

Prevalence of Anxiety amongst Interns while Performing Treatments in Dental Colleges of Navi Mumbai: A Cross-sectional Survey

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ABSTRACT

Introduction: Anxiety is one of the most commonly experienced disorders across gender and all ages. Dental anxiety seen in patients prior to or during treatment is a well-researched topic. However, anxiety experienced by interns while treating patients in the dental college is a lesser explored side of the same coin.

Aim: To evaluate and understand the prevalence of anxiety experienced by dental interns while performing treatments in a college clinical set-up and studies the various factors precipitating anxiety.

Materials and Methods: This cross-sectional survey was conducted using Google forms, amongst interns of five dental colleges in Navi Mumbai region from July 2021 to October 2021. A sample size of 350 was derived by convenient sampling method. The parameters assessed via questionnaire through a Likert-type response scale included various factors precipitating anxiety amongst interns such as performing invasive dental treatments, lack of in-depth knowledge of procedures, age, attitude and medical conditions of patients, encountering complications

while treating patients, presence of supervision and working with anxious peers. Chi-square test was performed to analyse collected data, extract results and draw a conclusion.

Results: Out of 350 participants, 332 showed symptoms of anxiety while treating patients in clinics. No significant gender predilection was noted for anxiety ($p=0.544$). Factors precipitating anxiety included performing invasive dental treatments ($p=0.0004$), lack of in-depth knowledge of certain procedures ($p=0.020$), patient's attitude ($p=0.017$), treating patients with certain medical conditions ($p=0.035$) as well as encountering complications while treating patients ($p=0.022$). A significant number of participants thought that anxiety leads to more procedural errors ($p=0.010$). The need to incorporate anxiety management in the dental curriculum was observed ($p=0.023$).

Conclusion: The results of this study showed prevalence of anxiety amongst dental students and highlighted the need to incorporate anxiety management programs in the curriculum. Preparing interns to cope with anxiety resulting from treating patients seems to be of importance for their future clinical practice.

Keywords: Clinical anxiety, Psychology, Questionnaire, Stress

INTRODUCTION

The definition of anxiety as adapted from the Encyclopedia of Psychology, 'is an emotion characterised by feelings of tension, worried thoughts and physical changes like increased blood pressure' [1]. Dental anxiety among patients is a well-known and commonly researched aspect of dentistry [2,3]. The prevalence of dental anxiety has been found to vary in content, pattern, and level of fear across different cultures and different populations [4-6].

The stressful nature of dentistry starts early as dental students are expected to acquire a wide range of knowledge and a variety of skills to help them succeed in their studies and also in their future career. Dentists might experience occupational stress from their interaction with staff and patients, problems in the treatment of patients, time pressure and paper work [7-9]. However, the anxiety dental interns face while working in the clinics, is an important but a lesser explored side of the two-way street. The dental clinical setting, which is a significant learning environment for undergraduate dental students, may induce anxiety, which in turn may adversely affect their clinical performance. Although, anxiety is subjective to individual experience, it may present in one of the following ways: symptoms like irrational fears, restlessness, irritability, nervousness, inability to focus and physical signs like increased heart rate, palpitations, sweating etc., [10]. Anxiety amongst interns while performing dental procedures can have implications on their efficacy, efficiency, and productivity [11].

Dental students are known to be subjected to considerable levels of stress and anxiety during their training period, and this has been demonstrated in various studies [12-15]. Although there is conflicting data on the impact of stress on the academic performance of dental students [16], there is existing evidence in the literature indicating

that high levels of perceived stress and anxiety result in psychological morbidity and emotional exhaustion. This may predispose them to professional burnout and decreased productivity [7]. Although similar studies exist [17,18], there is a need to assess the prevalence of anxiety amongst dental interns specifically in India as the curriculum, patient and environmental factors differ from other countries.

The lacunae in previously available studies and literature were that, very few studies have been conducted in India and none of them had been in the Navi Mumbai region which has five dental colleges [2,19]. The novelty of this study was that it focused on the interns studying in the five dental colleges of Navi Mumbai region. These colleges have similar patient demographics and nature of students is also similar. Dental students, who are future frontline healthcare providers, need to learn about the techniques that can help them to overcome their own anxiety [20]. A decrease in their anxiety levels would make them confident practitioners, who could in turn treat their patients well.

This cross-sectional survey-based assessment of anxiety aimed to assess the prevalence of anxiety amongst interns in a college clinical set-up, the various factors precipitating that anxiety and gender predilection (if any). Another aim was to gauge the need for incorporating anxiety management in the dental curriculum. Null hypothesis for this study was that there is no prevalence of anxiety amongst dental interns in a college clinical set-up, no factors precipitating anxiety and hence, no sex predilection with regards to anxiety experienced by interns.

MATERIALS AND METHODS

This cross-sectional study was conducted across five dental colleges of Navi Mumbai, India from July 2021 to October 2021. Ethical approval

was acquired from the Ethics Committee of MGM Dental college, Navi Mumbai (Reg no. ECR/786/Inst/MH/2015/RR-18 & Abstract no. IN-001-02-22); participation in this study was on a voluntary basis and an online informed consent was obtained from all participants.

Inclusion criteria: Only completely filled out forms by interns of five dental colleges were included in the study.

Exclusion criteria: Incompletely filled out forms and those previously diagnosed with anxiety by a physician were excluded from the study.

Sample size estimation: Based on a similar study [19], a power analysis and sample size estimation by convenient sampling method was performed. Power analysis showed that with a power of 1.28 and a significance level of 1.96, approximately 66 participants were required per study group. However, considering the dropout cases, 70 participants in each group were included. But the above study was not a comparative study and only considered dental students in various colleges in Navi Mumbai had been considered. Hence, required sample would be 70+70+70+70+70=350.

Questionnaire: It was distributed to all interns (500) of five dental colleges of Navi Mumbai region via Google Forms. The respondents completed the questionnaires anonymously, and no data except gender and age were collected.

A custom-made questionnaire was developed by the surveyors [Table/Fig-1]. No previous questionnaire was referred to while designing this study questionnaire. The questionnaire consisted of 18 multiple choice closed ended questions with choices based on a Likert-type scale. The multiple-choice questions were aimed at assessing the various factors precipitating anxiety amongst dental interns and to understand the gender predilection (if any) associated with anxiety. The options provided to participants were graded for the purpose of statistical analysis. Face validation of the questionnaire was done by 10 professors/validators within and outside the institution. This was followed by a pilot study and statistical reliability testing was conducted and Cronbach's alpha value of 0.9 was derived.

Question number	Question	Response/Options
1a	Have you ever been diagnosed with anxiety (generalised anxiety disorder/panic disorder/ other specific phobias) by a medical professional?	a. Yes b. No
1b	If yes, have you been treated or undergoing treatment for anxiety?	a. Yes b. No
2	Do you think you show symptoms of anxiety such as nervousness, increased heart rate, shortness of breath, trembling, sweating or any other symptoms when you see patients for treatment?	a. About hundred percent of the time b. More than half of the times c. Less than half of the times d. About twenty percent of the time e. Never
3	Do you feel anxious every time you do a new procedure on a patient?	a. About hundred percent of the time b. More than half of the times c. Less than half of the times d. About twenty percent of the time e. Never
4	Do you feel anxious every time you perform a previously performed procedure?	a. About hundred percent of the time b. More than half of the times c. Less than half of the times d. About twenty percent of the time e. Never
5	Which procedure invokes anxiety in you (multiple choice)?	a. Invasive procedures such as extractions, Subgingival scaling. b. Non invasive procedures such as oral examination, radiographs, Impression making. c. Lengthy procedures such as recording jaw relation, root canal treatment. d. Performing procedure in a stipulated time frame

6a	Do you think your anxiety is a result of lack of in-depth knowledge or concept of a particular procedure?	a. Yes b. No
6b	If yes, then how often?	a. About hundred percent of the time b. More than half of the times c. Less than half of the times d. About twenty percent of the time e. Never
7	Do you think your anxiety levels have changed as you went from Third year to Final year to Internship?	a. Yes, they have increased b. Yes, they have decreased c. No change d. I don't know
8	Do you think the patient's age influences your anxiety level in a clinical setting?	a. About hundred percent of the time b. More than half of the times c. Less than half of the times d. About twenty percent of the time e. Never
9	Do you think the patient's attitude influences your anxiety?	a. About hundred percent of the time b. More than half of the times c. Less than half of the times d. About twenty percent of the time e. Never
10	Do you think medical conditions of the patient influence your anxiety?	a. About hundred percent of the time b. More than half of the times c. Less than half of the times d. About twenty percent of the time e. Never
11	Do you feel anxious when you encounter complications or challenges in management of a patient?	a. About hundred percent of the time b. More than half of the times c. Less than half of the times d. About twenty percent of the time e. Never
12	Do you feel anxious while performing procedures under staff supervision?	a. About hundred percent of the time b. More than half of the times c. Less than half of the times d. About twenty percent of the time e. Never
13	Do you feel anxious when you perform a procedure which is related to your evaluation?	a. About hundred percent of the time b. More than half of the times c. Less than half of the times d. About twenty percent of the time e. Never
14	Do you think your peers observing you while you perform procedures evokes anxiety?	a. About hundred percent of the time b. More than half of the times c. Less than half of the times d. About twenty percent of the time e. Never
15	Do you think working with a peer reduces anxiety?	a. About hundred percent of the time b. More than half of the times c. Less than half of the times d. About twenty percent of the time e. Never
16	Do you think working with an anxious peer also evokes anxiety in you?	a. About hundred percent of the time b. More than half of the times c. Less than half of the times d. About twenty percent of the time e. Never
17	Do you think anxiety results in more procedural errors?	a. About hundred percent of the time b. More than half of the times c. Less than half of the times d. About twenty percent of the time e. Never
18	Do you think anxiety management should be a part of your curriculum?	a. Definitely b. Maybe c. Not required

[Table/Fig-1]: Questionnaire.

STATISTICAL ANALYSIS

The statistical software used to calculate the sample size was SPSS software version 20.0 (Statistical Package for Scientific Studies, SPSS, Inc., Chicago, IL, United States of America (USA) for Windows. The collected data was converted to excel sheets and analysed. Chi-square test was performed to extract results.

RESULTS

Out of 500 questionnaires distributed to interns via Google forms across five dental colleges of Navi Mumbai, 398 responses were received, out of which a total of 350 completely filled forms were included and 48 forms were excluded from the study as 34 were incompletely filled and 14 had been previously diagnosed with

anxiety. The response rate was 79.6% (398 out of 500). The mean age of the participants was 23±2 years. The distribution of participants according to age and gender has been presented in [Table/Fig-2].

Age (years)	Female	Percentage %	Male	Percentage %	Total	Percentage %
>21-22	1	100.0	0	0.0	1	100.0
>22-23	32	84.2	6	15.8	38	100.0
>23-24	185	73.4	67	26.6	252	100.0
>24-25	31	68.9	14	31.1	45	100.0
>25	6	42.9	8	57.1	14	100.0
Total	255	72.9	95	27.1	350	100.0

[Table/Fig-2]: Age and gender wise distribution of students.

No gender predilection was noted about symptoms of anxiety (p=0.544) as shown in [Table/Fig-3]. There was presence of significant prevalence of symptoms of anxiety in 332 out of the 350 interns (p =0.053). No significant anxiety was found amongst interns while performing new or previously performed treatments. Performing invasive dental treatments such as extractions and sub-gingival scaling evoked significant anxiety (p=0.0004). Another factor noted in this study which caused significant anxiety was the lack of in-depth knowledge of certain treatments (p=0.020). The results also showed that anxiety levels reduced as students

Data collected	Female n (%)	Male n (%)	chi-square	p-value
Show symptoms of anxiety	243 (95.3%)	89 (93.7%)	0.367	0.544
No symptoms of anxiety shown	12 (4.7%)	6 (6.3%)		

[Table/Fig-3]: Gender predilection in responses showing anxiety.

progressed from third year to internship. The influence of patient's age in evoking anxiety amongst interns while treating patients was not significant. Other factors evoking anxiety included patient's attitude (p=0.017) and medical conditions (p=0.035). The results also portrayed significant anxiety in interns when they encounter certain complications or challenges (p=0.022) during patient management.

No significant anxiety was noted when interns performed treatments under the supervision of faculty or if they were being evaluated by faculty members. Similarly, the study revealed no anxiety was present in interns treating patients while being observed by a peer, while working with a peer or while working with an anxious peer. A significant number of participants thought that anxiety leads to more procedural errors (p=0.010). Results showed that interns think that anxiety management should be a part of their academic curriculum was statistically significant (p=0.023) [Table/Fig-4].

Question no.	Question/ Factor Precipitating Anxiety	Number of responses (n)	% ages of responses	chi square test value	p-value
1A	Have you ever been diagnosed with anxiety (generalised anxiety disorder/panic disorder/ other specific phobias) by a medical professional?	Yes=14	Yes=3.9	1.219	0.270
		No=336	No=96.1		
1B	If yes, have you been treated or undergoing treatment for Anxiety?	Yes=5	Yes=35.714		
		No=9	No=64.285		
2	Do you show symptoms of anxiety such as nervousness, increased heart rate, shortness of breath, trembling, sweating or any other symptoms?	~100%=3	~100%=0.85	9.342	0.053
		>50%=24	>50%=6.857		
		<50%=162	<50%=46.285		
		~20%=143	~20%=40.85		
		0%=18	0%=5.142		
3	Do you feel anxious every time you do a new procedure on a patient?	~100%=10	~100%=2.857	8.480	0.076
		>50%=273	>50%=78		
		<50%=35	<50%=10		
		~20%=21	~20%=6		
		0%=11	0%=3.142		
4	Do you feel anxious every time you perform a previously performed procedure?	~100%=4	~100%=1.143	3.706	0.447
		>50%=6	>50%=1.714		
		<50%=32	<50%=9.142		
		~20%=277	~20%=79.142		
		0%=31	0%=8.857		
5	Which procedure invokes anxiety in you?	Invasive=221	Invasive=63	15.326	0.0004
		Non-invasive=0	Non invasive=0		
		Lengthy=67	Lengthy=19.14		
		Stipulated time=62	Stipulated time=17.71		
6a	Do you think anxiety is a result of lack of in-depth knowledge or concept of a particular procedure?	Yes=134	Yes=38.285	5.370	0.020
		No=216	No=61.714		
6B	If yes, then how often	~100%=3	~100%=2.238	6.385	0.094
		>50%=8	>50%=5.970		
		<50%=23	<50%=17.16		
		~20%=100	~20%=74.626		
7	Do you think your anxiety levels have changed as you went from third year to final year to internship?	Yes, increased=19	Yes, increased=5.428	2.514	0.473
		Yes, decreased=305	Yes, decreased=87.142		
		No change=18	No change=5.142		
		Don't know=8	Don't know=2.285		

8	Do you think the patient's age influences your anxiety level in a clinical setting?	~100%=2	~100%=0.571	5.679	0.224
		>50%=16	>50%=4.571		
		<50%=38	<50%=10.857		
		~20%=151	~20%=43.142		
		0%=143	0%=40.857		
9	Do you think the patient's attitude influences your anxiety?	~100%=6	~100%=1.714	12.049	0.017
		>50%=26	>50%=7.428		
		<50%=147	<50%=42		
		~20%=156	~20%=44.57		
		0%=15	0%=4.285		
10	Do you think medical conditions of the patient influence your anxiety?	~100%=8	~100%=2.285	10.378	0.035
		>50%=154	>50%=44		
		<50%=156	<50%=44.57		
		~20%=25	~20%=7.142		
		0%=7	0%=2		
11	Do you feel anxious when you encounter complications or challenges in management of a patient?	~100%=18	~100%=5.142	11.415	0.022
		>50%=281	>50%=80.285		
		<50%=28	<50%=8		
		~20%=21	~20%=6		
		0%=2	0%=0.571		
12	Do you feel anxious while performing procedures under staff supervision?	~100%=8	~100%=2.285	2.499	0.645
		>50%=41	>50%=11.714		
		<50%=262	<50%=74.857		
		~20%=29	~20%=8.285		
		0%=10	0%=2.857		
13	Do you feel anxious when you perform a procedure which is related to your evaluation?	~100%=6	~100%=1.714	2.060	0.725
		>50%=181	>50%=51.714		
		<50%=124	<50%=35.428		
		~20%=27	~20%=7.714		
		0%=12	0%=3.42		
14	Do you think your peers observing you while you perform procedures evokes anxiety?	~100%=4	~100%=1.142	7.277	0.122
		>50%=22	>50%=6.285		
		<50%=69	<50%=19.714		
		~20%=208	~20%=59.428		
		0%=47	0%=13.428		
15	Do you think working with a peer reduces anxiety?	~100%=8	~100%=2.285	5.626	0.229
		>50%=241	>50%=68.857		
		<50%=68	<50%=19.428		
		~20%=22	~20%=6.285		
		0%=11	0%=3.142		
16	Do you think working with an anxious peer also evokes anxiety in you?	~100%=5	~100%=1.428	4.587	0.332
		>50%=222	>50%=63.428		
		<50%=70	<50%=20		
		~20%=34	~20%=9.714		
		0%=19	0%=5.428		
17	Do you think anxiety results in more procedural errors?	~100%=50	~100%=14.28	13.100	0.010
		>50%=261	>50%=74.57		
		<50%=15	<50%=4.28		
		~20%=17	~20%=4.85		
		0%=7	0%=2		
18	Do you think anxiety management should be a part of your curriculum?	Definitely=314	Definitely=89.71	7.514	0.023
		Maybe=24	Maybe=6.85		
		Not required=12	Not required=3.42		

Table/Fig-4]: Results derived from responses. Bold p-values are significant

DISCUSSION

This cross-sectional survey demonstrated the prevalence of symptoms of anxiety amongst interns in dental colleges of Navi

Mumbai. Results portrayed that female interns are more likely to experience anxiety in a clinical set-up as compared to their male counterparts. The gender predilection of anxiety in the responses

of this survey however, was not statistically significant which may be attributed to the fact that dental colleges of Navi Mumbai have more number of female interns than males. Out of total 255 females (95.3%) and of total 95 males (93.7%), said they had symptoms of anxiety. However, studies conducted by Holtzman JM et al.; Farooq I and Ali S; showed that females were found to be more anxious than males probably because females are more responsive to a particular stimulus (like fear of the needle) than males [21,22]. Another study by Pierce KA and Kirkpatrick DR; showed similar results and stated that it could be because males tend to hide their fears due to their conventional gender role [23].

The results of present study showed that there was no significant anxiety noted in interns while performing any new or previously performed procedures. This could be because interns only perform procedures that they are well versed with and are always guided by their seniors or faculty members. Thus, they are not held solely responsible for the outcome of any procedure.

The current study depicted that anxiety was significantly evoked in interns while performing invasive treatment procedures like extractions and subgingival scaling which is similar to a study by Obarisiagbon A et al., [24]. Another study by Kieser J and Herbison P also showed that students were most stressed by the prospect of surgical procedures [25]. Lengthy procedures such as recording jaw relations and root canal treatments fail to evoke anxiety as these are taught to students in their pre-clinical curriculum.

The result of this survey signified that anxiety levels reduced as students move from third to fourth year and then internship. It was in line with studies which show that pre-clinical students (first and second year) were found to be more anxious than clinical students (third and fourth year) [26,27]. This survey also highlighted that anxiety is precipitated when there is lack of in-depth knowledge of procedures. It justified the reduction in anxiety levels as students progress from third year to internship as the knowledge and experience increases.

The survey concluded that anxiety was not significantly influenced by the age of the patient. This may be because internship in Indian dental colleges is a one-year rotatory program which exposes interns to various departments and thus they get to interact and treat a plethora of patients including pediatric and geriatric patients. Development of soft skills as one progresses from pre-clinical years to internship renders interns the ability to deal with patients of all ages without any anxiety.

A review by Jubhari EH and Rachelea K; suggests that it is often more difficult to manage exacting patients than polite and compliant ones [28]. The above study too highlights the influence of patient's attitude and medical conditions on anxiety in interns. It could be attributed to the lack of knowledge amongst interns to deal with certain medical conditions or complications that arise when they treat patients in a clinical set-up.

When it comes to interns performing procedures under the supervision of faculty, the survey results revealed that this factor does not contribute in significantly evoking anxiety amongst interns as they are not graded by the faculty nor do they undergo any examinations. As students progress from first year to internship, they develop a rapport with their faculty and feel a certain sense of comfort while performing treatments under staff supervision.

It was noted that interns do not significantly experience anxiety while working with or being observed by a peer. Working with an anxious peer also didn't significantly affect anxiety levels. There exists a certain sense of familiarity and comfort between the individuals involved in treating the patients together or observing each other's work which explains no anxiety. Secondly, lack of anxiety can be explained by the concept of "Peer assisted learning" which has been encouraged by dental colleges in recent times. Peer assisted learning involves interns to interact with their colleagues or seniors, assist them in their cases and practice in a protected learning environment [29,30].

It was also noted in this study that most interns believe that anxiety significantly affects their work and they tend to make more procedural errors. As the authors know from the definition of anxiety as stated in the Encyclopedia of Psychology [1], as it affects a person mentally as well as physically, thus it is only justified that overall efficacy of an intern might reduce when he/she experiences anxiety while treating patients.

An important aspect of this study was also to understand the need of incorporating anxiety management programs in the curriculum for interns and the results showed an overwhelming response in its favor. A study by Basudan S et al., also concluded similar findings which highlighted the importance of providing support programs and implementing preventive measures to help students with anxiety and stress [31]. Anxiety level during clinical classes is relatively high in students and preparing them to cope with stress resulting from treating the patients seems to be of importance [32]. [Table/Fig-5] is showing comparison of present study with similar studies [24-28,31].

S. no.	Author's name	Year of study	Place of study	Number of subjects	Age of participants	Conclusion
1	Obarisiagbon A et al., [24]	2012	University of Benin, Nigeria	67	20-30 years Mean age=25.13 years	Study shows that performing invasive procedures evoke anxiety
2	Kieser J and Herbison P [25]	2000	Faculty of Dentistry, University of Otago	120	19-21 years (Second & third year students)	Study shows that performing invasive procedures evoke anxiety
3	Tangade P et al., [26]	2010-2011	MJP Rohaikhad University, India	304	First year to fourth year BDS Students	Study shows that First year students are more anxious than fourth year students
4	Blumer S et al., [27]	2017	School of Dental Medicine, Tel Aviv University	124	26.4±3.1 years	Study shows that First year students are more anxious than fourth year students
5	Jubhari E H and Rachelea K [28]	2020- Articles published in English in the last 20 years	Systematic review	-	-	It is difficult to manage exacting patients
6	Basudan S et al., [31]	November -December 2014	College of Dentistry of KSU in Riyadh City, Saudi Arabia	247	Second year to Interns	Study shows importance of providing support programs and implementing preventive measures to help students with anxiety
7	Present Study	July to October 2021	5 Dental colleges of Navi Mumbai	350	23±2 years	Results showed that anxiety is evoked while performing invasive procedures, anxiety reduces as one progresses from third & final years to internship, anxiety is influenced by patient's attitude and there is a need for incorporating anxiety management in dental curriculum.

[Table/Fig-5]: Comparison of studies [24-28,31,Present study].

Limitation(s)

The sample was not representative of the population of all interns across India since they were from one particular region. Therefore, such studies need to be carried out, using the same methodology, in most dental colleges in the country. Moreover, this was a cross-sectional survey, so it seems necessary to continue the research as a longitudinal study for the same interns in the following years. It could be interesting to perform such follow-ups to observe the changes in the prevalence and levels of anxiety in individuals. Additionally, our data was based on a questionnaire, which might be influenced by acquiescence bias wherein survey respondents tend to agree with survey questions without their response being a true reflection of their own position or beliefs because it is easier to say yes or answer in a way which pleases a researcher or to just complete the survey.

CONCLUSION(S)

The results of this study showed the 94.8% of dental interns showed symptoms of anxiety. Various factors influencing anxiety include performing invasive dental treatments, patient's attitude, medical conditions of the patient, encountering complications during patient management and lack of knowledge of certain procedures. This study showed that no statistically significant gender predilection with respect to anxiety symptoms. However, research on this aspect needs to be continued to better understand this aspect of anxiety affecting interns. This study concluded that there is a significant need of incorporating anxiety management programs in the curriculum. An anxious intern will tend to make procedural errors which may be otherwise avoidable. Thus, anxiety management programs must be implemented before the start of practical clinical classes. The acquired knowledge will then prove useful in their future professional career.

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