

Assessment of Pre-operative Anxiety among Patients undergoing Surgical Dental Procedures under Local Anaesthesia in a Tertiary Care Dental Hospital of Kathmandu, Nepal

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ABSTRACT

Introduction: Pre-operative anxiety is a common psychological response among patients undergoing surgical dental procedures. Anxiety may influence pain perception, cooperation during surgery, and overall treatment outcomes. Limited data are available regarding pre-operative anxiety among dental patients in Nepal.

Objectives: To assess the level of pre-operative anxiety and associated factors among patients undergoing surgical dental procedures under local anaesthesia.

Methods: A descriptive cross-sectional study was conducted among 157 patients undergoing surgical dental procedures under local anaesthesia at Kantipur Dental College and Hospital from June 2024 to November 2024 following ethical approval from the Institutional Review Committee (IRC-KDC; Ref. No. 09/024). Non-probability purposive sampling was applied. Eligible participants were adults aged ≥ 18 years scheduled for periodontal flap surgery, surgical extraction, dental implant placement, or minor oral surgical procedures under local anaesthesia. Anxiety was assessed using the Amsterdam Preoperative Anxiety and Information Scale (APAIS). Data were analysed using SPSS version 24. Chi-square test was used to determine association between preoperative anxiety and independent variables. Statistical significance was set at $p < 0.05$.

Results: Among 157 participants, 77.1% exhibited preoperative anxiety before dental procedures with mean subscale anxiety score (APAIS-A) of 9.5 ± 3.7 and mean subscale information desire score (APAIS-I) of 5.4 ± 2.2 . Previous dental visit ($p=0.007$), fear of pain ($p < 0.001$), fear of complications ($p < 0.001$), and fear of the unknown ($p < 0.001$) were significantly associated with clinically relevant anxiety.

Conclusions: More than two thirds of the study participants undergoing surgical dental procedures under local anaesthesia experienced pre-operative anxiety. Psychological factors, particularly fear-related variables and previous dental history found significant association with preoperative anxiety. Structured patient counselling and targeted anxiety-reducing strategies are recommended in routine periodontal and oral surgical practice.

Keywords: Pre-operative anxiety; APAIS; Surgical dental procedures; local anaesthesia; periodontal flap surgery.

INTRODUCTION

Pre-operative anxiety can be described as a psychological condition characterized by apprehension, fear, and uncertainty prior to any

surgical procedures. Periodontal surgeries, surgical extractions and implant placement are usually associated with intensified anxiety levels due to their invasive and anticipated discomfort.¹ Anxiety can influence intraoperative cooperation, anaesthetic efficacy, post operative pain perception and overall patient satisfaction.² Elevated anxiety levels have been linked with higher perception of pain and poor recovery outcomes.³

Dental anxiety is prevalent worldwide and it is not limited to a population or country despite their age, gender, or education. However, decreased level of

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anxiety is visible among the patients undergoing regular dental treatments.⁴ Various contributing factors for dental anxiety include over expectancy of pain, fear of tooth extraction, complications of dental surgery, fear of local anaesthesia and uncertainty regarding procedures due to lack of knowledge.⁵

Despite its clinical relevance, limited data found in context of Nepal regarding preoperative anxiety among patient undergoing dental surgical procedures. Hence, this study was conducted to assess preoperative anxiety levels and associated factors among patients undergoing surgical dental procedures under local anaesthesia, with the aim of contributing to evidence based, patient centred care in surgical procedures in dentistry.

Methods

A descriptive cross-sectional study was conducted in the Department of Periodontology and Oral Implantology and the Department of Oral and Maxillofacial Surgery at Kantipur Dental College and Hospital for the period of six months (June 2024 to November 2024) following ethical approval from the Institutional Review Committee (IRC-KDC; Ref. No. 09/024). This study included the patient of age ≥ 18 years who have taken appointment for surgical dental procedures under local anaesthesia like periodontal flap surgery, surgical extractions, implant placement, or minor surgical procedures (gingival curettage, gingivectomy, gingival depigmentations, frenotomy and frenectomy). Patients with diagnosed psychiatric illness or under anxiolytic medications were excluded from this study.

Sample size was calculated using data from the study of using formula (MaiteBovaira)⁶

$$\begin{aligned} n &= z^2(p q)/e^2 \\ &= (1.96)^2 \times (72.2/100) \times (1-0.72)/ (0.07)^2 \\ &= 157 \end{aligned}$$

where,

n = required sample size

z= confidence level of 95%

p= estimate proportion of an attribute present in a given population

q= 1-p

e= error of margin 7% or 0.07

Non-probability purposing sampling technique was used to collect the data and written informed consent from the research participants were taken by primary and co-investigator. Pre-operative anxiety was assessed using the Amsterdam Preoperative Anxiety and Information Scale (APAIS), which uses a validated six item questionnaire measuring anxiety related to anaesthesia and anxiety related to surgery (anxiety subscale with items 1,2,4,5), desire for information (information need subscale with items 3,6). Higher scores indicate higher anxiety and information need. The anxiety subscale (APAIS-A) score of ≥ 11 was considered as clinically relevant anxiety while the total information need subscale (APAIS-I) of ≥ 8 was considered as high information need. Patients with total scale score of ≥ 11 was considered to have preoperative anxiety due to dental procedures.⁶

The APAIS scoring include as illustrated in table.⁷

1	I am worried about the anaesthetic
2	The anaesthesia is on my mind continually
3	I would like to know as much as possible about the anaesthetic
4	I am worried about the procedure
5	The procedure is on my mind continually
6	I would like to know as much as possible about the procedure

The measure of agreement with these statements were graded on a five-point Likert scale from 1 = not at all to 5 extremely.

The patient who demonstrated extreme preoperative anxiety as defined by APAIS were managed using multi-tiered protocol consisting of both non-pharmacological interventions like providing verbal explanations procedure. Psychological support was given by permitting one of the family members to remain at chairside and was referred to department of medicine for pharmacological management.

To protect participant privacy, we removed all

personal identifiers (such as name, date of birth, contact information) from research data set. We replaced these details with unique identification codes. We stored all electronic data on secured, password protected device. Physical records, including signed consent forms were kept safe and after study ends these will be permanently destroyed.

Thes data were entered into Microsoft Excel and analysed using SPSS version 24. Descriptive statistics were expressed as mean, standard deviation, frequency, and percentage. Chi- square test was used to determine associations. P value < 0.05 was considered statistically significant.

RESULTS

Table 1 shows that a total of 157 participants were included in the study. The sociodemographic profile showed that the majority were between 31–45 years of age (36.3%), followed by 18–30 years (33.1%). More than half of the participants were male (54.1%), and most were married (62.4%). Educational attainment was high, with nearly twothirds (63.7%) having higher education, while only 1.3% were illiterate. In terms of occupation, over half were job holders (53.5%), followed by students (21.6%), others (16.5%), and businessmen (8.3%).

Table 1: Socio-demographic profile of the study participants. (n = 157)

Characteristics	Categories	Count (n)	Percent (%)
Age (in years)	18 – 30	52	33.1
	31 – 45	57	36.3
	46 – 60	39	24.8
	≥ 61	09	5.7
Sex	Male	85	54.1
	Female	72	45.9
Marital Status	Single	56	35.7
	Married	98	62.4
	Divorced	03	1.8
Educational level	Illiterate	02	1.3
	Primary school	10	6.4
	Secondary school	45	28.7
	Higher education	100	63.7
Occupation	Student	34	21.6
	Businessman	13	8.28
	Job holder	84	53.5
	Others	26	16.5

Table 2: Clinical and habit history of study participants. (n = 157)

Characteristics	Categories	Count (n)	Percent (%)
Past dental history	First visit	65	41.4
	Dental procedure under anaesthesia	86	54.8
	Dental trauma	06	3.8
Medical history	Not significant	115	73.2
	Presence of systemic disease	42	26.7
Current tobacco smoker	No	141	89.8
	Yes	16	10.2
Current alcoholUser	No	118	75.2
	Yes	39	24.8

Clinical and habit history revealed that 54.8% of participants had undergone previous dental procedures under anaesthesia, while 41.4% were attending their first dental visit. Only 3.8% reported a history of dental trauma. Most participants (73.2%)

had no significant medical conditions, while 26.7% reported systemic disease. Lifestyle habits showed that 10.2% were current tobacco smokers and 24.8% consumed alcohol. (Table 2)

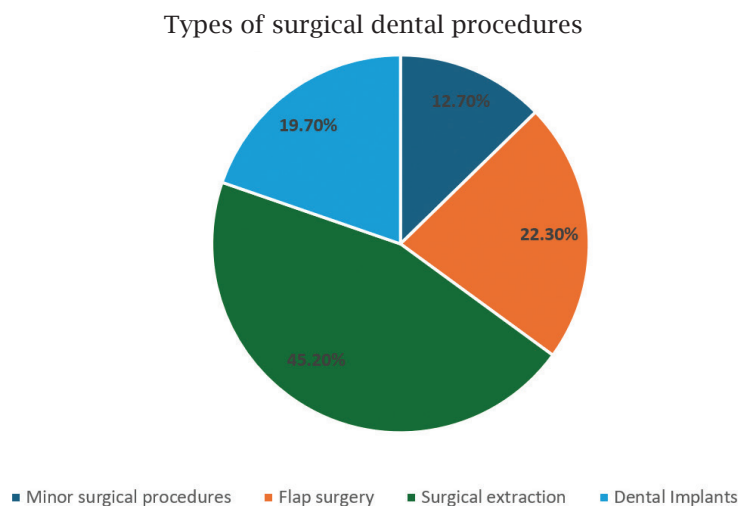


Figure 1: Type of surgical dental procedures performed for the study participants. (n = 157)

Figure 1 illustrates the distribution of surgical dental procedures performed among the study participants. The majority underwent routine procedures such as surgical extractions (45.2%) and minor oral surgeries, while more complex interventions were less frequent.

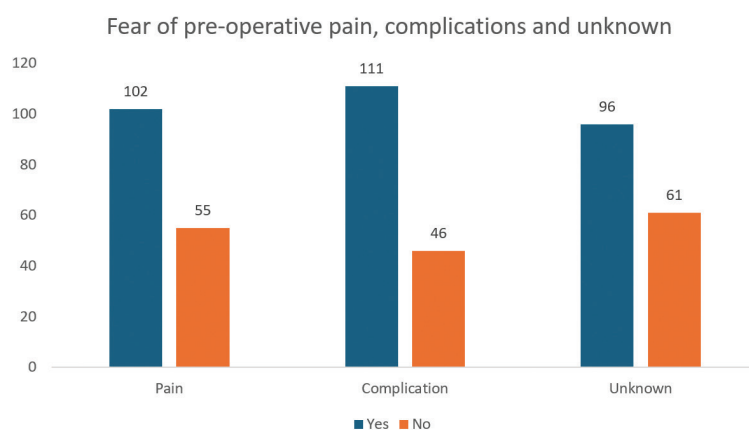


Figure 2: Fear of pre-operative pain, complication and of unknown among the study participants.

Figure 2 highlights participants' psychological concerns prior to surgery. A considerable proportion reported fear of preoperative pain, potential complications, and uncertainty about the procedure, indicating that anxiety related to dental surgery was common.

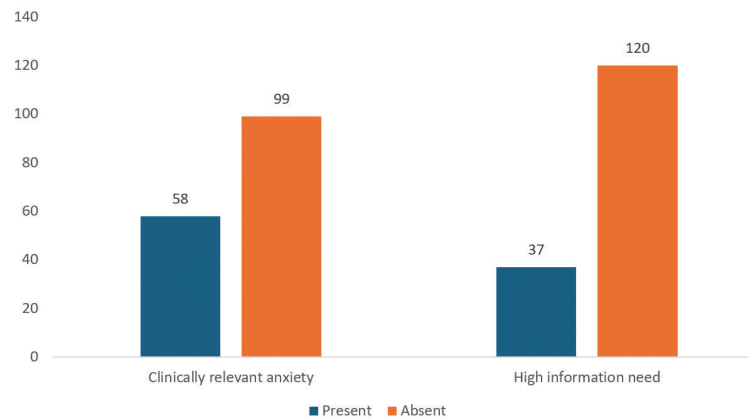


Figure 3: Proportional distribution of study participants with clinically relevant anxiety and high information need. (n = 157)

Figure 3 shows the proportional distribution of participants with clinically relevant anxiety and a high need for information. A notable share of individuals expressed both clinically relevant anxiety (36.9%) and high information need (23.5%).

Table 3: Assessment of level of anxiety and need for information about surgery among study participants through APAIS. (n = 157)

Questions of the scale	Almost always (n, %)	Sometimes (n, %)	Every once in a while (n, %)	Rarely (n, %)	Never (n, %)
Anxiety related to Anaesthesia					
I am worried about the anaesthetic.	2 (1.2%)	17 (10.8%)	42 (26.7%)	70 (44.6%)	26 (16.6%)
The anaesthetic is on my mind continually.	1(0.6%)	19 (12.1%)	33 (21.0%)	56 (35.6%)	48 (30.5%)
Anxiety related to surgery					
I am worried about the procedure.	8 (5.1%)	18 (11.5%)	48 (30.6%)	54 (34.4%)	29 (18.5%)
The procedure is on my mind continually.	9 (5.7%)	20 (12.7%)	40 (25.5%)	56 (35.7%)	32 (20.4%)
Desire for information about anaesthetic and surgery					
I would like to know as much as possible about the anaesthetic.	9 (5.7%)	28 (17.8%)	45 (28.6%)	49 (31.2%)	26 (16.5%)
I would like to know as much as possible about the procedure.	17 (10.8%)	27 (17.2%)	40 (25.5%)	45 (28.6%)	28 (17.8%)

Assessment of anxiety and information needs using the APAIS scale (Table 3) revealed that most participants reported low levels of worry regarding anaesthesia and surgery. Only a small proportion indicated being “almost always” worried ($\leq 6\%$), while

the majority responded “rarely” or “never.” However, a notable share expressed a desire for information, with 10.8% wanting to know “as much as possible” about the procedure and 5.7% about anaesthesia.

Table 4: Summary statistics of the overall APAIS score and its domains. (n = 157)

APAIS scores	Mean $\pm$ SD	Lower – Upper
Total anxiety score (APAIS-A)	9.5 $\pm$ 3.7	4 – 19
Information score (APAIS-I)	5.4 $\pm$ 2.2	2 – 10
Overall score (APAIS)	14.9 $\pm$ 5.3	6-28

Table 5: Association of clinically relevant anxiety with socio-demographic variables. (n = 157)

Variables	Categories	Pre-operative dental anxiety		Chi-square value	P value
		Present	Absent		
Age	18 – 30	45(86.5%)	07(13.5%)	6.352	0.096
	31 – 45	44 (77.2%)	13(22.8%)		
	46 – 60	27 (69.2%)	12 (30.8%)		
	$\geq$ 61	05 (55.5%)	04 (44.4%)		
Sex	Male	62 (72.9 %)	23 (27.1%)	1.788	0.181
	Female	59 (81.9 %)	42 (18.1%)		
Marital status	Single	46 (82.1%)	10 (17.9%)	-----	----
	Married	73 (73.7%)	26 (26.2%)		
	Divorced	02 (100 %)	0 (0%)		
Education	Illiterate	02	02	----	----
	Primary school	04	06		
	Secondary school	14	31		
	Higher education	35	65		
Occupation	Student	28 (80%)	7 (20%)	3.079	0.380
	Businessman	12 (92.3%)	1 (7.7 %)		
	Job holder	64 (76.2%)	20 (23.8%)		
	Others	17 (68.0%)	8 (32%)		

Summary statistics of APAIS scores (Table 4) showed a mean total anxiety score (APAISA) of 9.5 ± 3.7 , an information need score (APAISI) of 5.4 ± 2.2 , and an overall APAIS score of 14.9 ± 5.3 with more than two thirds (77.1%) exhibiting pre-operative anxiety.

The association of clinically relevant anxiety with sociodemographic variables (Table 5) demonstrated that younger participants (18-30 years) and females tended to report higher anxiety, though these

differences did not reach statistical significance ($p > 0.05$). Similarly, other socio demographic variables did not show significant association with preoperative anxiety.

Analysis of personal history variables (Table 6) revealed that positive medical history, tobacco use, and alcohol consumption were not significantly associated with anxiety. Alternative, past dental history, fear of pain, fear of complications, and

Table 6: Association of clinically relevant anxiety with personal variables. (n = 157)

Variables	Categories	Preoperative dental anxiety		Chi-square value	P value
		Present	Absent		
Past dental history	First visit	57 (87.6%)	8 (12.3%)	9.854	0.007*
	Procedure under anaesthesia	59 (67.8%)	28 (32.2%)		
	Dental trauma	03 (60%)	02(40%)		
Medical history	Not significant	89 (77.4 %)	26 (22.6%)	0.025	0.874
	Presence of systemic disease	32 (76.2%)	10 (23.8%)		
Current tobacco smoker	No	109 (77.3)	32 (22.7%)	0.043	0.835
	Yes	12 (75.0 %)	04 (25.0%)		
Current alcohol User	No	92 (77.9%)	26 (22.1%)	0.216	0.642
	Yes	29 (74.4%)	10 (25.6%)		
Fear of pain	No	27(49.1%)	28 (50.9%)	37.50	<0.001*
	Yes	94 (92.2%)	08 (7.8 %)		
Fear of complications	No	19 (41.3%)	27 (58.6%)	47.09	<0.001*
	Yes	102(91.8%)	09 (8.11%)		
Fear of unknown	No	35(57.3%)	26 (42.6%)	21.892	<0.001*
	Yes	86(89.5%)	10 (10.5%)		

*Statistically significant

fear of the unknown were strongly associated with clinically relevant anxiety, with highly significant p values (<0.001). Participants reporting these fears along with previous dental visit were more likely to exhibit preoperative anxiety compared to their counterpart.

DISCUSSION

This study evaluated preoperative anxiety among patients undergoing surgical dental procedures under local anaesthesia and found that more than two thirds (77.1%) of patients exhibited preoperative anxiety before dental procedures.

In the current study, the overall mean scale score was 14.9 ± 5.3 which is comparatively higher compared with the previously reported study by Devapriya et al. in 2015⁸, where the mean score of dental anxiety was 10.4 ± 3.9 . The possible explanation could be negative past dental experience, previous invasive procedures. The clinical setting and timing of assessment could have influenced assessment of anxiety as well.

Although younger individuals (18-30 years) and females exhibited higher anxiety levels, the lack of

statistical significance suggests that demographic factors alone may not be strong predictors of anxiety. Similarly, marital status and occupation showed no significant associations with anxiety levels. Similar trends have been reported in the study by González-Lemonnier S. in 2010, where female and younger individuals reported higher preoperative anxiety levels, the but the differences being statistically significant $p=0.01$.⁹ Difference in anxiety level in female than in male individuals maybe explained via psychological literature, where they found that females are more expressive to fear than their counter part and males are more likely to lie about their feeling of anxiety .¹⁰ However, the lack of statistical significance in this study suggests that demographic variables alone may not independently predict anxiety in surgical dental patients. This finding reinforces the multifactorial nature of pre-operative anxiety.

In the current study, systemic medical conditions, smoking status, and alcohol consumption were not found to be significant with anxiety levels while past dental history was associated with presence of preoperative anxiety. This is in concurrence with a systemic review and meta-analysis by C.S Lin which found subsequent visits in dental office to have

significant impact on expected pain and anxiety level.⁵ Patient often recall unpleasant sensations from earlier treatments, anticipation of pain may also increase with each visit, if previous experiences were negative highlighting cumulative pattern of dental anxiety.

The strong association and significance were found between anxiety and fear of pain, fear of complications, and fear of the unknown ($p < 0.001$) in this study. Volunteers who shared the fear of pain were significantly more likely to exhibit clinically relevant anxiety. These finding align with the finding of meta-analysis, where they demonstrated bidirectional relationship between anxiety and pain perception. This suggested that anxiety amplifies perceived pain intensity, while anticipated pain increases anxiety, creating a cyclical relationship.⁵

Fear of complications and fear of unknown or uncertainty due to surgical procedures, even minor ones, may be perceived as unpredictable or risky and lack of clarity regarding postoperative outcomes may heighten emotional distress. This fear is another significant predictor in our study. This is consistent with the study done by Wondmienieh in 2020, where they found high level anxiety due to fear of the long-term consequences of the surgery.¹¹ Hence, reinforces our finding that uncertainty about surgical outcomes can play a role in preoperative anxiety. Thus, the importance of effective complication and patient education preoperative is emphasized. The moderate information desire score (5.4 ± 2.2) indicates that many patients attempt to find additional procedural details. Bovaira M in 2017 suggested that adequate pre-operative information reduces uncertainty and improves psychological preparedness. Structured explanation of procedure steps, expected sensations, duration, and postoperative recovery may significantly alleviate anxiety.⁶ However, the relationship between information delivery and anxiety is interrelated. While providing appropriate information can lower anxiety, overloading patients with information or communicating it poorly may in turn amplify their apprehension.¹²

From periodontal perspective, anxiety management is important because periodontal surgeries often involve visible bleeding and prolong chairside time. Implant surgery requires patient cooperation and

precision. Anxiety may affect local anaesthetic efficacy and haemodynamic stability. This anticipated fear of pain ($p < 0.001$) induces an autonomic stress response that can compromise local anaesthesia efficacy, elevated blood pressure and increased intraoperative bleeding.¹ Such hemodynamic instability obscures the surgical field and reduces a clinician's tactile precision during delicate tissue manipulation, ultimately leading to higher pain perception, reduced treatment satisfaction, poor postoperative healing.³ Thus, incorporating screening tools like APAIS may help clinicians identify high-risk individuals.¹ Once flagged for high anxiety level, Clinician can provide balanced structured preoperative counselling to satisfy patient's desire of information, behavioural reassurance, relaxation techniques, audio-visual distraction, structural communication protocols may help to improve patient comfort and surgical outcomes.⁶

Present study has several limitations which should be considered when interpreting the findings such as, this study was done in single centre which limits its generalisability and non-probability sampling may introduce selection bias. APAIS has not been formally validated in Nepalese population, therefore, cultural and linguistic differences may have influenced participant's responses, hence future studies should focus on cultural adaptations and psychometric validation in Nepal.

CONCLUSION

In conclusion, the substantial proportion of patients undergoing surgical dental procedures under local anaesthesia experience clinically significant levels of anxiety, with more than two-thirds of the study population being affected. These findings indicate important role of psychological factors, particularly fear of pain, potential complications, and uncertainty regarding treatment outcomes along with past dental history, as key factors associated with preoperative anxiety. These factors not only influence patient's emotional well-being but may also impact their cooperation during procedures and overall treatment experience. Therefore, a patient-centred approach that addresses both the psychological and clinical aspects of care is essential in the effective management of preoperative dental anxiety.

CONFLICT OF INTEREST: None.

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