

# An Investigation into Anxiety Experienced by Undergraduate Dental Students during Prosthodontics Exams

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## ABSTRACT

**Introduction:** The demanding intellectual and clinical requirements of Dental education are well-known. Among the various specializations, Prosthodontics is often perceived as particularly challenging due to its technical complexity and precision requirements.

**Methods:** This study employed a cross-sectional, Questionnaire-based survey design to assess levels of anxiety among Undergraduate Dental students during Prosthodontics examinations.

**Results:** A total of 123 Undergraduate Dental students participated in the study, with a response rate of 84.82%. According to the demographic breakdown, 33.6% of the pupils were male and 66.4% were female. The majority were in their fourth year (49.2%) and third year (27%) of study.

**Conclusion:** This study revealed that a significant proportion of Undergraduate Dental students experience moderate to high levels of anxiety during Prosthodontics examinations. The main contributing factors identified were fear of clinical errors, limited preparation time, and perceived examiner strictness. Anxiety levels were generally greater among female pupils and those who performed less academically. These findings highlight the need for targeted interventions, such as stress management workshops, improved exam preparation strategies, and supportive examiner-student interactions, to help reduce exam-related anxiety and enhance student performance and well-being.

**Keywords:** Dental student anxiety, Academic stress, Prosthodontics examination, Undergraduate, Clinical assessment stress

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## INTRODUCTION

Anxiety is a common psychological response among students in higher education, particularly in high-stakes, performance-driven environments such as medical and Dental schools. In Dental education, students are frequently exposed to rigorous academic and clinical demands, contributing to elevated levels of stress and anxiety, especially during examinations.<sup>[2]</sup>

Among the various Dental disciplines, Prosthodontics is often perceived as particularly challenging due to its technical complexity, precision requirements, and the pressure of performing clinical procedures under supervision. Examination-related anxiety can negatively affect not only students' academic performance but also their confidence and long-term clinical competence (Pau et al., 2007). It may manifest as physiological symptoms (e.g., increased heart rate, sweating), cognitive impairments (e.g., reduced concentration), and emotional distress — all of which may interfere with students' ability to perform to their full potential.<sup>[4]</sup>

Academic anxiety is a well-documented phenomenon among students in professional healthcare programs, with Dental students consistently reporting high stress levels due to the demanding nature of their curriculum. The Dental program combines intensive theoretical learning with the development of precise clinical skills, making it inherently stressful<sup>[6]</sup>. One of the key stress-inducing components of Dental education is assessment — particularly practical or clinical examinations, where students must demonstrate technical competencies under direct observation.

Prosthodontics, which involves the restoration and replacement of teeth, poses unique challenges. It demands in-depth theoretical knowledge, fine motor skills, spatial awareness, and strong clinical judgment. Clinical prosthodontic examinations often simulate real patient scenarios, and the fear of making errors or being judged by examiners can exacerbate performance anxiety<sup>[5]</sup>. These assessments typically include both preclinical laboratory-based tasks and live clinical evaluations, intensifying students' stress.

While general academic stress and anxiety in Dental students have been widely explored, specific data on anxiety experienced during Prosthodontics exams is limited. Understanding this focused area of academic anxiety is critical for developing targeted interventions to support student well-being. Anxiety, if unaddressed, may impair cognitive function, reduce academic performance, and even influence long-term career satisfaction and mental health outcomes.<sup>[7]</sup>

Dental education is recognized as one of the most demanding and psychologically stressful academic paths. Students must master extensive theoretical knowledge while simultaneously acquiring precise manual skills under tight time constraints and continuous evaluation. Research shows that dental students often experience higher psychological stress compared to students in other healthcare or non-healthcare disciplines<sup>[9]</sup>. The primary stressors include heavy academic workload, fear of failure, clinical responsibilities, and high-stakes assessments.<sup>[10]</sup>

The subject of Prosthodontics, in particular, combines Biomedical science, Engineering concepts, and Clinical artistry — requiring technical precision, spatial perception, and an understanding of Esthetics and patient function. The transition from preclinical to clinical Prosthodontics can be especially anxiety-inducing, as students apply theoretical knowledge to real patients, often under close supervision for the first time.<sup>[11]</sup>

High anxiety during such exams may impair motor coordination, decision-making, and communication — all of which are essential to safe and competent Dental care. Long-term effects of unresolved academic anxiety include burnout, dissatisfaction, and early professional dropout<sup>[8]</sup>

Although there is substantial research on general stress and anxiety in Dental students, few studies have specifically examined the anxiety experienced during Prosthodontic examinations, which often include both theoretical and clinical components. Understanding the extent and sources of this anxiety is crucial for building healthier academic environments.

This study aims to investigate the levels of anxiety experienced by Undergraduate Dental students during Prosthodontics examinations, identify the key contributing factors, and explore associations with demographic and academic variables. The findings may help inform educational reforms and promote psychological well-being in Dental education.

While general anxiety and academic stress among Dental students have been widely studied, there is limited research focusing specifically on anxiety experienced during Prosthodontics exams, which often combine both theoretical and clinical assessments. Understanding the extent and sources of such anxiety is critical for developing supportive strategies within Dental curricular.

This study aims to investigate the levels of anxiety experienced by Undergraduate Dental students during Prosthodontics examinations, identify key contributing factors, and explore associations with demographic and academic variables. The findings may help inform educational strategies that promote mental well-being and improve academic performance in Dental education.

Hypothesis that was tested in this research was:

- To determine which particular elements—such as the practical vs theoretical components, fear of failing, time limits, and the behaviour of the assessor—are causing anxiety during prosthodontics exams.
- To investigate how anxiety levels relate to demographic factors such academic achievement, gender, and year of study.
- To investigate the coping mechanisms of student use to control their anxiety during prosthodontics exams.
- To offer suggestions for academic and psychological support strategies meant to lessen exam-related stress in dental school.

## METHODOLOGY

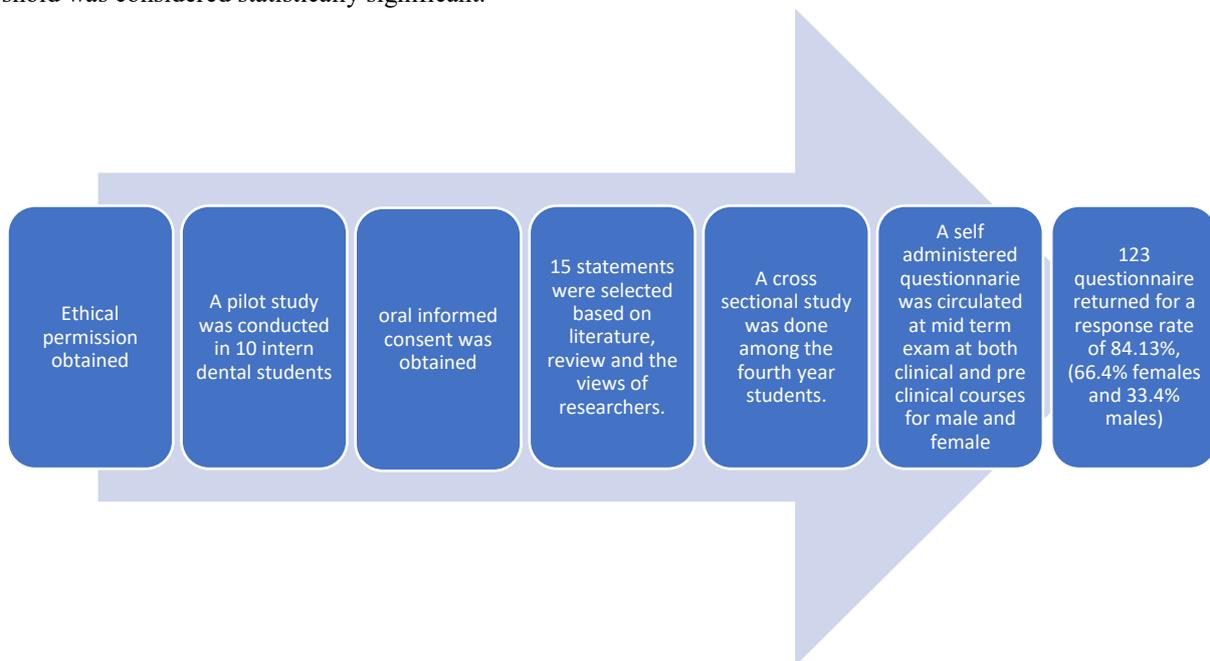
This study was designed as a cross-sectional, questionnaire-based survey conducted among Undergraduate Dental students who had completed or were preparing for Prosthodontics examinations. The research was carried out at [insert institution name] over a period of [insert duration, e.g., four weeks], following ethical approval from the Institutional Ethics Committee.

Eligible participants included students from the Second, Third, and Final years of the BDS program who had either Preclinical or Clinical exposure to Prosthodontics. Students who were unavailable during the data collection period or who declined to give consent were not included in the study.

Data collection was done using a structured, self-administered questionnaire, which consisted of two sections. The first section gathered basic demographic details such as age, gender, and academic year. The second section focused on anxiety related to Prosthodontics exams, incorporating questions based on the Modified Dental Anxiety Scale (MDAS) along with additional items targeting exam-specific stress factors like fear of failure, performance under supervision, and preparation levels. The questionnaire was reviewed for clarity and reliability before being distributed. Participation was entirely voluntary, and all responses were kept anonymous to maintain confidentiality

**Statistical Methodology:**

Collected data were compiled in Microsoft Excel and analysed using SPSS version XX. Descriptive statistics were used to summarize the data, while chi-square tests were applied to explore any associations between anxiety levels and selected variables such as gender and academic year. A p-value of less than 0.05 was considered statistically significant. Sample size of 96 was required to get power of 84.13%. Basic descriptive statistics such as frequencies, percentages, means, and standard deviations were used to summarize demographic details and anxiety scores. To explore possible relationships between anxiety levels and variables like gender, academic year, and clinical exposure, chi-square tests were applied. The significance level was set at  $p < 0.05$ , meaning that any association with a p-value below this threshold was considered statistically significant.

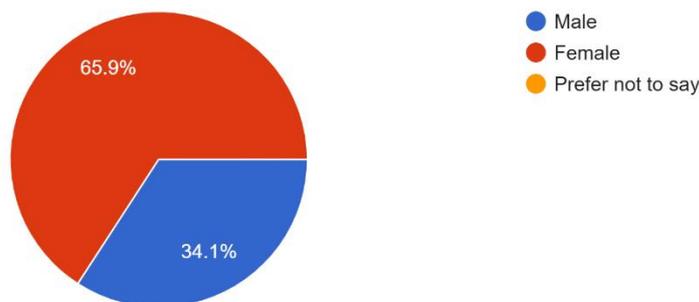


**Figure 1**

**RESULTS:**

Out of 145 students invited, 123 completed the survey—a response rate of 84.82%.

- Among them, 66.4% were female and 33.6% male.



**Chart 1**

- The students were spread across the 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> and final years (interns) of the program.

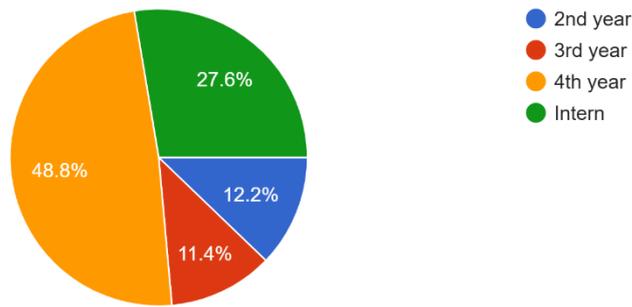


Chart 2

**Stress levels:**

- Here's what we found based on the 5-pointer scale:
  - \* 9% had no anxiety
  - \* 31.1% had slight(mild) anxiety
  - \* 35.2% had moderate anxiety
  - \* 14.8% had moderate to severe anxiety
  - \* 9.8% had severe anxiety

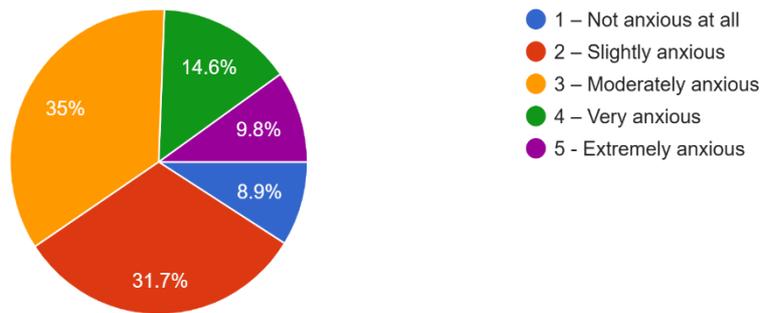


Chart 4

**Exam pattern stress:**

- Type of exam that create anxiety is as follows
  - \*Theory Exam (22%)
  - \*Practical/ Clinical Exam (38.2%)
  - \*Both equally (30.9%)
  - \*Neither (8.9%)

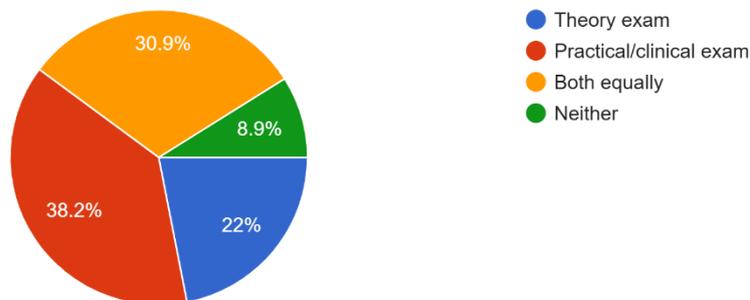


Chart 5

**Stressor Factors:**

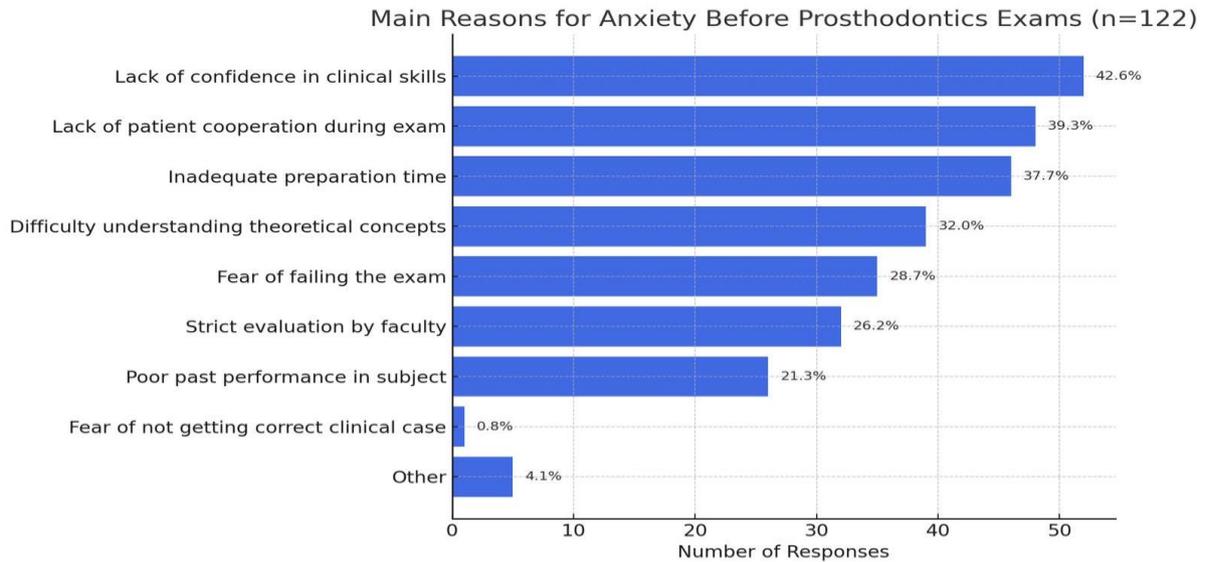
- The most commonly reported stress factors were:
  - \* Lack of confidence in clinical skills (nearly 42.6%)
  - \* Insufficient confidence in clinical abilities (about 42.6%)
  - \* Inadequate preparation time (almost 37.7%)
  - \* Difficulty understanding theoretical concepts (32%)

\* Fear of failing exams (28%)

Also, female students tended to report higher anxiety levels than male students, and this difference was statistically significant.

Main reasons for anxiety are shown in chart below.

**Table 1: Factors for anxiety during Prosthodontics Exam**



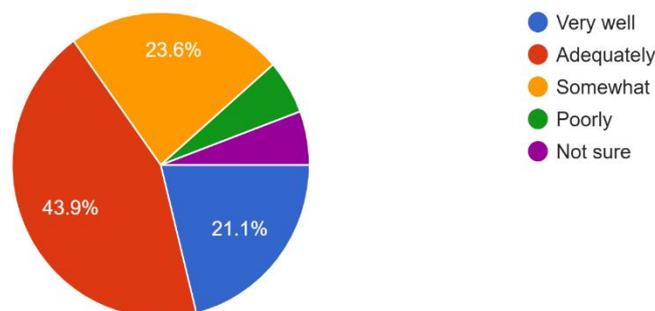
**Table 2: Characteristics of 122 respondents**

Variable	Category	No.	%
0 Gender	Male	41	33.6
	Female	81	66.4
2 Clinical Experience	Yes	65	53.3
	No	57	46.7
4 Total		122	100.0

**Teaching effectiveness:**

The effectiveness of teaching was rated as follows

- \*Not sure (5.7%)
- \*Poor (5.7%),
- \*Somewhat (23.6%)
- \*Adequately (43.9%)
- \*Very well (23.6%).



**Chart 6**

**Anxiety-related Symptoms:**

- Students experienced various symptoms of anxiety during exams

- \*Negative thoughts/self-doubt in 43.9% students.
- \*Heart racing in 39% students.
- \*Difficulty concentrating in 36.6% students.
- \*Sweating in 35.8% students.
- \*Insomnia before exams in 30.9% students.
- \*Nausea in 12.1% students.

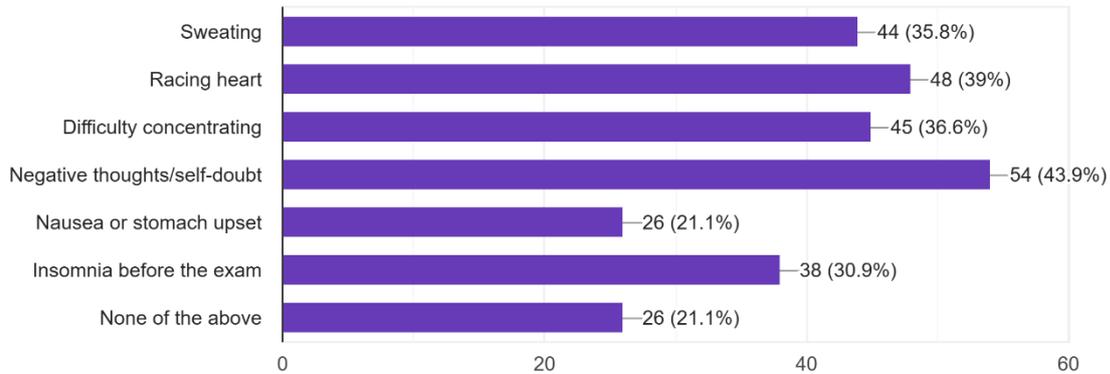


Table 3

Table 3: Table depicting responses of questionnaire

Questions	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7	Option 8	Total
1. Have you taken any theory or practical tests in prosthodontics yet?	Yes (84.6%) 104	No (15.4%) 19							n=123
2. Out of 5-point scale, how anxious are you before a prosthodontics exam (practical or theoretical)?	1 – Not anxious at all (8.9%) 11	2 – Slightly anxious (31.7%) 39	3 – Moderately anxious (35%) 43	4 – Very anxious (14.6%) 18	5 – Extremely anxious (9.8%) 12				n=123
3. Which kind of prosthodontics examination makes you feel the most anxious?	Theory exam (22%) 27	Practical/clinical exam (38.2%) 47	Both equally (30.9%) 38	Neither (8.9%) 11					n=123
4. Before your tests, did you have enough clinical experience in prosthodontics?	Yes (54.5%) 67	No (23.6%) 29	Somewhat (22%) 27						n=123
5. How effectively do you believe the prosthodontics department gets students	Very well (21.1%) 26	Adequately (43.9%) 54	Somewhat (23.6%) 29	Poorly (5.7%) 11	Not sure (5.7%) 11				n=123

ready for tests?									
<b>6. Do you think that your performance in prosthodontic tests is impacted by anxiety?</b>	Yes (47.2%) 58	No (24.4%) 30	Sometimes (28.5%) 35						<b>n=123</b>
<b>7. What are the main reasons you become anxious before prosthodontic exams? (Select all that apply)</b>	Lack of confidence in clinical skills (43.1%) 53	Difficulty understanding theoretical concepts (31.7%) 39	Inadequate preparation time (37.4%) 46	Strict evaluation by faculty (26%) 32	Fear of failing the exam (28.5%) 35	Lack of patient cooperation during clinical exams (39%) 48	Poor past performance in the subject (21.1%) 26	Fear of not getting correct clinical outcomes (0.8%) 1	<b>n=123</b>
<b>8. Have any of the following happened to you during a prosthodontics exam? (Select all that apply)</b>	Sweating (35.8%) 44	Racing heart (39%) 48	Difficulty concentrating (36.6%) 45	Negative thoughts/self-doubt (43.9%) 54	Nausea or stomach upset (21.1%) 26	Insomnia before the exam (30.9%) 38	None of the above (21.1%) 26		<b>n=123</b>
<b>9. What coping mechanisms do you employ to deal with exam anxiety in prosthodontics? (Select all that apply)</b>	Group study (41.5%) 51	Relaxation techniques (36.6%) 45	Speaking to a mentor or faculty (35%) 43	Avoidance or procrastination (23.6%) 29	Revising notes or textbook (40.7%) 50	Professional counselling (21.1%) 26	No specific strategy (25.2%) 31		<b>n=123</b>
<b>10. What kind of assistance do you believe might lessen your anxiety during a prosthodontics exam? (Select all that apply)</b>	More mock/practice exams (49.6%)	Better clinical exposure (60.2%)	Clearer exam expectations and guidance (48%) 59	Mental health workshops (30.9%) 38	One-on-one mentoring or feedback (26.8%) 33				<b>n=123</b>

## DISCUSSION

Anxiety is a common and deeply felt experience among Dental students, especially during Prosthodontics exams. These assessments don't just test theoretical knowledge—they also demand precision, clinical reasoning, and technical skill under time pressure. This combination creates a high-stress environment, and our findings echo what many previous studies have shown: students often feel overwhelmed, underprepared, and unsupported at critical moments in their education.

Most Dental students experience anxiety during Prosthodontics exams, with a significant number feeling moderate to severe levels. This stress impacts not only their performance but also their overall well-being. To help students succeed, Dental schools should provide more academic support, counselling services, and create a more encouraging learning environment—especially during high-pressure situations like exams.

As one study in Saudi Arabia showed, over 60% of students cited time constraints as a major stressor during both Preclinical and Clinical Prosthodontics exams <sup>[1]</sup>

Female students, for instance, were more likely to report trouble sleeping, issues with memory recall, and a sense of being overwhelmed right before exams.<sup>[12]</sup>

Anxiety isn't just about the exam content. It's also about how students prepare, how supported they feel, and even how they live day to day. For example, unhealthy eating habits and poor sleep were common among students experiencing high anxiety. Nearly 60% admitted that their diet and lifestyle deteriorated around exam season<sup>[13]</sup>

Another major factor is something known as **test competency**—essentially, how prepared students *feel*. Not how smart they are, but how confident they are in their ability to manage the content and format of the exam. Students who felt competent and supported were far less anxious, even when facing difficult<sup>[1]</sup>

It's clear that dental schools need to rethink how they prepare students for exams—especially clinical ones. Practical suggestions include:

- Offering **stress-management workshops** or group check-ins before exam periods
- Providing **realistic mock exams** that help students feel more prepared
- Ensuring **constructive feedback** during clinical rotations so students feel guided, not judged
- Exploring **two-stage exams** or collaborative assessments that reduce pressure while enhancing learning.<sup>[14]</sup>

This study, consistent with prior literature, found significant gender-based differences in how anxiety manifests. Female students were more likely to report **pre-exam insomnia**, **emotional distress**, and **rumination** about past performance. Males, meanwhile, were more likely to cite external factors like **distractions**, **lack of structure**, or **insufficient instructor support** as key contributors to their anxiety<sup>[12]</sup>

As per research by Baig et al. (2022), students who had insufficient preclinical exposure reported significantly more stress in clinical Prosthodontics procedures like crown preparation and post-space creation. Many felt that they were “thrown into the deep end” without adequate scaffolding<sup>[15]</sup>

A particularly insightful finding is the role of **test competency**—not intelligence—in shaping anxiety levels. Students who reported feeling well-prepared and competent experienced significantly less anxiety, even if they weren't at the top of their class. This supports the findings of<sup>[16]</sup>

While academic factors are often the focus, **lifestyle choices** have an underappreciated effect on anxiety. Several students shared that they skip meals, overuse caffeine, and sacrifice sleep during exam weeks—behaviours which are known to impair cognitive performance. One study found that students who maintained balanced nutrition and regular sleep were 32% less likely to report high anxiety levels before clinical exams.<sup>[13]</sup>

To better support students, dental schools could:

- **Incorporate mock exams** and simulation labs to help students become more familiar with clinical tasks under pressure.
- Provide **constructive, private feedback** instead of public critique.
- Train faculty in **trauma-informed and student-centered teaching**, so students feel guided rather than judged.
- Introduce **stress-reduction techniques**, such as breathing exercises or mindfulness, before high-stakes assessments.
- Explore **innovative assessments**—like two-stage exams or team-based clinical cases—to reduce isolation and boost collaborative learning<sup>[14]</sup>

## CONCLUSION

This study highlights the significant anxiety experienced by Undergraduate Dental students during Prosthodontics exams—a type of stress that goes beyond typical academic pressure. These exams challenge students not only intellectually but also emotionally and physically, especially as they transition into clinical roles that require precision and confidence under scrutiny.

The findings confirm that anxiety in this context is **multifactorial**. It is influenced by individual preparedness, perceptions of competency, fear of failure, time constraints, lack of instructor support, and even lifestyle habits such as sleep and nutrition. Gender-based differences and the jump from preclinical to clinical learning further shape how students experience and cope with stress.

Importantly, the study reveals that **perceived test competency**—how capable and prepared students feel—is one of the most critical factors in determining their anxiety levels. This suggests that interventions focused on building students' confidence, skills, and time management may be more effective than simply increasing academic content.

Dental schools and instructors should think about the following to address these issues:

- Providing more structured clinical preparation and mock exams
- Offering stress management resources and mentorship
- Creating a more supportive, less punitive clinical environment
- Rethinking exam formats to reduce unnecessary pressure

By making small but meaningful changes in teaching approaches and assessment design, Dental schools can help students not only perform better but also feel healthier, more supported, and more confident in their professional journey.

In conclusion, **exam-related anxiety is not a weakness—it is a signal.** A signal that calls for a more human-centered, balanced, and empathetic approach to Dental education. Addressing this will benefit not only students, but also the quality of patient care they go on to provide.

Based on what we found, here are a few ways Dental schools could help students manage their anxiety:

- \* Offer mock exams and practice sessions with supportive feedback
- \* Create safe spaces for students to discuss their fears or stressors
- \* Run stress management workshops before major exams
- \* Train faculty to give constructive rather than critical feedback
- \* Make mental health resources more widely available and visible.

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#### Author Contributions:

Siddhant Yadav was in-charge for the overall conception and design of the study They created the questionnaire, performed the literature analysis, and collected data. They also performed the data analysis and interpretation, and led the writing of the manuscript, including the discussion and conclusion sections.

Dr. Ajay Gaikwad who provided academic guidance throughout the research process. They contributed to refining the study design, supported ethical approvals, and provided critical feedback on the analysis and final draft of the paper.

#### Disclosure

The author declares **no conflicts of interest** related to the content, authorship, or publication of this research.

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