikcioglu *et al*. [4]

according to whom, the average state and trait anxiety scores were  $49.78 \pm 8.36$  and  $44.41 \pm 6.04$ , respectively (Wilcoxon test  $p < 0.001$ ).

Our findings are consistent with M. S. Almalki *et al* [15], who performed a cross-sectional study conducted among 278 patients admitted for elective nonlife-threatening surgeries... They observed that the overall preoperative anxiety score had a mean  $\pm$ SD of  $18.2 \pm 5.8$ .

Our finding of the prevalence of anxiety before any elective intervention is also following Fekrat *et al* [13] which demonstrated that Median scores for anxiety as estimated with visual analogue scales by anaesthetists, surgeons and patients for anaesthesia were 34, 36 and 6, respectively; and for surgery 53, 47 and 9, respectively. The anxiety subscale of the Hospital Anxiety and Depression Scale is  $8.9 \pm 4.2$ ,  $8.6 \pm 4.6$  and  $6.5 \pm 4.5$  (mean  $\pm$  SD), respectively. Doctors' scores were significantly higher than the patients' scores ( $P < 0.05$ ).

Pre-procedure anxiety is significantly more prevalent in the female population and higher age group patients. High-level anxiety is common in age with a median of  $49.63 \pm 12.95$  years and is more common in female patients i.e. 26 out of 30 (86.7%) while moderate to low anxiety is more prevalent in male patients (59.2 %); with a significant p-value of  $< 0.001$ , establishing gender as a strong predictor of pre-procedure anxiety.

There is a significant reduction in anxiety levels (  $p < 0.001$ ) after the intervention has been done. Mean STAI in females decreased from  $40.58 \pm 5.86$  before the procedure to  $33.82 \pm 5.29$  after the procedure. In males, it decreases from  $45.10 \pm 9.93$  to  $37.97 \pm 8.69$ .

In these subjects, age and sex are two of the most talked about parameters. Mainly, it is evident from our study that older age and

female sex increase procedure-related anxiety. Results from other studies confirm these findings. However, some authors stated that in older adults, anxiety disorders and depression were less prevalent, so older people were less anxious than younger ones preoperatively. The oldest patient in our study was 80 years, which could be an intermediate old age in other Asian populations.

Our findings align with M. Yilmaz *et al* [12], conducted a descriptive study that included 500 patients in a surgery clinic. In the results they observed that out of 500 patients, the prevalence of anxiety was high in patients of which 59.6% were female, 54.6% were 65 years of age or older, 80.6% were married, 70.4% were literate and 62% of the patients had moderate level surgery. There was a significant relationship between the socio-demographic patient features, the level of preoperative anxiety, the presence of social support and the severity of anxiety.

Our observation is consistent with Erkilic *et al* [1], who demonstrate that In the study population, younger and female patients had more prevalence of preoperative anxiety.

Our findings are consistent with M. S. Almalki *et al* [15], who performed a cross-sectional study conducted among 278 patients admitted for elective nonlife-threatening surgeries. They concluded that the patients who underwent elective surgery had high preoperative anxiety. The patients of younger age, female gender, patients under general anaesthesia, or those who had no family support showed a higher level of preoperative anxiety.

Our findings are also supported by T. Matthias *et al* [16], who performed a prospective study on 100 patients scheduled for elective surgical procedures. Females were more anxious than males and those who had never sustained surgery were more anxious than those who previously had surgery.

In this study, there is also a strong positive correlation between pain (as measured by VAS score) and anxiety (STAI),  $p < 0.001$  both before and after the procedure with before procedure VAS mean of  $7.10 \pm 0.91$  { median VAS 7 } decreasing post-procedure to  $2.27 \pm 1.03$  {median VAS 3 } with STAI score decreasing from  $42.83 \pm 8.43$  to  $35.88 \pm 7.46$ .

Our findings regarding the decrease in post-procedural anxiety are also in line with Kayikcioglu *et al* [4] who showed that one-quarter of the patients in their study who had to undergo intra- vitreal injection had high anxiety scores. They also found a significant positive correlation between pain during the injection and pre-procedural anxiety level.

Also per our findings, W. Caumo *et al* [10] had also concluded that moderate to intense pain, medium surgery, and female gender constituted independent risk factors for preoperative state anxiety.

67 out of the total (43.9 % ) patients were found to be counselled before the procedure to alleviate any procedure-related anxiety and fears. The pre-procedure anxiety in a counselled patient has a mean STAI of 44.46 while that in a patient who was not found to be counselled has a mean STAI of, and this sign is significant ( $p < 0.001$ ).

With a significant p-value of 0.035, the mean STAI in patients who were counselled decreased from  $41.56 \pm 6.37$  to  $35.26 \pm 6.26$ . This decrease in pain along with anxiety levels is significant.

While in patients who were not counselled, mean STAI pre-procedure decreased from  $44.44 \pm 10.31$  to  $38.68 \pm 8.74$ , with the decrease not being significant (p-value 0.244).

Also, a significant difference (p value  $< 0.001$ ) was found between pre- procedural anxiety levels between counseled (MEAN STAI  $41.56 \pm 6.37$ ) and non- counseled patients (MEAN STAI  $44.44 \pm 10.31$ ).

Our conclusion on the effect of pre-procedure counselling on anxiety levels is also in agreement with M. Jawaid *et al* [14], who concluded that, although patients undergoing elective surgery are assumed to have a lower level of stress and subsequent anxiety, a high level of preoperative anxiety has been reported among those patients. This study concluded that the establishment of preoperative counselling clinics and properly informed consent taken before surgery will help in reducing preoperative anxiety.

Studies by T. Matthias *et al* [16] also show that an anaesthetist's visit and premedication reduced total anxiety scores and anaesthesia-related anxiety scores. APAIS scale was used for evaluation in this study.

Also, Wilson *et al* [7] demonstrated that pre-procedure Patient education is important for preventing and reducing anxiety levels in patients planned for interventional pain procedures. In his study both non-pharmacological and pharmacological interventions are effective in reducing patient anxiety and treatment should be based on patient preference, resources available, and the surgeon's experience.

Shun Yuan Lin *et al* [9] also concluded in their study that perioperative anxiety was significantly reduced and overall patient satisfaction increased after viewing a preoperative educational anaesthesia video compared with a standard verbal briefing on anaesthesia.

It is evident in this study that almost all of our patients were anxious before the procedures, but to different extents. We found that interventional pain procedural-related anxiety is a common phenomenon to be found in patients. Levels of anxiety are directly related to the level of pain experienced by the patients. Anxiety can be attributed to a lack of sufficient access to information on the planned procedures. Preoperative counseling significantly reduces anxiety levels and facilitates

treatment compliance. Patients exhibiting high-level anxiety can be identified preoperatively, and their anxiety levels reduced via adequate and appropriate counselling and anxiolytic premedication. A concurrent decrease in anxiety level symptoms may improve outcomes.

This study is one of the few studies done on patients undergoing interventional pain relieving procedures. Based on our findings, we come to know how significantly prevalent is anxiety in such patients of different age & gender groups as well as we can see how appropriate counselling and education before the procedure can cause a decrease in anxiety levels. Further, more studies are needed which will help further to identify factors contributing to anxiety thereby improving outcomes in patients undergoing interventional pain relieving procedures.

#### Limitations Of Our Study

1. The possible limitation of our study
2. Relatively small sample size
3. Single Centre study

#### Conclusion

In conclusion, Anxiety is significantly prevalent in patients undergoing interventional pain relieving procedures. Moderate to low levels of anxiety is more prevalent than High anxiety levels. Prevalence of anxiety is more among higher age group population.

Female population has more prevalence of overall pre and post procedure anxiety than male population and also higher precedence for high level of anxiety as compared to male population.

There is decrease in STAI and VAS scoring post procedures which signifies decrease in anxiety levels with decrease in pain and this reduction is significant. There is strong positive correlation between pain and anxiety levels.

Also patients who were counselled before the procedure were found to have lesser



prevalence of anxiety than the patients who were not counselled.

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