ORIGINAL ARTICLE

Relationship between Preoperative Anxiety and Postoperative Pain among Patients undergoing Elective Surgery in Tertiary Care Center

Seema Subedi[1], Sanjesh Shrestha[2]

[1] Nepal Armed Police Force Hospital, Balambu, Kathmandu, Nepal
[2] Department of Psychology, Tribhuvan University, Kathmandu, Nepal

Corresponding Author:
Ms. Seema Subedi
Department of Nursing
Nepal Armed Police Force Hospital
Balambu, Kathmandu, Nepal.
Email: seemasubedi10@gmail.com

Article History:
Received date: July 11, 2025
Revised date: July 28, 2025
Accepted date: August 01, 2025
Published date: August 28, 2025

Online Access
DOI:10.64772/mjapfn113

Abstract

Introduction: Appropriate postoperative pain management benefits patients by reducing postoperative cognitive impairment, improving quality of life, and lowering the risk of chronic postsurgical pain. The objective of this research was to explore the relation between anxiety before surgery and pain experienced after surgery in patients undergoing elective procedures.

Methods: This descriptive cross-sectional study was conducted among patients undergoing elective surgery. Data were collected via self-administered standard semi-structured questionnaires (Amsterdam Preoperative Anxiety and Numerical Pain Rating scale). Descriptive statistics including frequency, percentage, and mean were used for data analysis. Chi-square test and logistic regression were performed to identify associations between preoperative anxiety and socio demographic variables.

Results: Out of 109 respondents, 86(78.90%) had preoperative anxiety. There was a significant correlation between preoperative anxiety and the level of postoperative pain experienced two hours after surgery. Similarly, a significant relationship was also found between age and type of anesthesia during the 6 hour and 24 hour postoperative periods respectively.

Conclusions: The study revealed that most patients reported experiencing anxiety before surgery, and a connection was identified between this preoperative anxiety and the level of pain experienced after the operation. It showed that preoperative anxiety had a significant relationship in the immediate postoperative period. Further dimensions like preoperative medications, postoperative medications and care could be added to make the study more effective.

Keywords: *pain; postoperative; preoperative; surgery.*

Introduction

Preoperative anxiety is the term used to describe a patient's unpleasant state of worry before surgery. It usually has to do with how one feels about the impending surgery or anesthetic, discomfort, staying in a hospital, and the illness itself.[1] Research indicates that the occurrence of preoperative anxiety in Western populations varies between 12.60% and 76.70%, while in Nepal, the rates fall between 22.85% and 58.50%.[2,3,4] Postoperative pain is a common outcome following any surgical procedure. Effective management of postoperative pain leads to long-term benefits for patients, including reduced risk of

How to cite (Vancouver Style)
Subedi S, Shrestha S. Relationship between Preoperative Anxiety and Postoperative Pain among Patients undergoing Elective Surgery in Tertiary Care Center. Med J APF Nepal. 2025;1(1):11-16.

cognitive impairment after surgery, enhanced quality of life, and a decreased likelihood of developing chronic or persistent postsurgical pain.[5]

This study helps in the knowledge building related to the preoperative anxiety and its relationship with the postoperative pain. It helps us to identify the anxiety among the different surgical procedures and different anesthesia which gives us knowledge on the need of more counselling and preparation on specific procedures. Similarly it provides information on the level of pain among patients after surgery which is also an important factor which gives us information on how the pain management is adequate or not. It guides the concerned authorities to re-evaluate their pain management strategies. The objective of this study was to identify the relationship between preoperative anxiety and postoperative pain.

Methods

This is a descriptive cross-sectional study which was conducted among patients undergoing elective surgery in the surgical ward of Nepal APF Hospital from July to September 2024. Ethical clearance was obtained from the Institutional Review Committee (Reference number: NAPFH-006/2024). Ex post facto research design was used. A purposive non-probability sampling method was employed in this study. As the study was conducted in a single setting and only specific participants i.e. preoperative patients were included in this study, this sample design was used.

Inclusion criteria: Patients scheduled for elective surgery

Exclusion criteria:

- Patients aged less than 18 years
- Patients with known cognitive or psychological impairment
- Emergency operative patients and minor surgeries
- Patients unable to understand Nepali language

Sampling method and sample size calculation:
Non-probability purposive sampling was employed to select preoperative patients in a single setting. The size of the sample was determined by applying Cochran's formula.[6]

$n= Z^2 pq/e^2$

$= (1.96^2*0.22*0.77)/0.05^2$

$= 261$

Where;

n= sample size

Z= 1.96 at 95% confidence interval

p= prevalence from previous study (Prevalence of preoperative anxiety in above mentioned study done in Nepal is 22.85%)[3]

q= 1-p = 0.77

e= standard error (taking 5%)

Adding 10% non response rate, the total sample size becomes

N=261

Using the finite population correction,

N=150

Adjusted sample size = n*N/(n +(N-1))

= 261*150/(261+(150-1)

= 39150 /261+149

= 39150/410 = 95

Adding 10% non-response rate, the final required sample size was 105. As it was minimum required sample size, a total of 109 participants were included during data collection.

Data Collection Tool:
Data were collected using three tools:

Part I: A self-developed semi-structured questionnaire on socio-demographic characteristics (e.g., sex, marital status, type of anesthesia, previous surgery).

Part II: The Amsterdam Preoperative Anxiety and Information Scale (APAIS), developed by Nelly Moerman in 1996, containing six items rated on a five-point Likert scale from "not at all" to "extremely." The anxiety subscale score ranges from 4 to 20; scores ≥11 indicated anxiety. Information needs were categorized as no/little (2–4), average (5–7), or high (8–10).[7] Reliability of the anxiety scale (Cronbach's alpha = 0.79) and information scale (Cronbach's alpha = 0.77) were established in a Nepali validation study. The APAIS was translated into Nepali and back-translated to English.[8]

Part III: The Numerical Pain Rating Scale (NRS) developed by Downie in 1978, ranging from 0 (no pain) to 10 (worst pain). Pain levels were classified as mild (1–3), moderate (4–6), and severe (7–10). Earlier research indicated high inter-rater reliability for the NRS, showing an ICC of 0.929 (95% CI: 0.712–0.982).[9]

Content validity of all instruments was established through a comprehensive literature review, guidance from research advisors, and input from subject matter experts

Data collection procedure:
Data collection procedure involved obtaining permission from the IRC of the hospital. After taking permission from the concerned authority, an informed written consent was obtained from each respondent and they were explained about the purpose of the study. Data collection was carried out in two separate phases. Firstly, preoperative anxiety was noted on the day before surgery and postoperative pain was collected after surgery in different time periods. Data were collected through self-administered questionnaires and interviews. The researcher personally distributed the questionnaires, conducted the interviews, and collected.

Data entry and statistical analysis:
Data were checked for completeness, coded, and entered in Statistical Package for the Social Sciences version 25. The normality of data distribution was assessed. Point estimates at 95% Confidence Interval were calculated along with frequency and percentages for binary data, and mean and standard deviation for continuous data. Chi-square test and logistic regression were used to assess associations.

Results

Preoperative anxiety was divided into not anxious and anxious according to cut off score provided by the APAIS scale. 78.90% of the patients were found to be anxious and 21.10% of them were not anxious (Table 1).

Table 1: Preoperative Anxiety (n=109).

Preoperative Anxiety	Not Anxious n(%)	Anxious n(%)
	23(21.10)	86(78.90)

It revealed that 25.70%, 19.30%, 39.40%, 52.30%, 62.40% had mild level of pain and 74.30%, 80.70%, 60.60%, 47.70% and 37.60% of the participants had moderate and severe pain at 2, 4, 6, 12 and 24 hours of postoperative period respectively. This showed that the highest level of pain is seen at 4 hours of postoperative period followed by 2, 6, 12 and 24 hours(Table 2).

Table 2: Pain scoring at different postoperative hours (n=109).

Pain scoring at	Mild n(%)	Moderate and Severe n(%)
2 hours	28(25.70)	81(74.30)
4 hours	21(19.30)	88(80.70)
6 hours	43(39.40)	66(60.60)
12 hours	57(52.30)	52(47.70)
24 hours	68(62.40)	41(37.60)

In 2 hour period of postoperative time, majority of the patients who were anxious had moderate and severe pain. Preoperative anxiety and pain were seen to be significantly associated with each other at 2 hour of postoperative time(Table 3).

Table 3: Relationship between Preoperative anxiety and Postoperative Pain at various hours of postoperative time (n=109).

Postoperative Time	Preoperative Anxiety	Pain		x^2	df	p-value
		Mild	Moderate and Severe			
2 hours	Not Anxious	12(52.20)	11(47.80)	10.713	1	0.01*
	Anxious	16(18.60)	70(81.40)			
4 hours	Not Anxious	6(26.10)	17(73.90)	0.872	1	0.350
	Anxious	15(17.40)	71(82.60)			
6 hours	Not Anxious	11(47.80)	12(52.20)	0.856	1	0.355
	Anxious	32(37.20)	54(62.80)			
12 hours	Not Anxious	11(47.80)	12(52.20)	0.233	1	0.629
	Anxious	46(53.50)	40(46.50)			
24 hours	Not Anxious	18(78.30)	5(21.70)	3.131	1	0.07
	Anxious	50(58.10)	36(41.90ss)			

*Statistical significance

Age and Type of anesthesia was found to be significant with postoperative pain at 6 and 24 hours of postoperative period respectively. No significance was seen among other variables (Table 4 and 5).

Table 4: Relationship between postoperative pain and selected socio demographic variables at 6 hour of postoperative time (n=109).

Variables	Crude OR	95% CI for COR (Lower-Upper)	p-value
Age Less than 40 More than 40	0.36	0.15-0.91	0.029*
Comorbidities Yes No	0.74	0.31-1.72	0.494
Type of Anesthesia General Spinal	0.93	0.42-2.03	0.939

*Statistical significance, OR= Odd Ratio
CI= Confidence Interval

Table 5: Relationship between postoperative pain and selected socio demographic variables at 24 hours of postoperative time(n=109).

Variables	Crude OR	95% CI for COR (Lower-Upper)	p-value
Age Less than 40 More than 40	1	0.41-2.47	0.99
Comorbidities Yes No	0.77	0.32-1.85	0.56
Type of Anesthesia General Spinal	2.53	1.11-5.76	0.026*

*Statistical significance, OR= Odd Ratio
CI= Confidence Interval

Discussion

Preoperative Anxiety

The study revealed that the preoperative anxiety was present among 78.90% of the patients undergoing surgery. The findings were consistent with those from other research, including a study conducted in Sri Lanka involving patients undergoing elective surgery, which reported rates of 76.70% and 82.40% in a study evaluating the impact of gender and the type of anesthesia on anxiety related to day surgery.[10,11] In context to Nepal, a study done in patients awaiting cardiac surgery, the preoperative anxiety was found to be 58.50% which is also in line with our findings.[4] To the contrary, similar studies conducted in Nepal in different settings showed the presence of preoperative anxiety among 22.85% and 31% of patients.[3,12] These differences in the prevalence of the preoperative anxiety among various preoperative groups could be due to the differences in the sample size, sampling techniques, study settings, type of surgery and anesthesia. Most patients in Nepal's hospitals are from lower middle class and families with limited resources. Due to social barriers and the respect shown toward doctors, patients usually hesitate from asking questions afterward. As a result, concerns regarding anesthesia and surgery are dismissed. Furthermore, there aren't many patient forums and patients based support groups for talking about the problems associated with their operative anxiety.

Postoperative Pain

The study revealed that the pain started to decrease with the increase in postoperative period. Patients in immediate postoperative time complained of moderate and severe pain but as the time passed on, the pain scoring in mild section increased and decreased in the moderate and severe section. A study showed that total of 72% of patients reported moderate pain following surgery, indicating that the acute postoperative pain among patients undergoing laparoscopic hysterectomy has not been adequately managed.[13] This finding goes along with the studies done among postoperative patients who also showed presence of severe pain in the immediate postoperative period.[2,14,15]

Preoperative anxiety and Information Requirement

In regards to the need for information, the study showed that 71.60% of the patients had high information requirement with the higher need among the anxious patients. This result goes along with the study done among patients undergoing foot nails surgery where more information requirement was 43.90% among preoperative patients and greater among patients with anxiety.[16] This study demonstrated a significant association between preoperative anxiety and the need for information. This concurs with the study which showed that patients with higher level of anxiety also had a higher interest in getting information related to the surgery Ahmed et al.[4] found that even after watching an educational video about cataract surgery, a high portion of patient still required additional information.[17] The findings showed that nearly half of the patients (49.27%) had a moderate need for information, while 15.61% experienced a significant need for information. A positive relationship was observed between anxiety scores and scores on the information scale.[18]

Preoperative anxiety and Postoperative pain

This study showed a significant relationship between preoperative anxiety and postoperative pain at 2hours of postoperative period but no relationship at [4,6,12] and 24 hours. This is in line with the study done in Yale-New Haven Hospital which demonstrated that preoperative state anxiety is a significant positive predictor of the immediate postoperative pain.[14] This study has also shown significant relationship with the immediate postoperative pain. Going along with these findings is another study, done in Dilla University Hospital, which also showed a significant relationship at 2 hours of postoperative period, but it also showed relationship at other periods of time i.e. 4, 6 and 12 hours.[2] Likewise, another study done under patients undergoing laparoscopic sleeve gastrectomy, revealed a correlation between preoperative anxiety and pain at 24 hours of postoperative period.[19] Similarly, a positive correlation was seen between state anxiety and postoperative pain among patients going through tonsillectomy.[13] Keeping in line with the above results, another study done among patients undergoing foot nail surgery, there showed an existence of relationship between preoperative anxiety and postoperative pain.[15] A study showed that there is no difference between male and female in the preoperative anxiety and postoperative pain.[20] This goes along with our findings too.

Due to single setting design, small sample size the results cannot be generalized over a large population and due to the nature of the study, the confounding variables like preoperative medications, operative differences and analgesics were not controlled.

Conclusions

In the light of the results of the present study, it can be concluded that preoperative patients had higher anxiety levels and it had a relationship with postoperative pain. It showed that preoperative anxiety had a significant relationship in the immediate postoperative period. Further dimensions like preoperative medications, postoperative medications and care could be added to make the study more effective. Similarly, study of preoperative anxiety and pain among single operative procedure could be effective for the development of specific strategies and programs. The use of analgesics and pain controlled measures can also be included in the study for more specific results. Further dimensions like preoperative medications, postoperative medications and care could be added to make the study more effective.

Source of Funding: None

Acknowledgement

Tool developer of APAIS, Padmakanya Multiple Campus, Department of Psychology

Conflict of Interest

The authors declare no competing interest. Seema Subedi is currently serving as Editor of Medical Journal of Armed Police Force Nepal (MJAPFN). She was not involved in the editorial review or decision-making for this manuscript.

Author's Contribution and ORCID iDs

Seema Subedi
Conceptualization, Methodology, Literature review, Data analysis, Drafting.

: https://orcid.org/0009-0008-9078-4414

Sanjesh Shrestha
Conceptualization, Data analysis, drafting the Manuscript

: https://orcid.org/0009-0001-6656-8278

References

1. Jovanovic K, Kalezic N, Sipetic Grujicic S, Milic N, Sabovljev M, Jovanovic M, et al. Translation and Validation of the Amsterdam Preoperative Anxiety and Information Scale (APAIS) in Serbia. Brain Behav. 2021 Dec;11(12):e2462. DOI: 10.1002/brb3.2462
2. Tadesse M, Ahmed S, Regassa T, Melkie M, Fentie K. Effect of Preoperative Anxiety on Postoperative Pain on Patients Undergoing Elective Surgery: Prospective Cohort Study. Ann Med Surg. 2022 Mar;73:103190. DOI: 10.1016/j.amsu.2021.103190
3. Lakhe G, Shrestha BB, Subedi A. Preoperative Anxiety Among Patients Undergoing Elective Surgery in a Tertiary Care Centre: A Descriptive Cross-Sectional Study. J Nepal Med Assoc. 2022 Mar;60(247):681-4. DOI: 10.31729/jnma.7636
4. Sigdel S, Ozaki A, Basnet M, Pradhan B, Marahatta SB. Anxiety Evaluation in Nepalese Adult Patients Awaiting Cardiac Surgery. Medicine. 2020 Feb;99(7):e19302. DOI: 10.1097/md.0000000000019302
5. Pogatzki-Zahn EM, Zahn PK, Brennan TJ. Postoperative Pain-Clinical Implications of Basic Research. Best Pract Res Clin Anaesthesiol. 2007 Mar;21(1):3-13. DOI: 10.1016/j.bpa.2006.11.003

6. Charan J, Biswas T. How to Calculate Sample Size for Different Study Designs in Medical Research? Indian J Psychol Med. 2013 Apr;35(2):121-6. DOI: 10.4103/0253-7176.116232
7. Boker A, Brownell L, Donen N. The Amsterdam Preoperative Anxiety and Information Scale (APAIS)-The First Trial of a German Version. Psychosom Med. 2007 Sep;69(7):677-82. Available from: https://pubmed.ncbi.nlm.nih.gov/19742298/
8. Pokharel K, Bhattarai B, Tripathi M, Khatiwada S, Subedi A. Nepalese Patients' Anxiety and Concerns Before Surgery. J Clin Anesth. 2011 Aug;23(5):372-8. DOI: 10.1016/j.jclinane.2010.12.011
9. Fauziyah LN, Sari DRK. Inter Rater Reliability the Numeric Rating Scale in Individuals With Knee Osteoarthritis. In: Proceedings of the Annual Scientific Conference. 2021. Available from: https://proceedings.ums.ac.id/apc/article/view/121
10. Matthias AT, Samarasekera DN. Preoperative Anxiety in Surgical Patients-Experience of a Single Unit. Acta Anaesthesiol Taiwan. 2012 Mar;50(1):3-6. DOI: 10.1016/j.aat.2012.02.004
11. Mitchell M. Influence of Gender and Anesthesia Type on Day Surgery Anxiety. J Adv Nurs. 2011 May;68(5):1014-25. DOI: 10.1111/j.1365-2648.2011.05801.x
12. Hyoju SP. Prevalence of Preoperative Anxiety in Preoperative Patients in Nepal Police Hospital: A Cross-Sectional Descriptive Study. Nepal Med J. 2021 Dec;4(2):85-8. Available from: https://nmj.com.np/nmj/index.php/nmj/article/view/18
13. Zhang L, Hao LJ, Hou XL, Wu YL, Jing LS, Sun RN. Preoperative Anxiety and Postoperative Pain in Patients With Laparoscopic Hysterectomy. Front Psychol. 2021 Jun;12:727250. DOI: 10.3389/fpsyg.2021.727250
14. Aydogdu I, Yavuz ATRA M, Ziya Salturk M, Aydogdu Z, Okan Parmaksiz M. Preoperative Anxiety and Postoperative Pain Levels in Patients Undergoing Tonsillectomy. KBB Forum. 2019. Available from: https://kbb-forum.net/journal/uploads/pdf/pdf_KBB_454.pdf
15. Kain ZN, Sevarino F, Alexander GM, Pincus S, Mayes LC. Preoperative Anxiety and Postoperative Pain in Women Undergoing Hysterectomy. J Psychosom Res. 2000 Nov;49(5):417-22. DOI: 10.1016/s0022-3999(00)00189-6
16. Navarro-Gastón D, Munuera-Martínez PV. Prevalence of Preoperative Anxiety and Its Relationship With Postoperative Pain in Foot Nail Surgery: A Cross-Sectional Study. Int J Environ Res Public Health. 2020 Jun;17(12):4481. DOI: 10.3390/ijerph17124481
17. Ahmed KJ, Pilling JD, Ahmed K, Buchan J. Effect of a Patient-Information Video on the Preoperative Anxiety Levels of Cataract Surgery Patients. J Cataract Refract Surg. 2019 Apr;45(4):475-9. DOI: 10.1016/j.jcrs.2018.11.011
18. Adhikari SP, Pathak BD, Ghimire B, Baniya S, Joshi P, Kafle P, et al. Prevalence of Pre-Operative Anxiety and Associated Risk Factors Among Patients Awaiting Elective Surgery in a Tertiary Care Hospital. F1000Res. 2023 Dec;12:1207. DOI: 10.12688/f1000research.136320.2
19. Pekcan YO, Tuncalı B, Erol V. Effect of Preoperative Anxiety Level on Postoperative Pain, Analgesic Consumption in Patients Undergoing Laparoscopic Sleeve Gastrectomy: An Observational Cohort Study. Braz J Anesthesiol (Engl Ed). 2021 Nov;73(1):85-90. DOI: 10.1016/j.bjane.2021.11.003
20. Fernández Castro M, Jiménez JM, Martín-Gil B, Muñoz-Moreno MF, Martín-Santos AB, Del Río-García I, et al. The Influence of Preoperative Anxiety on Postoperative Pain in Patients Undergoing Cardiac Surgery. Sci Rep. 2022 Oct;12(1):16468. DOI: 10.1038/s41598-022-20870-9

Bios

Ms. Seema Subedi is a registered nurse at Nepal APF Hospital, She holds Master of Arts in Psychology. With over six years of professional experience, her areas of research include nursing practice and psychological well-being in clinical and community setting.

Email: seemasubedi10@gmail.com

Mr. Sanjesh Shrestha is an Assistant Professor at the Central Department of Psychology, TU. He holds a Master of Arts in Psychology and Public Administration. Working as a lecturer since 2062 BS, his research focuses on mental health, with extensive experience in teaching and academic mentorship.

Email: manobigyan100@gmail.com