

Preoperative anxiety among patients scheduled for elective surgical procedures during the COVID-19 pandemic - A cross-sectional study in a tertiary care teaching hospital in India

INTRODUCTION

Since the time the World Health Organization (WHO) has declared the coronavirus disease (COVID) as a pandemic on March 11, 2020, over 175 million people have been infected globally, with over 3 million deaths. The state where the present study was conducted recorded a total of 8,09,014 from March to December 2020. The state, like the rest of the country, was in a complete lockdown from March 24 to May 31, 2020. During this time, our centre, a 3,000-bedded tertiary care facility, halted non-COVID work and postponed elective surgeries. The elective surgeries in our centre resumed in June 2020 and were restricted to malignancy and trauma surgeries.

Studies have been conducted on the stress and anxiety induced by the COVID-19 pandemic in both the general population as well as specific groups, such as health care workers, pregnant women and adolescents.^[1-4] Given that anxiety has a strong bearing on the physical, mental and emotional well-being of the patients and their subsequent recovery from surgery and other procedures, we were interested in assessing anxiety among the patients presenting for elective procedures in the post-lockdown phase of the pandemic. The primary objective of the present study was to assess the anxiety levels among the preoperative patients scheduled for elective surgeries in the post-lockdown phase of the COVID-19 pandemic, and the secondary objective was to assess the factors accentuating the same.

METHODOLOGY

This cross-sectional study was conducted with the approval of the Institutional Review Board and Ethics Committee clearance (IRB Min. No. 13576 dated 25.11.2020). Since there was no validated questionnaire to assess the preoperative anxiety due to the COVID-19 pandemic, an appropriate

questionnaire was developed and validated as the first step. The modified Preoperative Anxiety Scale (mPAS) questionnaire is given in Appendix 1.

Data were collected over 3 months, from December 2020 to February 2021, by which time, the elective surgeries in our institution were 80–100% of the pre-pandemic levels. All patients aged 18 years and above and with a negative COVID-19 test were included in the study. The patients posted for emergency surgeries, those known to have a psychiatric illness or on psychiatric medication, and those with a positive COVID-19 test, both before the study or during the study, were excluded. The mPAS was administered a day prior to the surgery by the principal investigator in the surgical ward. The samples of the study patients were selected by systematic randomisation from the daily operation schedule. Informed consent was obtained from the selected study patients.

The anxiety score for each patient was calculated by adding the scores for individual questions. Every question has a minimum score of 1 and a maximum score of 4. The maximum score for Sections II, III and IV of the questionnaire was 20, 40 and 36, respectively. The patients who scored more than 10 in Section II were classified as having a baseline anxious trait, and those who scored more than 20 in Section III were classified as being anxious due to general preoperative factors. A score of more than 18 in Section IV indicated patients who were anxious due to COVID-19 specific factors at the time of the administration of the questionnaire.

The sample size was calculated based on a study done in India among preoperative patients.^[5] The prevalence of anxiety was quoted as 31% in this study. Assuming the prevalence to be 46% (15 more than 31), the design effect to be 8 and using the formula $4pq/d^2$ with $P = 46\%$, $d = 8$, the sample size was found to be 155.

The data entry was done using the EpiData software and the analysis by Statistical Package for Social Sciences (SPSS Armonk, NY: IBM Corp version 23). The demographic data were analysed by univariate analysis. The factors assessing anxiety were analysed by bivariate analysis, and multivariate analysis was done to exclude the confounding factors and establish a statistical significance. The bivariate analysis was done by the Chi-square test and the multivariate analysis was done by binary logistic regression. A P value of ≤ 0.05 was taken as statistically significant.

RESULTS

A total of 165 patients were chosen by systematic randomisation and approached, of which, 10 were excluded [Figure 1]. Following exclusion, a total of 155 patients were interviewed and included in the analysis. The demographic details are given in Table 1.

We found that 73% ($n = 114$) of our study population did not have an anxiety trait. Of the 27% who had the anxiety trait, most of them said that they either easily feel nervous/anxious/on the edge or become annoyed/irritable or both. When analysing the number of patients who were anxious due to general preoperative factors, 137 (88%) of the total study population were not anxious and only 18 (12%) were anxious, with most of them fearing the unexpected results of the surgery; 93% of the total study population was not anxious due to the COVID-19 pandemic [Table 2]. Of the 7% who was anxious, most of them feared the delay in the treatment and resuming normal life if tested positive [Figure 2].

Of the 114 patients who did not have a baseline anxiety trait, 8 (7%) were anxious before surgery due to COVID-19-related factors alone and only 3 (3%) were anxious due to both the general preoperative factors and COVID-19-related factors. On the other hand, of the number of patients who had a preoperative anxiety trait

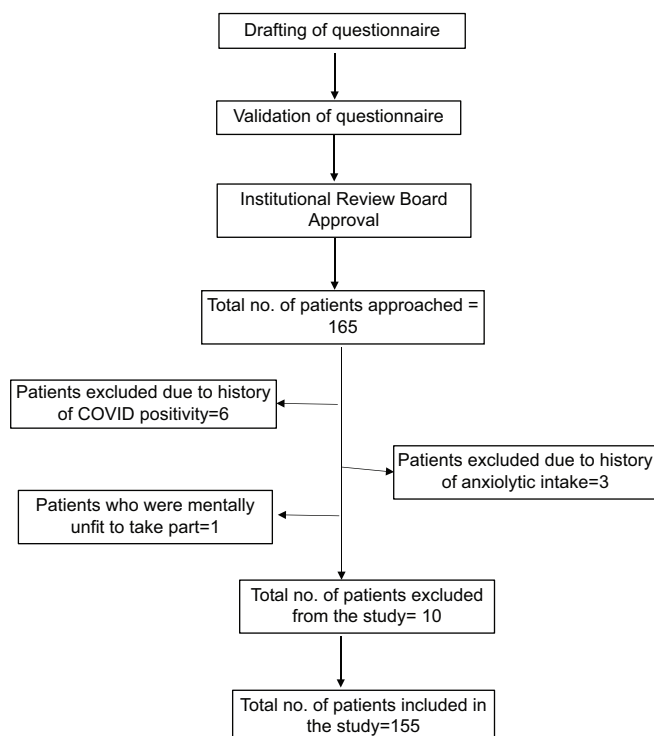


Figure 1: CONSORT diagram depicting the study population

($n = 41$), 39 (95%) of them were not anxious for either general preoperative factors or COVID-19-related factors.

The patients who were not educated or educated up to middle school were found to have 4.4 times

Table 1: The demographic characteristics of the study participants

Demographic characteristic	Frequency	Percentage
Age		
<60	128	82%
>=60	27	17%
Gender		
Male	80	52%
Female	75	48%
Education		
Up to middle school	31	20%
High school and above	124	80%
Occupation		
Unemployed	6	4%
Homemakers	75	48%
Employed	74	48%
SES		
Upper	33	21%
Lower	120	78%
Missing data	2	1%
Marital status		
Single	23	15%
Married	132	85%
Previous surgery		
Yes	105	68%
No	50	32%
Consumption of psychoactive substance		
Yes	23	15%
No	132	85%
Increase in consumption after diagnosis/ planning of surgery		
Yes	2	9%
No	21	91%

SES – Socioeconomic score

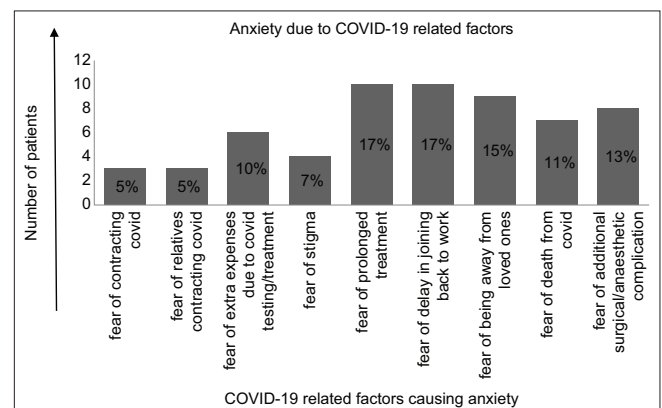


Figure 2: Bar diagram demonstrating the various COVID-19-related factors contributing to preoperative anxiety. The X-axis depicts the causes and Y-axis depicts the number of patients exhibiting anxiety due to the factors

Table 2: The percentage of the study population exhibiting baseline anxiety traits and feeling anxious in the preoperative period (n=155)

Causative factors	Anxious n (%)	Not anxious n (%)
Baseline anxiety trait	41 (27%)	114 (73%)
General preoperative factors	18 (11.6%)	137 (88.4%)
COVID-related factors	11 (7.1%)	144 (92.9%)
Anxious for both above factors combined	5 (3.2%)	150 (96.8%)

increased odds of having the anxiety trait than those who were educated higher (P value = 0.03; 95% confidence intervals [CI] = 1.073–6.636). Those who were single (divorced/unmarried) were found to have five times increased odds of being anxious due to the preoperative factors than those who were married (P value = 0.018; 95% CI = 1.316–19.081). The other demographic factors that were analysed and found to be not significantly associated with any anxiety score were age, gender, socioeconomic status, occupation, and a history of previous surgery.

DISCUSSION

Though preoperative anxiety and its various contributing factors have been widely researched, the impact of the COVID-19 pandemic on preoperative anxiety has not been studied yet. The abrupt postponement of elective surgeries, the fear of contracting COVID-19 during hospital visits, the projected increase in postoperative morbidity in COVID-19 patients undergoing surgical procedures are some of the factors which increase the anxiety in the patients awaiting surgeries during this pandemic. The patients with increased preoperative anxiety are shown to be benefited from psychological counselling along with premedication.^[6]

In our study, 25% of the study population had the anxiety trait. This was comparable to the study done by Doglietto *et al.*,^[7] among the neurosurgical patients posted for non-urgent surgery during the COVID-19 pandemic in Italy, where 18.9% of their study population had the anxiety trait. Further, 12% of the patients in our study population displayed anxiety due to general preoperative factors which was found to be lower as compared to a study done by Vadhanan *et al.*,^[5] among preoperative patients in India, where the figure was 30%. In this latter study, the authors assessed preoperative anxiety on the day of the surgery, just prior to the surgery. In comparison, the patients were interviewed by the principal investigator in our study on the day before their surgery.

A total of 7.1% of our study population expressed anxiety specifically due to COVID-19-related factors as compared to 30.3% in the study by Doglietto *et al.*^[7] This study was conducted during the immediate post-lockdown phase in Lombardy which had been one of the epicentres of the COVID-19 pandemic in Italy. In comparison, our study was conducted at a time when restrictions had been eased, and the COVID-19 cases were markedly fewer. This could explain the difference in the anxiety levels related to COVID-19 measured at different phases of the pandemic.

Among the patients who were anxious due to COVID-19-related factors, most of them feared prolonged treatment and delay in joining back for work or resuming normal life after being tested positive. The fear of being away from the loved ones and the fear of additional surgical or anaesthetic complications because of being COVID-positive were additional factors increasing anxiety in the preoperative period. Apart from the COVID-19 specific factors, we also analysed the association between the demographic features and state and trait anxiety. The educational status was found to have an association with the anxiety trait.^[8] Younger age and being single have also been found to be predictors of preoperative anxiety in various cultures. A few studies showed women to have a greater tendency to be anxious, but such a correlation could not be established in our study.^[2]

It was surprising to find that there was no significant association between the anxiety trait and the state of anxiety on the day before the surgery. The proportion of people who were anxious due to the COVID-19 pandemic was the same among those who had and who did not have the anxiety trait. This is in line with the findings of the study conducted by Leal *et al.*,^[9] where it is proven that a mere anxious trait does not add to an anxious response in case of a physical threat, which in this case would be the surgical intervention.

Contrary to what was expected, most of our study population did not display anxiety in the preoperative period either due to general or COVID-19-related factors. This may be due to several reasons. First, a majority of our study patients were undergoing major surgeries, with over 70% of them for malignancies. Cancer is seen as more life-threatening than COVID-19 and these patients had greater concerns about their primary disease as compared to the COVID-19 pandemic. A study conducted in Poland by Sigorski *et al.*,^[10] on the anxiety levels of cancer patients being actively treated with systemic therapy concluded that

fear and anxiety related to COVID-19 were significantly lower than cancer-associated anxiety.

Second, although the work for this study commenced in August 2020, the actual data collection began in December 2020. By this time, life in almost the entire country had returned to normal. Clearly, the levels of anxiety can vary at different phases of the pandemic. Third, 78% of the study patients belonged to the lower socioeconomic status. They might not have been fully aware of the gravity of the pandemic situation.

CONCLUSION

The prevalence of preoperative anxiety among patients admitted for elective surgeries in a large tertiary care teaching hospital during this COVID-19 pandemic was not found to be related to the preoperative anxiety trait of a patient. The anxiety levels in our population were less as compared to the quoted values in the literature.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published, and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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ANNEXURE 1: MODIFIED PREOPERATIVE ANXIETY SCALE (MPAS) QUESTIONNAIRE**Modified Preoperative Anxiety Scale (mPAS)**

1. Study No:

Demographic data

2. Age:

3. Gender: Male/Female

4. Education of participant:

5. Education of the head of the family:

6. Occupation of the participant:

7. Occupation of the head of the family:

8. Total monthly income of the family:

Occupation of the head of the family

S.No	Occupation of the head	Score
1	Legislators, senior officials and managers	10
2	Professionals	9
3	Technicians and associate professionals	8
4	Clerks	7
5	Skilled workers and shop and market sales workers	6
6	Skilled agricultural and fishery workers	5
7	Craft and related trade workers	4
8	Plant and machine operators and assemblers	3
9	Elementary occupation	2
10	Unemployed	1

Education of the head of the family

S.No	Education of the head	Score
1	Profession or Honours	7
2	Graduate	6
3	Intermediate or diploma	5
4	High school certificate	4
5	Middle school certificate	3
6	Primary school certificate	2
7	Illiterate	1

Updated monthly family income in rupees (2020)

Income	Score
>= 199,862	12
99,931-199,861	10
74,755-99,930	6
49,962 – 74,755	4
29,973 – 49,961	3
10,002 – 29,972	2
<=10,001	1

9.

S.No	Score	Socioeconomic class
1	26-29	Upper (I)
2	16-25	Upper Middle (II)
3	11-15	Lower Middle (III)
4	5-10	Upper Lower (IV)
5	<5	Lower (V)

10. Marital status: a. Single b. Married c. Divorced

11. Surgical procedure:

12. Previous Surgery: Yes/No

13. Have you ever been diagnosed with any kind of mental illness: Yes/No

14. Do you use any kind of anti-psychiatric medication? Yes/No

15. Do you use any kind of psychoactive substances? Yes/No

16. If yes, which one? Ganja (Marijuana)/Tobacco/Alcohol/Others

17. If so, has the consumption increased since the time of diagnosis/planning of surgery: Yes/No

How do you describe yourself?

Over the last 2 weeks, how often have you been bothered by the following problems?	Not a single day (1)	On a few days (2)	On a significant number of days (3)	Almost every day (4)
18. Feeling nervous, anxious or on edge				
19. Not being able to stop or control worrying				
20. Trouble relaxing				
21. Becoming easily annoyed or irritable				
22. Feeling afraid as if something awful might happen				

Total score =

Anxiety Due To General Preoperative Factors

For the following questions, please tell us how anxious you are, on a scale of 1–4. Kindly tell us your feelings as honestly as possible.

Q. no	Factors:	1. Not at all anxious	2. Somewhat anxious	3. Reasonably anxious	4. Very much anxious
23.	Fear of Postoperative pain				
24.	Fear of physical disability				
25.	Fear of harm from doctor or nurse's mistake				
26.	Fear of need for blood transfusion				
27.	Fear of financial loss due to hospitalisation				
28.	Fear of surgical complications				
29.	Fear of anaesthetic complication				
30.	Fear of death from the disease				
31.	Fear due to prior adverse hospital experience of self/others				
32.	Fear of injections				

Total score =

Preoperative Anxiety Due To Specific Covid-19 Pandemic-Related Factors

For the following questions, please tell us how anxious you are, on a scale of 1–4. Kindly tell us your feelings as honestly as possible.

Q. Factors: no	1. Not at all anxious	2. Somewhat anxious	3. Reasonably anxious	4. Very much anxious
33. Fear of contracting COVID-19 during my hospital stay in the preoperative period				
34. Fear of relatives contracting COVID-19 because of visiting me				
35. Fear of extra expenses due to COVID-19 testing and treatment				
36. Fear of stigma (of hospitalisation during this COVID-19 pandemic)				
37. Fear of prolonged treatment due to the COVID-19 pandemic situation				
38. Fear of delay in joining back to work/resuming normal life because of the COVID-19 pandemic				
39. Fear of being away from loved ones if tested COVID-19 positive at any time				
40. Fear of death from COVID-19				
41. Fear of additional surgical/anaesthetic complications because of contracting COVID-19				

COVID-19—Coronavirus disease-19

Total score =