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Research Article

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Effectiveness of Pre-Anesthesia Clinic Consultation on Anxiety Reduction Among Adult Surgical Patients: A Prospective Cohort Study

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Abstract

Background: *In the perioperative phase, surgical patients commonly encounter stress, which can influence various aspects of anesthesia, perioperative care, and recovery times. Addressing this, pre-anesthesia evaluations aim to mitigate perioperative anxiety. However, the extent to which such consultations effectively alleviate patient anxiety before surgery remains underexplored, with only a limited number of studies offering conflicting findings on the subject.*

Objective: *To assess the effectiveness of pre-anesthesia clinic consultation on anxiety reduction among adult surgical patients at Jimma University Medical Center, Jimma Southwest, Ethiopia.*

Methods: *A prospective cohort study was conducted at Jimma University Medical Center, involving 114 surgical patients who underwent pre-anesthesia evaluation either at the pre-anesthetic clinic or upon admission to the ward during the study period. Data collection was performed through face-to-face interviews utilizing a semi-structured questionnaire. Preoperative anxiety levels were assessed using the Amsterdam Preoperative Anxiety and Information Scale before and after the intervention for both groups. Data integrity was ensured through comprehensive cleaning and validation using Epidata version 4.6. Statistical analysis was carried out using SPSS version 25, employing binary logistic regression to examine the frequency, percentage, and association between independent and dependent variables. Statistical significance was determined at a p-value of less than 0.05 through multivariate logistic regression analysis.*

Results: *The study examined 114 patients, aged between 18 and 74 years, with a mean age of 38.91 ± 13.89 years. Preoperative anxiety was present in 50.9% of the surgical patients. There was a statistically significant reduction in anxiety scores when comparing the change in mean scores from pretest to posttest between two groups: the clinic group had a mean reduction of 3.9 (95% CI: 3.47 to 4.35) and the ward group had a mean reduction of 2.6 (95% CI: 2.26 to 2.93), with a p-value of 0.001. Additionally, higher levels of anxiety were significantly associated with increasing age (p=0.003, AOR: 1.056, 95% CI: 1.02 to 1.10) and residency in a rural location (p=0.007, AOR: 0.293, 95% CI: 0.12 to 0.72).*

Conclusion: *we concluded that anesthesia evaluation taking place at the pre-anesthesia clinic is more effective in reducing preoperative anxiety as compared with the ward.*

Keywords: Anxiety Reduction, Perioperative Anxiety, Pre-Anesthesia Clinic Consultation

Abbreviations and/or Acronyms

AOR -Adjusted Odds Ratio
APAIS -Amsterdam Preoperative Anxiety and Information Scale
ASA-American Society of Anesthesiologist
CI - Confidence Interval
IRB- Institutional Review Board
JUMC- Jimma University Medical Center
PAC- Pre-Anesthesia Clinic
PACC- Pre-Anesthesia Clinic Consultation
POA- Perioperative Anxiety
SPSS- Statistical Package for Social Sciences
STAI- State-Trait Anxiety Inventory
STAI-S - State Trait Anxiety-State
STAI-T-State Trait Anxiety Trait

1. Introduction

Anxiety is a subjective experience characterized by feelings of tension, apprehension, nervousness, and worry, often accompanied by autonomic nervous system activation. It is particularly concerned with future uncertainties. Perioperative anxiety, common among surgical patients, affects all phases of anesthesia—preoperative, induction, postoperative, and recovery—resulting in a significant impact on patient care [1,2].

Patients' anxiety before surgery can stem from both the surgical procedure and anesthesia. The intensity of these anxieties varies, suggesting different underlying worries for each aspect. Understanding patients' specific anesthesia-related concerns is essential for helping them manage these anxieties effectively. Anesthetists need to focus on anesthesia-specific anxieties while acknowledging general surgical fears, especially given the limited time for preoperative consultations. Identifying and addressing these anxieties can improve patient education and overall car [3,4].

The Pre-Anesthetic Clinic (PAC) plays a crucial role in evaluating patients before surgery to assess risks and manage perioperative care. PAC consultations have been shown to improve patient outcomes by preparing them physically and mentally, identifying high-risk patients, and enhancing inter professional communication and postoperative care coordination. Despite the prevalence of preoperative anxiety and its potential impact on surgical outcomes, there is limited research on the specific anxieties related to anesthesia and the effectiveness of PAC in alleviating these anxieties [5,6]. Preoperative anxiety, described as "an unpleasant, fretful, or tense state," affects a significant proportion of surgical patients, potentially leading to emotional, psychological, and physical complications. With over 312.9 million surgeries performed annually worldwide, and 25-80% of patients experiencing preoperative anxiety, addressing this issue is crucial. Anxiety about anesthesia often involves fears of the unknown and loss of control, contributing to misconceptions about anesthesia and associated risks. High levels of anxiety can predict severe postoperative pain and complications, emphasizing the need for frequent assessment of preoperative anxiety [5].

Despite recognizing the importance of addressing anesthesia-related anxiety, previous studies have produced mixed results regarding the impact of PAC consultations on reducing preoperative anxiety. The use of various anxiety measures in these studies has hindered the ability to draw definitive conclusions. Therefore, there is a need for a standardized, practical tool like the Amsterdam Preoperative Anxiety and Information Scale (APAIS) to assess preoperative anxiety efficiently. The APAIS, validated in surgical patients and correlated with the gold standard State-Trait Anxiety Inventory (STAI), offers a brief and effective means of measuring anxiety and identifying information needs [6,8-12]. This study aims to benefit surgical patients by identifying factors that increase anxiety levels, leading to better perioperative anxiety assessments and care from anesthesia specialists. It evaluates the effectiveness of pre-anesthetic clinic consultations in reducing perioperative anxiety, providing a basis for future research to explore other causes of anxiety. The findings will serve as a benchmark for comparison with similar settings and inform action plans to reduce perioperative anxiety in surgical patients.

2. Objectives

2.1. General Objective

The study aims to assess the effectiveness of pre-anesthesia clinic consultation on anxiety reduction among adult surgical patients at JUMC, Southwest Ethiopia from November, 2023 to February, 2024.

2.2. Specific Objectives

1. To determine level of preoperative anxiety in surgical patients at JUMC.
2. To compare the degree of anxiety experienced by surgical patients assessed at the JUMC clinic versus those evaluated at the ward.
3. To identify the associated factors of preoperative anxiety for surgical patients at JUMC.

3. Methods and Materials

3.1. Study Setting and Period

The study was conducted in Jimma University Medical Center (JUMC) from November, 2023 to February, 2024. Jimma University Medical Center is one of the nation's oldest public hospitals with bed capacity of 800. It is situated 352 kilometers southwest of Addis Ababa in the city of Jimma. Currently, it is the only teaching and referral hospital in the southwest region of the nation, serving a catchment population of about 15 million people and providing services for about 16,000 inpatients, 220,000 outpatient attendants, 16,422 emergency cases, 15,120 surgical cases, and 4,500 deliveries annually. The facility provides tertiary referral care for almost 20 million people from Oromia, Gambella, SNNP, and Benshangul throughout all of south-western Ethiopia.

3.2. Study Design

A prospective cohort study design was employed among adult surgical patients.

3.3. Population

3.3.1. Source Population

All surgical patients undergoing elective surgery at JUMC.

3.3.2. Study Population

All surgical adult patients attending the Pre-anesthesia clinic and all adult patients having a pre-anesthesia evaluation in the wards a day prior to elective surgery during study period.

3.4. Eligibility Criteria

3.4.1. Inclusion Criteria

ASA I-III, ≥18 years that give consent and are scheduled to undergo elective major surgery in our hospital were included in this study.

3.4.2. Exclusion Criteria

1. Patients with diagnosed psychiatric illness.
2. Patients undergoing neurosurgery for ailments that may cause changes in cognitive function.
3. Patients on antidepressant medications.
4. Patients taking anxiolytic medications.

3.5. Sample Size Determination and Sampling Technique

3.5.1. Sample Size Determination

The sample size was calculated using GPOWER 3.1.9.2. for the difference between independent means with the assumption of a power of 80%, precision of 0.05, effect size of 0.2, repetition of measurements of 2 and correlation between the repeated measures of 0.5, which is 52 for each group. By adding 10% non-response rates, the final sample size is 114. Thus, 114 eligible adult surgical patients were included in the study.

3.5.2. Sampling Procedure and Technique

Consecutive sampling technique was employ in which, all surgical adult patients who visited JUMC during the study period and fulfilled the inclusion criteria were included until the required sample size was fulfilled.

3.6. Variables

3.6.1 Independent Variables

Socio-demographic factors like

- Age
- Gender
- Marital status
- Educational status
- Occupational status
- Residents
- Substance use
- Surgical factors and anesthesia factors

3.6.2. Dependent Variable

Preoperative anxiety level

3.7. Operational Definitions

High Anxiety: A vague feeling of dread or apprehension; a patient with a score of 11 or more on the anxiety scale of APAIS experiences anxiety [13].

Low Anxiety: APAIS score below 11 [13].

Little or no Information Requirements: Patients scoring 2-4 on the information scale of APAIS [13].

Average Information Requirement: Patients scoring 5-7 on the information scale of APAIS [13].

High Information Requirements: Patients scoring 8-10 on the information scale of APAIS [13].

Perioperative: - can be defined as the period extending from when the patient goes into the hospital, clinic, or doctor's office for surgery until discharge.

Intraoperative: defined as the period when patient goes to operation room until time patient transferred to PACU.

Postoperative: defined as the period after the patient transferred from PACU to patient discharge

3.8. Data Collection Technique and Instrument

For this study a semi-structured questioner was used, the questionnaire was adapted after reviewing similar studies [1,3,14]. The data was collected by face to face interviews the data was collected by trained and experienced data collectors. The questionnaire consists of questions on socio-demographic, previous surgical and anesthesia exposure, and the APAIS anxiety test. The APAIS anxiety assessment questionnaire was given face to face by data collectors to patients who are seen in the PAC and for patients from the ward, the questionnaire was also given before their anesthesia evaluation the night before surgery and on the day of surgery at the operation room waiting area. BSC nurses with ward assignments who are blind to the study conducted the interviews. They received training on how to complete the questionnaire, and a supervisor were overseeing data collection while checking the information on a daily basis for consistency and accuracy.

The APAIS is an easy-to-use instrument with six statements, four questions addressing patients' anxiety before anesthesia and surgery, and two questions assessing the desire for information. It is intended for use in clinical settings. This questionnaire only has six items, making it a cost- effective tool. The objects are graded on a five-point scale, with "not at all" (1) and "extremely" (5) being the end poles. The two scales it reflects are the anxiety scale (items 1, 2, 4, and 5) and the demand for information scale (items 3 and 6). The high level of patient acceptance of the APAIS was demonstrated in numerous investigations, from which reference values are provided for various patient groups (4).

3.9. Data Analysis

After the completed questionnaires were visually reviewed for accuracy, they were coded, placed into the statistical packages of Epi-data version 4.6, and exported to SPSS version 25 for analysis. It was rechecked for completeness after being exported to SPSS. To summarize factors based on each group, descriptive statistics were used. Means and range were examined for every theme, along with frequencies and percentages for categorical variables. The calculated themes were talked about. To see the relation between

independent variables with computed variable we used person correlation. The analysis for the association between independent factors and the outcome variable was done using a multivariate logistic regression. The result was considered as statistical significance at $p<0.05$. Preoperative anxiety was measured with Amsterdam preoperative anxiety and information scale for the two groups as pre and post-test. Ultimately, charts, graphs, and tables were used to display the outcome.

3.10. Data Quality Assurance

The questioner was prepared in English and translated to dominant local languages Amharic and Afaan Oromoo and back to English by two different language expertise. Training was given to data collectors. A pretest was conducted on 5% of the samples in Shenen Gibe general hospital before actual data collection. Amendment of the questioner was done after the pilot test. Facilitators and supervisors were assigned to control and guide the data collection and sample collection process, and by so doing it increased the chances of consistency in data collection.

4. Results

During the study period, 114 individuals were examined, we took 57 patients for each group of whom 40.4% (n=46) were female and 59.6% (n=68) were male. The patients' ages varied from 18 to 74 years old, with a mean age of 38.91± 13.89 years. Descriptive results sociodemographic characteristics (Table 1) and preoperative data of patients were presented based on the two groups (Table 2).

Variables		Review places		*p value*
		WARD	**PAC**	
Age (yrs.)		36.91±12.2	40.91±15.24	0.125
Gender	Male	36(63.2)	32(56.1)	0.445
	Female	21(36.8)	25(43.9)	
Education	Illiterate	11(33.3)	22(66.7)	0.074
	Read and write only	26(57.8)	19(42.2)	
	Highest grade completed	20(55.6)	16(44.4)	
Religion	Christian	28(56)	22(44)	0.257
	Muslim	29(45.3)	35(54.7)	
Residence	Urban	24(52.2)	22(47.8)	0.703
	Rural	33(48.5)	35(51.5)	
Occupation	Farmer	17(48.6)	18(51.4)	0.204
	Merchant	3(33.3)	6(66.7)	
	Private employee	3(60)	2(40)	
	Daily labourer	3(42.9)	4(57.1)	
	Government employee	11(37.9)	18(62.1)	
	Others	20(69)	9(31)	
Substance use	No substance use	39(53.4)	34(46.6)	0.663
	Alcohol	6(46.2)	7(53.8)	
	Khat	11(45.8)	13(54.2)	
	Cigarette	1(25)	3(75)	

Hint: data were presented with number (%), chi-square test, t-test, p value < 0.05 statistically significant

Table 1: Sociodemographic Data of Patients at JUMC from November, 2023 to February, 2024

The patients' most common surgical procedure was found to be general surgery, which they had 27.2% (n = 31) of, while ENT surgery had the lowest prevalence, 3.5% (n = 4). It was discovered that 36.8% (n= 42) patients, underwent regional anesthesia during surgery, whereas 63.2% (n=72) underwent general anesthetic, of whom only (11.4%, n=13) have experienced anesthesia and surgery in the past, shown in Figure 2.

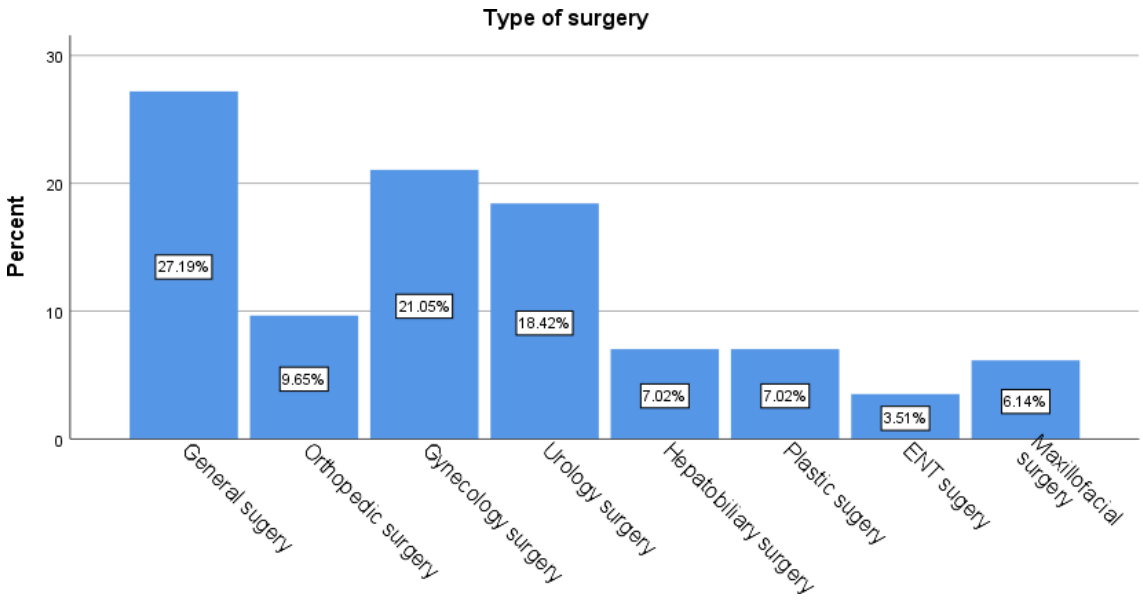

Figure 2: Types of Surgical Procedures Planned for Recruited Patients at JUMC from November, 2023 to February, 2024

Variables		**Review places**		***p value***
		WARD	**PAC**	
		n(%)	**n(%)**	
ASA status	ASA I	34(59.6)	22(39.3)	0.058
	ASA II	23(40.4)	34(59.6)	
	ASA III	0(0)	1(100)	
Anesthesia type	General	32(44.4)	40(55.6)	0.120
	Regional	25(59.5)	17(40.5)	
Surgical procedure	General surgery	12(38.7)	19(61.3)	0.196
	Orthopaedic surgery	7(63.6)	4(36.4)	
	Gynaecologic surgery	15(62.5)	9(37.5)	
	Urologic surgery	8(38.1)	13(61.9)	
	Hepato-biliary surgery	2(25)	6(75)	
	Plastic surgery	5(62.5)	3(37.5)	
	ENT surgery	3(75)	1(25)	
	Maxillofacial surgery	5(71.4)	2(28.6)	
Surgical and anesthesia Hx	Yes	7(53.8)	6(46.2)	0.768
	No	50(49.5)	51(50.5)	

Hint: data were presented with number (%), chi-square test, p value < 0.05*

Table 2: Preoperative Data of Patients at JUMC from November, 2023 to February, 2024

Prior to evaluation, the cases overall APAIS score ranged from 7 to 24, with a mean of 13.54 ± 3.06. Our patients' mean anxiety score ranged from 6 to 20, with a mean of 11.26 ± 2.57. The information scores had a mean of 5.08±2.02 and ranged from 2 to 9 and 50.9% (n=58) of patients enrolled had preoperative anxiety. APAIS Pre anxiety sub scores for surgery was 6.51±1.50 ranging from 4 to 10 and pre-anxiety sub-score for anesthesia was 4.75±1.45 ranging 2 to 10 (Table 3 and figure 3).

The cases' mean post-evaluation total APAIS score was 11.62 ± 3.18, ranging from 7 to 19. Our patients' anxiety scores ranged from 4 to 12, with a mean of 8.00 ± 2.20. The information scores had a mean of 3.61 ± 1.56 and ranged from 2 to 8.

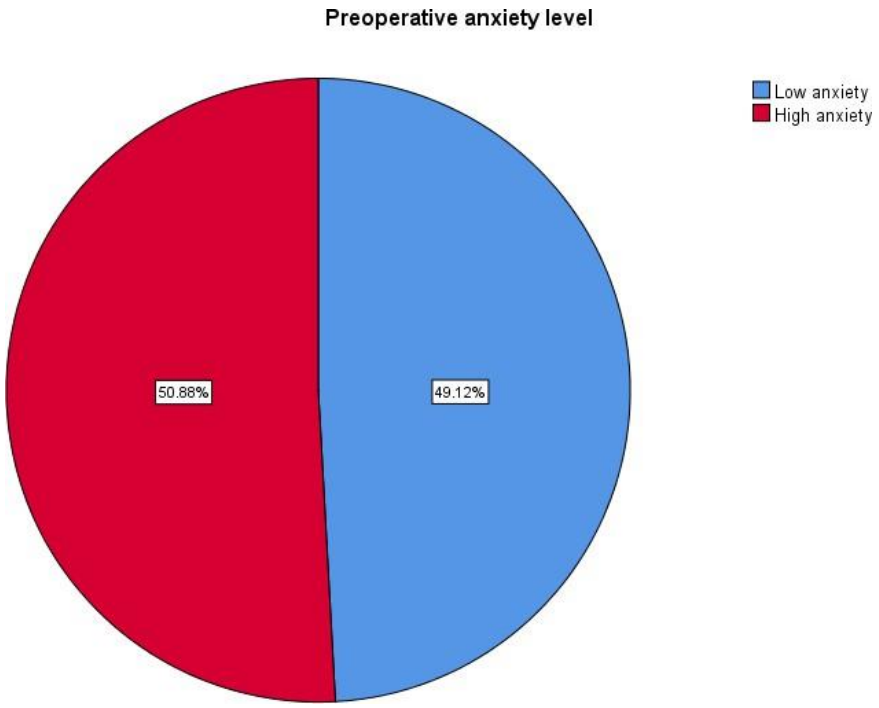

Figure 3: Preoperative Anxiety Level of Surgical Patients at JUMC From November, 2023 To February, 2024

Variables	N	Min score	Max score	Mean	SD
Anxiety related to anesthesia	114	2	10	4.8	1.45
Anxiety related to surgery	114	4	10	6.5	1.50
Total APAIS	114	7	24	13.54	3.06
Total need for information	114	2	9	5.08	2.02

Table 3: Results of the Pre APAIS-Score, Mean and Standard Deviations of Anxiety Scores and Need for Information Scores, in JUMC, Jimma, Ethiopia, November, 2023 to February, 2024

In all, 57 people were enrolled in the ward group and the clinic, a total of 68 men participated in the study; of them, 56% (n = 32) were in the clinic group and 63.2% (n = 36) in the ward. The remaining 46 female participants made up 43.9% (n = 25) in the clinic and 36.8% (n = 21) in the ward group (Figure 4).

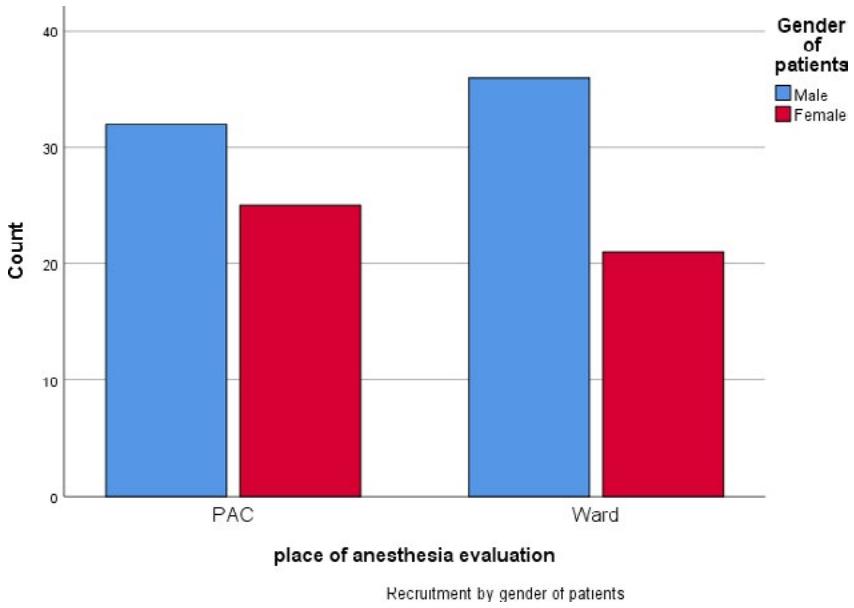

Figure 4: Bar Chart Showing Recruitment by Sex at the Study Setting at JUMC from November, 2023 to February, 2024

4.1. Statistical Analysis of Factors Associated with Preoperative Anxiety

In the current study, we were interested in investigating the relationship between sociodemographic and preoperative patient characteristics that might have an effect on the APAIS score for the pre-anxiety sub-score and the need for information sub-score before comparing the preoperative anxiety levels of the patients across the groups. Correlations between all the characteristics that may suggest preoperative anxiety and the need for information be reported before the pre-anesthetic evaluation were investigated. A statistically significant connection (r: -0.329; $p < 0.001$) was observed between the age sub- scores of pre-anxiety by 32.9%. There is no statistically significant relationship ($p = 0.641$) between the age and the information-seeking sub-scores. In terms of gender, there was no statistically significant difference found between the pre-anxiety sub-score and the demands for knowledge sub-scores ($p > 0.05$).

There was statistically significant correlation between ASA status of patients and sub-score of pre-anxiety (r: 0.387; $p<0.001$) but there was not a statistically significant link between the need for information. Marital status and the pre-anxiety sub-score (r: -0.306; p=0.001), as well as the demand for information sub-score (r: 0.210; p=0.025), showed statistically Significant correlations. There was a statistically significant connection (r: -0.272; p=0.003) between the residence and pre-anxiety sub-score and with the need for information sub-score (r: - 0.234; p=0.012).

Regarding the education level, there was no statistically significant difference found between the pre-anxiety scores ($p = 0.809$) but there was a statistically significant correlation with the sub- scores measuring the need for information (r: 0.253; p=0.007).

Regarding the type of anesthesia, and type of surgery there was no statistically significant link ($p>0.05$) between the Anxiety subscore and the demand for information.

After identifying which variables exhibited statistically significant correlations, we used binary logistics regression to investigate the relationships between the variables in more detail. Using logistic regression, the effects of age, ASA status, marital status, and home area on the patient's probability of having preoperative anxiety were evaluated and those with $P< 0.25$ were entered to multiple binary logistic regression. A total of 114 patients were in the analysis. The model explained 23.5% variation in anxiety and correctly classified 71.9% of cases. (Table 4)

Variables	Categories	Preoperative anxiety		AOR(95%CI)	P- value
		YES(%)	NO(%)		
Marital status	Married	48(82.8)	30(53.6)	1	0.229
	Divorced	2(3.4)	3(5.4)	0.335(0.04,2.463)	
	Widowed	7(12.1)	22(39.3)	0.411(0.139,1.210)	
	Single	1(1.7)	1(1.8)	0.613(0.035,10.804)	
Residential area	Urban	31(53.4)	15(26.8)	1	0.007
	Rural	27(46.6)	41(73.2)	0.293(0.11,0.717)*	
Age	Mean ± SD	34.02±12.58	43.64±13.54	1.056(1.019,1.095)*	0.003

Hint: 1 reference group, p-value< 0.05 statistically significant*

Table 4: Multiple Binary Logistic Analysis to Identify Factors Associated with having POA, at JUMC, November,2023 - Feburary, 2024

For every unit increase in age, the chance that patients would experience preoperative anxiety increased by 1.056 (p=0.003 CI: 1.019,1.095). Residency in a rural area was associated with a 0.293 times less likely to experiencing higher levels of anxiety compared to patients residing in urban areas (p=0.007 CI: 0.119,0.717).

4.2. Comparison between the Two Groups on Preoperative Anxiety

4.2.1. Comparison within the Groups on Preoperative Anxiety

Regardless of the place of pre-anesthetic evaluation for both groups, the paired t-test reveals a statistically significant difference between the pre and post-evaluation anxiety tests with mean difference for PAC 3.91228 (95%CI 3.47433,4.35023) and mean difference for ward 2.59649 (95%CI 2.26064,2.93234) with a p-value<0.001 (Figure 5).

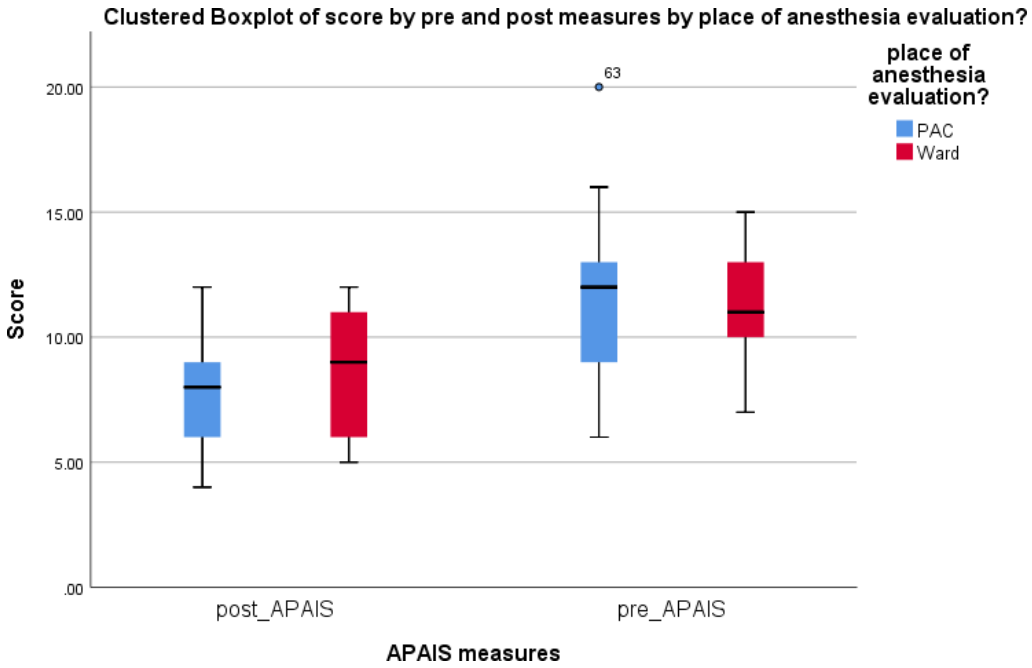

Figure 5: Clustered Box Plot for the Score by Pre and Post APAIS Test According to Place of Evaluation, JUMC, November, 2023 to February, 2024

4.2.2. Comparison of the Change in Preoperative Anxiety Score Between the Groups

Based on the pre-evaluation APAIS anxiety score, anxiety was reported by 50.9% (n=29) of the ward group patients and 52.6% (n=30) of the PAC patients, with low anxiety reported by the remaining 49.1% (n=56) of the patients.

Following evaluation, 94 % (n=108) of the patients reported low anxiety on Post APAIS test, with 98.2% (n=56) from the PAC and 91.2% (n=52) from the ward group having the lowest APAIS anx-

iety scores and 1.8% (n=1) and 8.8% (n=5), respectively, from the PAC and ward group reported having high anxiety making total of 5.3% (n=6).

We wanted to compare the APAIS score changes between the clinic and ward groups to see how much the anxiety reductions varied. The pre-evaluation group evaluated in the PAC had a mean APAIS score of 11.22 (median score 14, range 6 to 20), whereas the group reviewed in the ward had a mean APAIS score of 11.29 (median score 8, range 7 to 15). During the post-evaluation, the PAC group's mean APAIS score was 7.32 (with a range of 4 to 12), but the ward group's score was 8.7 (with a range of 5 to 12) with p-value 0.001 as shown in Table 5 below.

Location of review	Pre-anesthesia evaluation	Post-anesthesia evaluation	Change in score	P-value for the difference in changein score
PAC	11.22	7.32	3.9	Pre=0.885 Pos=0.001
Ward	11.29	8.7	2.6	

Hint: data present with mean score, independent t-test, Pre=p value of pretest, Pos=p value of posttest, p value< 0.05 statistically significant

Table 5: Comparison of Change in Anxiety Score in Clinic Versus Ward at JUMC, November, 2023 to February, 2024

5. Discussion

Preoperative anxiety represents one of the anesthetist's main perioperative challenges. So, the reduction in anxiety following a pre-anesthesia examination might be a helpful signal to show effectiveness of an anesthesia evaluation, depending on the time and location of the evaluation. The hypothesis of the research proposes that patients evaluated in PAC will have a higher degree of preoperative anxiety reduction than patients evaluated in a ward using the APAIS test.

Over all frequency of preoperative anxiety in the study was 50.9% as suggested by APAIS anxiety sub-score was 11 and more. The literature on the global prevalence of preoperative anxiety and found that worldwide, the highest levels were reported from the African continent. Studies included were from Ethiopia, Nigeria, and Tunisia, with a range of 47–70.3% and an overall prevalence of 56% [15]. They postulated that these high levels could be attributed to patients not having adequate information or lacking understanding of their intended procedure, with patients in these countries often living in rural areas with limited access to healthcare education.

Even though the majority of patients in our study have high preoperative anxiety, the prevalence reported differs from other studies done in Ethiopia using STAI scale i.e. in Debremarkos and Felege Hiwot Hospital 61% and Gondar university hospital 59% and also study done in Addis Ababa using similar tool was 58.9%, the prevalence reported in our study was lowerand on the contrary it was higher than studies done in Yirgalem 47% (17) and Tikuranbesa 39.8% [2,8,14,16]. This could be attributed to the socio demographic difference, sample size, measurement tool, and the ease with which information is available these days.

In addition, the mean APAIS score for anesthesia anxiety and surgery anxiety was similar observational study done in Germany with the means of 4.8 ± 1.4 and 6.5 ± 1.5 respectively unlike the results of the study done in Addis Ababa where patients feared anesthesia significantly more than surgery [8,17]. This could be because majority of patients are from rural area and have less exposure to information about anesthesia are less likely to discuss their concerns.

The total mean anxiety score was 13.5 ± 3.06 and mean desire for information score was 5.08 ± 2.02 which was higher when compared to the mean APAIS score for global anxiety (7.2 ± 3.7) and mean desire for information (5.7 ± 2.3) of that of the French version. This might be explained by the fact that literacy is higher in developed countries and that they used more advanced patient center evaluation including video assisted administration during preoperative evaluations [18].

Different factors can affect the anxiety levels in patients which vary from country to country. In this study, the socio-demographic characteristics that was found to be significantly associated with preoperative anxiety was residential area, indicating that patients in Urban areas have higher levels of anxiety in line to a study in Addis Ababa [19]. This could be because patients in urban areas are more accustomed to expressing their feelings.

However, our study shows lack of significant effect of gender which was similar with study done in UK and study in Jimma, which is not in line with study done in china, Amsterdam and Northwest Ethiopia, Some studies have shown that females experience more preoperative anxiety than males [9,2,3,11,20]. A further study on this subject with a larger sample size is suggested.

In contrast to our findings, which showed no association with anxiety, higher education was found to be associated with higher levels of anxiety in study done in Pakistan and also study in Jimma stated the proportion of participants with preoperative anxiety in this study appeared to increase with increasing level of education even though it was reported to not be statistically significant [3,21]. Nonetheless, there was a statistically significant association found with the sub- scores indicating the information requirement; this could be because of Higher educated patients were probably more conscious of the risks associated with anesthesia and surgery.

Previous research has noted that patients with higher levels of education exhibited a higher frequency of information seeking behavior [21,22].

In this study we found the preoperative patient factor that has statistically significant association with preoperative anxiety was age. Findings on the association of age with POA suggests older patients are more likely to experience POA than younger patients which contradicts study done in Pakistan [21,23]. The age sub-scores of pre-anxieties showed a statistically significant connection of 32.9%. This may be the case due to the correlation between aging and morbidity and mortality. P-value of 0.641 indicates that there is no statistically significant correlation between the information-seeking sub-scores and age which was not in line with study done in Ahi Evran University's faculty of medicine [22].

In contrast to other studies that found patients scheduled for general anesthesia to have statistically higher anxiety scores than patients scheduled for regional anesthesia, the potential reason behind this can be that with regional anesthesia, patients think that they will be awake during the operation and thus will have consciousness of the surroundings. Similarly, general anesthesia can increase the patient anxiety, as the patients think that they will not have control and will be at the mercy of the healthcare staff during the operation [11,22]. on the contrary in our study there was no statistically significant relationship found between the Anxiety sub-score for the type of surgery and anesthesia.

Patients who had previous surgical experience would be less anxious than patients waiting for the first time reported on the study done in Addis Ababa contrary to this, in our study no significant difference was noted which was similar to study at Jimma this difference could because of difference in sample size we didn't encounter a lot of patients with previous history [3,24,25].

Prior to evaluation, the APAIS score for both groups showed higher levels of preoperative anxiety. This is because patients undergoing surgery experienced significant anxiety when facing the unfamiliar environment and the uncertainty brought by the upcoming anesthesia and surgery this is in line with other studies [16,26,27]. Study done in Jimma, teaching hospital indicated that patients who were well informed about the surgical procedure in advance had significantly less preoperative anxiety than those unaware of the procedure which suggest the importance of pre-anesthesia evaluation prior to surgery [3].

Hence the patient's socio-demographic and patient factors such as ASA status, age, sex, and prior anesthetic experience did not significantly differ between the two groups prior to evaluation, we can assume that the evaluation's location contributed to the change in the APAIS score following it. The importance of direct communication and information provision in the alleviation of peri- operative anxiety is well documented [1,6,28,29].

Our findings in comparing anxiety level of patients evaluated at pre-anesthetic clinic to those at the ward showed that patients attending the PAC had higher reduction in POA than ward group which was in line with studies done in Kenya and Switzerland. This may suggest that evaluation performed at PAC plays a great role in reduction of preoperative anxiety thus, it was decided to reject the null hypothesis. This might be because the pre-anesthetic clinic provides a private setting for a more thorough assessment and discussion of anesthesia and surgery [1,9,22]. Our study was able to establish cause and effect relationship between place of anesthesia evaluation and degree of reduction in preoperative anxiety level. Using APAIS as measurement tool allowed us to identify the requirement for information about anesthesia and surgery and additionally to distinguish anxiety about surgery or anesthesia. The assessment of anxiety was performed on the morning just before surgery, which represents the highest level of anxiety on the post test. Our study didn't include pediatric patients and emergency patients because these groups of patients are usually uncooperative which limits generalizability of our finding for the entire population undergoing surgery.

6. Conclusion

Anesthesia evaluation taking place at the pre-anesthesia clinic is more effective in reducing preoperative anxiety. This study also showed that prevalence of anxiety was more than half study population and the level of anxiety was significantly associated with rural residence, and increase in age of patients. As a result, before surgery, patients should receive pertinent information from pre-anesthesia clinics based on their informational needs and we recommend doing pre anesthesia evaluation at the pre anesthesia clinic.

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