

Patient's Perspective of Preoperative Anxiety and Need for Support- An Observational Study

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ABSTRACT

Introduction: Majority of the patients undergoing elective surgery generally experience anxiety. Preoperative anxiety causes emotional distress and needs support to cope.

Aim: To evaluate the prevalence of preoperative anxiety in patients undergoing elective surgery and to examine association between the intensity of anxiety and need for assistance.

Materials and Methods: An observational study was conducted at Sri Devaraj Urs Medical College, Kolar, Karnataka, India on 100 participants. The inclusion criteria were- age >18 years of either sex belonging to American Society of Anaesthesiologists (ASA)- Physical Status (PS) grade I or II and undergoing elective surgery. After obtaining informed consent, a questionnaire including both Amsterdam Preoperative Anxiety Information Scale (APAIS) and Numeric Rating Scale (NRS) to measure anxiety was given to the patients in preanaesthetic evaluation clinic by anaesthesiology resident one day prior to the scheduled surgery. The questionnaire included a semi-dichotomous scale

(yes/no) for anxiety assessment; to quantify the intensity of anxiety levels the questions on APAIS were given on 5-item scale (not at all/somewhat/moderate/moderately-high/extremely) and NRS on 4-item scale (no anxiety/mild/moderate/severe).

Results: The prevalence of anxiety was 100%. The mean age was 43.3±11.9 years. The majority (53%) were females. According to NRS, majority of patients undergoing major surgeries had higher mean anxiety levels (6.95±1.96). APAIS anxiety about anaesthesia was 4.78±2.1 and about surgery was 5.52±1.9. A cut-off of 13 on the APAIS anxiety scale had a sensitivity of 90% and a specificity of 81.1%. A cut-off of 3.5 on the NRS scale had a sensitivity of 72.7% and a specificity of 65.2%.

Conclusion: All the patients undergoing elective surgery should be subjected for preoperative anxiety assessment and those with higher anxiety levels requiring support should be addressed to have better postoperative outcomes. Grade of surgery had a significant role in causing anxiety. Hence both Anaesthesiologist and Surgeons should be involved in counselling the patient.

Keywords: Assessment tool, Elective surgery, Numerical rating scale to assess anxiety

INTRODUCTION

Anxiety is commonly noticed in patients undergoing elective surgery. Anxiety causes haemodynamic changes in the preoperative period and is often associated with increased postoperative morbidity, hospital stay duration, delayed wound healing, and mortality [1]. According to literature, anxiety suppress the immune system, and causes haemodynamic changes like undue tachycardia and hypertension occurs during the perioperative period. It may also cause a decreased response to analgesics and anaesthesia [2]. Various factors play a role in causing preoperative anxiety, like previous experiences, knowledge about the surgical procedure, and anaesthesia. The prevalence of preoperative anxiety varies from 11-80% [3-9]. Another aspect of preoperative care is the patient's need for information. Various studies have shown that information given to patients before surgery may facilitate recovery [4,10-12]. Few studies have evaluated the association between preoperative anxiety levels and those requiring support [5-7].

Hence, a thorough understanding of it is necessary, which may help decrease patient's anxiety levels and improve postoperative outcomes. Therefore the study was aimed to evaluate the prevalence of preoperative anxiety in patients undergoing elective surgery. The secondary objective was to examine the association between the intensity of a patient's preoperative anxiety and the need for assistance.

MATERIALS AND METHODS

This observational study was conducted on 100 patients scheduled to undergo elective surgery at R.L. Jalappa Hospital and Research Centre, attached to Sri Devaraj Urs Medical College, Tamaka, Kolar, Karnataka, India. The study spanned from May 2022 to

August 2022. Approval from Institutional Ethics Committee (IEC) was obtained (DMC/KLR/IEC/62/2022-23 dated on 06/05/2022). Informed consent was taken from patients.

Inclusion criteria: All patients >18 years of age of either sex belonging ASA-PS I and II scheduled to undergo any elective surgery under anaesthesia were included in the study.

Exclusion criteria: Patients who underwent emergency surgery, patients with visual impairment disorders and patients refusal to take part in the study were excluded from the study.

Sample size calculation: The sample size was calculated using the prevalence of preoperative anxiety based on a previous study conducted by Salzmann et al., [4] with an alpha error of 5% and 95% confidence interval and absolute precision of 10%. The sample size estimated was 97.

$$n = \frac{Z^2 (P \cdot q)}{d^2}$$

where;

Z=Standard normal distribution for the confidence interval (1.96)

d=absolute precision (d=10%)

P=expected proportion (p=49.3%)

Q=1-p (q=50.7%)

The sample size was calculated using OpenEpi software version 3.01 (Open-Source Epidemiologic Statistics for Public Health).

Data Collection

Patients were recruited for the study during the preanaesthetic evaluation one day prior to the scheduled surgery. The patients were called for a face-to-face preoperative assessment and then

after taking informed consent, a questionnaire was given to them by a resident anaesthetist. If necessary, during the completion a member of the study team was present to help patients read the questions or answer any queries that patients might have had. If a patient was not able to read/write, the questionnaire was filled out by a resident anaesthetist after reading out the questions for him/her. All patients answered a structured questionnaire regarding the following aspects:

- Age and gender of the patients.
- Whether they have undergone any surgery in the past.
- Grade of surgery as minor, intermediate and major based on blood loss, invasiveness, degree of pain and monitoring required [3].

Minor- Laparoscopic cholecystectomy, tympanoplasty, inguinal herniorrhaphy, percutaneous nephrolithotomy.

Intermediate- abdominal hysterectomy, vaginal hysterectomy, mastectomy, Transurethral Resection of Prostate (TURP)

Major- open cholecystectomy, gastrectomy, nephrectomy, hepatectomy, nephrolithotomy.

- If they were anxious about surgery and/or anaesthesia (yes/no). If yes to proceed further and answer.

• Assessment tools:

A) Amsterdam Preoperative Anxiety Information Scale (APAIS) [10].

It includes total of six statements out of which four items (A,B,D,E) are preoperative anxiety scale and two items (C,F) are the need for information scale. Patients grade each statement with Likert scale, a 5-point scale from (1-point) "not at all" to (5-points) "extremely anxious" [Table/Fig-1].

	APAIS question	1 (Not at all)	2 (Slightly)	3 (Moderately)	4 (Very)	5 (Extremely)
A	I am worried about the anaesthetic.					
B	The anaesthetic is on my mind continually.					
C	I would like to know as much as possible about the anaesthetic.					
D	I am worried about the procedure.					
E	The procedure is on my mind continually.					
F	I would like to know as much as possible about the procedure.					

[Table/Fig-1]: Amsterdam Preoperative Anxiety Information Scale (APAIS).

Sum of scores for anxiety scale range between 4-20 and for need for information between 2-10. The cut-off value for total anxiety score is considered 10, since it has 100% sensitivity [13].

Pilot testing: A pilot study was conducted among 30 patients in the institution using modified anxiety score (mild <7, moderate 7-10, severe >10) and the standard anxiety score (mild <10 and severe >10) with cut-off value of 10. Since the study results illustrated that more patients were recruited and benefited, results were considered appropriate and the modified anxiety score was included in the main study.

The need for information regarding the surgery or the procedure of anaesthesia from the attending anaesthesiologist which might help in relieving their anxiety levels was further graded into patients requiring [10]:

No/less information: 2-4

Average information: 5-7

High information: 8-10

According to APAIS score: Anxiety about anaesthesia is sum of A+B, Anxiety about surgery is D+E; Sum of these two anxiety scores gives total anxiety score.

B) Numerical Rating Scale (NRS) [4,14]: The anxiety scores on a numerical scale from 0 (no anxiety) to 10 (extremely anxiety) were categorised as:

0- Not anxious

1-3- Mild anxious

4-6- Moderate anxious

7-10- Extremely anxious

STATISTICAL ANALYSIS

Collected data were entered into Microsoft excel, and the data were analysed using Statistical Package for the Social Sciences (SPSS) software version 25.0. Categorical data were reported as frequencies and percentages association and for quantitative variables, mean and SD was reported. For the continuous variables mean difference between the groups were measured by using Analysis of Variance (ANOVA) test. Receiver Operator Characteristic (ROC) curve was plotted to assess the sensitivity and specificity. A p-value <0.05 was considered statistically significant.

RESULTS

APAIS Anxiety

In the present study, the mean age group was 43.3±11.9 years and the mean anxiety levels were 10.3±3.49. The majority (53%) were females. The mean anxiety levels were more in females (10.8±3.94). Among the cases 63% belonged to ASA I, mean anxiety levels were more in ASA grade I. Of the total 100 cases, 40% underwent major surgeries and mean anxiety levels were higher in this group (12.47±3.44). Most of the cases (55%) had no history of any surgery as shown in [Table/Fig-2]. The difference in anxiety based on the grade of surgery and history of surgery was found to be statistically non significant.

Amsterdam Information Scale

The study results illustrated mean need for information among the age group was (4.94±1.82). Overall, mean need for information was higher among females (5.28±1.91) but the difference among the two variables were statistically insignificant. Patients belonging to ASA grade I, required more information (5.01±1.89) than ASA grade II. As a whole, more information was required by the cases, who underwent minor surgeries (7.66±2.35), followed by who had major surgeries (5.92±1.87). Patients who had previous exposure to surgery required more need for information (5.04±1.94), did not show any statistically significant difference as shown in [Table/Fig-3].

NRS Scale

According to NRS, the mean anxiety level was 5.56±2.20. Overall mean anxiety levels was more among females than males. Patients with ASA grade I exhibited more anxiety levels than grade two. ASA grade-wise anxiety difference was statistically non significant. Cumulatively, patients undergoing major grade surgeries had more mean anxiety levels than mild and intermediate grade surgeries. Anxiety difference based on the surgery grade was statistically significant. The cases with no previous surgery had an overall higher anxiety [Table/Fig-4].

Characteristics	All patients (N=100)	Anxiety score <7 (N=13)	Anxiety score 7-10 (N=49)	Anxiety score >10 (N=38)	Overall anxiety score Mean±SD	p-value
Mean±SD age (years)	43.3±11.9	39.9±13.2	44.5±10.7	42.9±12.9	10.3±3.49	0.460
Sex						
Male	47	7 (14.9%)	21 (44.7%)	19 (40.4%)	9.65±2.81	0.698
Female	53	6 (11.3%)	28 (52.8%)	19 (35.8%)	10.8±3.94	
ASA grade						
Grade I	63	10 (15.9%)	29 (46.0%)	24 (38.1%)	10.4±3.67	0.500
Grade II	37	3 (8.1%)	20 (54.0%)	14 (37.8%)	10.1±3.20	
Grade of surgery						
Minor	33	5 (15.2%)	18 (54.5%)	10 (30.3%)	7.66±2.35	0.591
Intermediate	27	4 (14.8%)	10 (37.0%)	13 (48.2%)	10.2±2.39	
Major	40	4 (10.0%)	21 (52.5%)	15 (37.5%)	12.47±3.44	
History of surgery						
Yes	45	8 (17.8%)	20 (44.4%)	17 (37.8%)	10.33±3.90	0.410
No	55	5 (9.1%)	29 (52.7%)	21 (38.2%)	10.27±3.15	

[Table/Fig-2]: Anxiety scores according to APAIS.
t-test and ANOVA

Characteristics	All patients (N=100)	No/Less information required (N=47)	Average information required (N=43)	High information required (N=10)	Overall information score Mean±SD	p-value
Mean±SD age (years)	43.3±11.9	42.8±11.4	43.6±11.9	44.2±15.2	4.94±1.82	0.928
Sex						
Male	47	20 (42.5%)	20 (42.5%)	7 (14.9%)	4.55±1.65	0.286
Female	53	27 (50.9%)	23 (43.4%)	3 (5.6%)	5.28±1.91	
ASA grade						
Grade I	63	30 (47.6%)	27 (42.9%)	6 (9.5%)	5.01±1.89	0.974
Grade II	37	17 (45.9%)	16 (43.2%)	4 (10.8%)	4.81±1.71	
Grade of surgery						
Minor	33	19 (57.6%)	11 (33.3%)	3 (9.1%)	7.66±2.35	0.678
Intermediate	27	11 (40.7%)	13 (48.2%)	3 (11.1%)	5.11±1.33	
Major	40	17 (42.5%)	19 (47.5%)	4 (10.0%)	5.92±1.87	
History of surgery						
Yes	45	23 (51.1%)	17 (37.8%)	5 (11.1%)	5.04±1.94	0.633
No	55	24 (43.6%)	26 (47.3%)	5 (9.1%)	4.85±1.73	

[Table/Fig-3]: Need-for-Information scores according to APAIS.
t-test and ANOVA

Characteristics	All patients (N=100)	Mild (N=24)	Moderate (N=42)	Severe (N=34)	Overall NRS Mean±SD	p-value
Mean±SD age (years)	43.3±11.9	43.3±11.9	39.6±11.3	43.9±12.2	5.56±2.20	0.208
Sex						
Male	47	12 (25.5%)	16 (34.0%)	19 (40.4%)	5.06± 2.02	0.286
Female	53	12 (22.6%)	26 (49.1%)	15 (28.3%)	6±2.28	
ASA grade						
Grade I	63	18 (28.6%)	25 (39.7%)	20 (31.8%)	5.61± 2.25	0.376
Grade II	37	6 (16.2%)	17 (45.9%)	14 (37.8%)	5.45± 2.15	
Grade of surgery						
Minor	33	12 (36.4%)	8 (24.2%)	13 (39.4%)	3.69± 1.64	0.031*
Intermediate	27	8 (29.6%)	12 (44.4%)	7 (25.9%)	5.77± 1.42	
Major	40	4(10%)	22(55%)	4(35%)	6.95± 1.96	
History of surgery						
Yes	45	14 (31.1%)	14 (31.1%)	17 (37.8%)	5.53± 2.40	0.112
No	55	10 (18.2%)	28 (50.9%)	17 (30.9%)	5.58± 2.05	

[Table/Fig-4]: Distribution of patients according to NRS scale (there were no patients who were 'not anxious').
t-test and ANOVA

APAIS and Need for Information Scale

From [Table/Fig-5], it was concluded that as the anxiety score increased, more information was required.

Anxiety Levels (NRSS) and Need for Information Scale

Of the severe NRS Score cases, 29.4% required high information and among the mild and moderate NRS Score cases, none required

high information. From [Table/Fig-6] it was concluded that as the anxiety score increased, more information was required.

APAIS-Anxiety vs Need for information	No/Less information required (N=47)	Average information required (N=43)	High information required (N=10)	Total (N=100)
Anxiety score <7 (N=13)	12 (92.3%)	1 (7.7%)	0	13 (13%)
Anxiety score 7-10 (N=49)	31 (63.3%)	18 (36.7%)	0	49 (49%)
Anxiety Score >10 (N=38)	4 (10.5%)	24 (63.2%)	10 (26.3%)	38 (38%)
Total	47 (47%)	43 (43%)	10 (10%)	100 (100%)

[Table/Fig-5]: Distribution between anxiety levels and need for information. Chi-square value=43.315, p-value 0.0001

NRS-Anxiety vs Need for information	No/Less information required (N=47)	Average information required (N=43)	High information required (N=10)	Total (N=100)
Mild (N=24)	22 (91.7%)	2 (8.3%)	0	24 (24%)
Moderate (N=42)	24 (57.1%)	18 (42.9%)	0	42 (42%)
Severe (N=34)	1 (2.9%)	23 (67.6%)	10 (29.4%)	34 (34%)
Total	47 (47%)	43 (43%)	10 (10%)	100 (100%)

[Table/Fig-6]: Association between Anxiety levels (NRSS) and need for information scale. Chi-square value=56.073, p-value 0.0001

In the present study, APAIS anxiety about anaesthesia was 4.78 ± 2.1 , APAIS anxiety about surgery was 5.52 ± 1.9 , and APAIS total score was 15.24 ± 5.1 [Table/Fig-7].

A cut-off of 13 on the APAIS Anxiety scale had a sensitivity of 90% and a specificity of 81.1% to predict the need for high information. A cut-off of 3.5 on the NRS scale had a sensitivity of 72.7% and a specificity of 65.2% [Table/Fig-8].

APAIS	Mean \pm SD
Anxiety about anaesthesia	4.78 \pm 2.1
Anxiety about surgery	5.52 \pm 1.9
Total anxiety score	15.24 \pm 5.1

[Table/Fig-7]: APAIS of anaesthesia, surgery, and total score.

Scales	Area under curve (AUC)	Cut-off value	Sensitivity	Specificity
APAIS	0.9322	13	90%	81.1%
NRS	0.882	3.5	72.7%	65.2%

[Table/Fig-8]: ROC curve for determining cut-off, sensitivity, and specificity for APAIS-Anxiety scale to predict the need for high information and NRS.

DISCUSSION

Aust H et al, had used a validated APAIS and modified numerical rating scale to assess prevalence and intensity of anxiety. 92.6% reported preoperative anxiety according to APAIS scores. Predominantly females reported higher anxiety levels (57%) [5]. The current study results revealed similar results 100% prevalence of anxiety and majority of females 53% showed higher anxiety levels.

The current study results showed, patients who had experienced surgery previously were more anxious and required more information than those who did not had previous experience according to APAIS scale. Whereas, contrasting results were shown in a study conducted by Matthias AT and Samarasekera DN which used both APAIS and State Trait Anxiety Inventory questionnaire. Those patients who had never sustained surgery were more anxious than those who previously had surgery. The study also illustrated that the reliability of the APAIS was high [6]. Interestingly a study conducted by Khalili N et al., did not show significant association between history of surgery and state anxiety levels [12].

The present study concluded that anxiety level increases with the surgery grade as it proceeded from minor to major in both APAIS and NRS scale, but need for information was less in cases who

underwent major surgeries when compared to minor surgeries. This was in accordance with studies by Laufenberg FR and Kappis B, where APAIS questionnaire was used as a screening tool and concluded that patients with high anxiety levels were scheduled to undergo major grade of surgery [15].

In the present study, APAIS anxiety about anaesthesia was 4.78 ± 2.1 and about surgery was 5.52 ± 1.9 . Similar findings were reported by Acharya S et al., who found a lower anxiety score among patients about anaesthesia (4.53 ± 1.20) and higher anxiety about surgery (5.33 ± 1.36) [9].

The study by Aust H et al., also states that in APAIS scoring system mean anxiety about surgery was higher than mean anxiety about anaesthesia which was in accordance with the present study conducted [5].

In the present study, the APAIS anxiety scale had 90% sensitivity and 81.1% specificity, with 95% confidence interval, the cut-off point was 13. Similar results were illustrated by Romero MV et al., who obtained a cut-off point of 14 [13]. Whereas, contrasting results were shown by Jovanovic K et al., who obtained a cut-off point of 8 [16]. Hence, a higher cut-off value will have higher sensitivity and specificity. NRS anxiety scale had 72.7% sensitivity and 65.2% specificity with 95% confidence interval, the cut-off value was 3.5.

Limitation(s)

In this study, the focus was not given to the study population's educational and socio-economic demographic status, which might impact the study results.

CONCLUSION(S)

The prevalence of preoperative anxiety was 100% among the study participants. Hence during the preanaesthetic evaluation assessing for anxiety should be a routine practice which aids anaesthetist's in providing better support to the patients in terms of judicious use of anxiolytics or reassurance. Also, APAIS is an effective method for assessment of anxiety intensity and need for assistance in adults when compared to NRS since the later assessment tool does not evaluate regarding need for information.

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