

Original article

Perceptions and Challenges Faced by Dental Students During Their Transition from Pre-Clinical to Clinical Training in the Conservative Department: A Cross-Sectional Study

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Abstract

A high level of stress among dentistry students is attributable to the fact that they need to obtain multiple abilities, such as theoretical knowledge, practical competencies, and interpersonal skills. The purpose of this cross-sectional study was to examine the perspectives and obstacles that fourth-year dental students have as they shift to clinical practice in conservative dentistry. Data was collected during the academic year of November 2024- February 2025 among fourth-year dental students at Tripoli University, Libya, and responses were automatically recorded using a Google Forms questionnaire. The results showed that most students were anxious about starting their first case (74%). This anxiety was more evident in the conservative treatment cases (21.7%), while most preferred to work with patients in the middle age group (20 to 40) (74%) to reduce anxiety and preferred to work with first-degree relatives. The primary concern expressed by students was a fear of damaging the patient's tooth (38.3%). There were also major problems with posture (33.2%) and handpiece use (29.8%). 47.2% of students expressed fear of unnecessary root canal treatment, while 43.8% were concerned about short-term filling failures. To reduce worry, 37% of students proposed the continual presence of supervisors, while 23.4% suggested higher work grades. Other suggested solutions included extending the preclinical phase (13.6%) and increasing case demonstrations (17.4%). The students were nervous about starting their first clinical cases, particularly the conservative ones. Most students appeared to be wary of working with children and the elderly, preferring to work with first-degree relatives. Their fear in the conservative area was that they might cause further damage to the tooth, such as requiring an unneeded root canal treatment, fracturing a filling, and needing to replace it, or exacerbating the patient's exhausting pain. They also mentioned concerns about using the handpiece or not being able to see clearly due to their location. Initiatives such as enhanced supervisory support and prolonged preclinical training can assist with this transition.

Keywords: Clinical Anxiety, Dental Students, Conservative Department, Handpiece.

Introduction

Dentistry is a science, a trade, and an excellent engineering career. It requires a thorough awareness of how to match the theoretical and practical aspects of the subject, as well as fine dexterity in putting it into practice [1]. Students choose dentistry as a profession because it allows them to work for themselves and choose their hours. Students should be made aware of the possibilities throughout their early college years [2]. Therefore, effective career guidance should be included in university curricula to enhance students' confidence in their future [3,4]. Dental students preparing for a professional career should not only study dental skills but also manage patients' fears and anxiety in children, adults, and the elderly.

There are some challenges that dental students face in clinics, which can be influenced by a variety of causes. These influences may be personal or institutional. Personal factors include being unable to effectively understand concepts, a lack of focus, the training atmosphere, meeting patient expectations, competitiveness, and frequent examinations [6]. However, other institutional factors include limited practical experience for students. As a result, gathering student feedback during teaching and training is critical to enhancing therapy and patient care [7]. Furthermore, the period of transition is quite difficult for a student who has recently begun clinical practice for a variety of reasons, including the vast variety of the training environment, the need to adopt new learning strategies, meeting patient expectations, and so on. This is why preclinical training with simulators is effective in improving students' creativity and facilitating a smooth transfer from preclinical to clinical settings [8].

Like any other university training program, dentist training varies internationally [9]. The difference in dental education affects graduates' knowledge and competence levels. Dental education includes basic sciences, preclinical training, and clinical training. Clinical-based training is required, with students performing patient work on actual patients during their training time, following each dental institution's guidelines. Dental college bachelor's degrees take between 4 to 6 years [10]. Any issues that arise during the training process can have an impact on the student's competence and confidence in clinical practice. To address these issues, dentists can use a variety of measures, including establishing confidence, gathering a thorough medical history, behavior control approaches, treatment planning, and decision-making. Understanding and dealing with these patient variables allows dentists to better discuss the obstacles of providing effective and caring treatment while avoiding litigation and improving patient safety [11].

The dentistry undergraduate degree (Bachelor of Dentistry Surgery) in Tripoli, Libya, consists of four years of dental training (3 years of preclinical and 1 year of clinical), followed by one year of internship. During the first three years of the BDS program, dental undergraduate students are trained in basic courses. They are introduced to clinical settings during their fourth year of BDS; the sudden shift from nonclinical to clinical settings without prior orientation can be frightful or challenging for them.

On the other hand, minimal worry is beneficial to students because it increases task orientation, concentration, alertness, and emergency responsiveness. Excessive anxiety, on the other hand, can be extremely burdensome, increasing the risk of sickness, reducing learning, decreasing performance, and undermining optimal healthcare delivery [12,13]. Recognizing worrying activities can help create a supportive learning environment that is conducive to clinical learning [9]. As a result, this study was done to investigate the challenges faced by undergraduate dental students during their clinical experiences at Tripoli University, Libya.

Methodology

This cross-sectional study aimed to assess the perceptions and challenges faced by fourth-year dental students transitioning to clinical practice in conservative dentistry. Data were collected via an online questionnaire distributed by email, using a convenience sampling method.

Data collection was carried out during the academic year from November 2024 to February 2025 among the students of the fourth year at Tripoli University, Libya, and responses were automatically recorded via Google Forms. The questionnaire, developed through literature review and expert input, included closed-ended and multiple-choice questions covering demographics, academic performance, clinical anxieties, supervisor preferences, patient-related concerns, and student-suggested solutions to reduce anxiety. A pilot test was conducted to ensure clarity and usability.

Data were exported to Excel and analyzed using SPSS version 25, employing descriptive statistics (frequencies and percentages). Participation was voluntary, anonymous, and based on electronic informed consent, with all data stored securely and handled confidentially.

Results

Among the 235 participants, the majority were female, representing 84.3% of the cohort. Regarding theoretical performance, 27.2% of students achieved an "Excellent" grade, while 50.6% obtained a "Very Good" grade, and 15.7% received a "Good" grade. In preclinical assessments, 31.9% of students were rated as "Excellent", whereas the majority (57.9%) attained a "Good" grade. A small proportion of students reported academic difficulties, with 4.3% having failed once in theoretical assessments and 2.6% experiencing failure in preclinical work (Table 1).

Table 1. Gender and Academic Performance in Conservative Dentistry

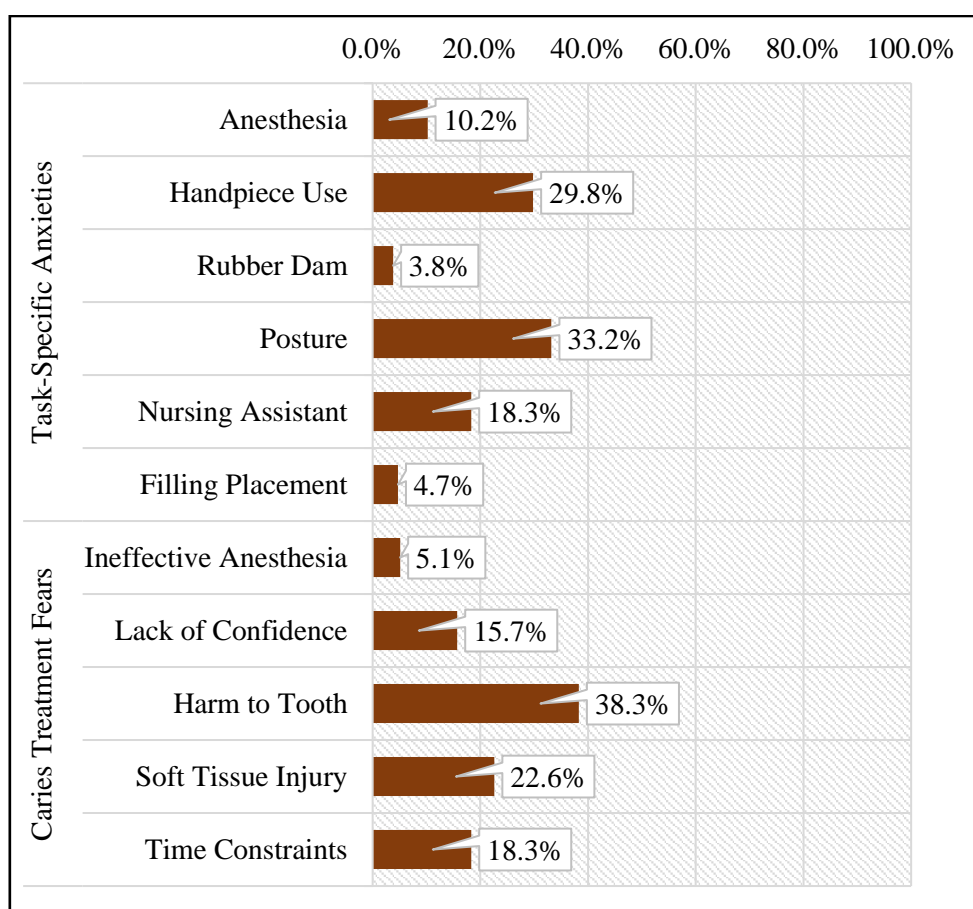
Category	Subcategory	Count	Percentage
Gender	Male	37	15.7%
	Female	198	84.3%
Theoretical Performance	Excellent	64	27.2%
	Very Good	119	50.6%
	Good	37	15.7%
	Failed Once	10	4.3%
	Failed >1	5	2.1%
Preclinical Performance	Excellent	75	31.9%
	Good	136	57.9%
	Failed Once	6	2.6%
	Failed >1	18	7.7%

Before beginning clinical work, more than a fifth (21.7%) of students expressed fear of the Conservative department, while nearly a quarter (25.5%) reported no anxiety about the clinical setting. The majority (74%) preferred treating patients aged between 20 and 40 years. More than a third (34%) indicated a preference for treating a first-degree relative (Table 2).

The most frequently reported concern was the fear of damaging the patient's tooth, expressed by more than a third (38.3%) of students. Difficulties with posture (33.2%) and handpiece use (29.8%) were also significant. Concerns about rubber dam usage (3.8%) and filling placement (4.7%) were reported at lower levels. Nearly a fifth (18.3%) of students were anxious about the involvement of a nursing assistant during procedures. For caries treatment, concerns included ineffective anesthesia (5.1%), while lack of confidence was noted by about a sixth (15.7%). Fear of soft tissue injury was a concern for more than a fifth (22.6%), while time constraints affected nearly a fifth (18.3%) (Figure 1).

Table 2. Pre-Clinical Anxieties and Preferences

Category	Subcategory	Count	Percentage
Department-Specific Fears	Conservative	51	21.7%
	Oral Surgery	41	17.4%
	Periodontology	38	16.2%
	Prosthesis	37	15.7%
	Pedodontics	8	3.4%
	No Fear	60	25.5%
Preferred Patient Age	<20 Years	39	16.6%
	20–40 Years	174	74.0%
	40–55 Years	8	3.4%
	>55 Years	10	4.3%
	Other	4	1.7%
Preferred Patient Type	First-Degree Relative	80	34.0%
	Other Relative	25	10.6%
	Stranger	74	31.5%
	Colleague	56	23.8%

**Figure 1. Procedural Anxieties in Conservative Dentistry**

Regarding supervisor presence, nearly half (43.4%) of students preferred constant supervision, while about a third (31.1%) preferred occasional assistance. A smaller proportion (19.1%) preferred active participation from supervisors, whereas a few (6.4%) reported that supervisors' involvement increased confusion (Table 3).

Table 3. Inquiries about the Supervisor

Category	Subcategory	Count	Percentage
Anxiety and Supervisor Presence	Constant Presence	102	43.4%
	Occasional Assistance	73	31.1%
	Active Participation	45	19.1%
	Increased Confusion	15	6.4%

Supervisor observations during patient care were a source of stress for nearly half (46%) of the students. Additional concerns included lack of cooperation from patients (18.3%), as well as patient agitation (14.9%) and time pressure (14%). Trust issues were noted by a small proportion (6.8%), as some students felt that patients did not fully trust their abilities.

In terms of worries during clinical work, a small proportion (6%) experienced hand trembling while administering anesthesia, whereas around one-sixth (16.6%) had similar issues when using the handpiece. Patient movement was a concern for nearly one-fifth (19%), while a smaller proportion (6.8%) feared they would not complete procedures on time. Over a third (36.2%) worried about over-preparing, while around one-sixth (15.7%) were anxious about incomplete caries removal (Figure 2).

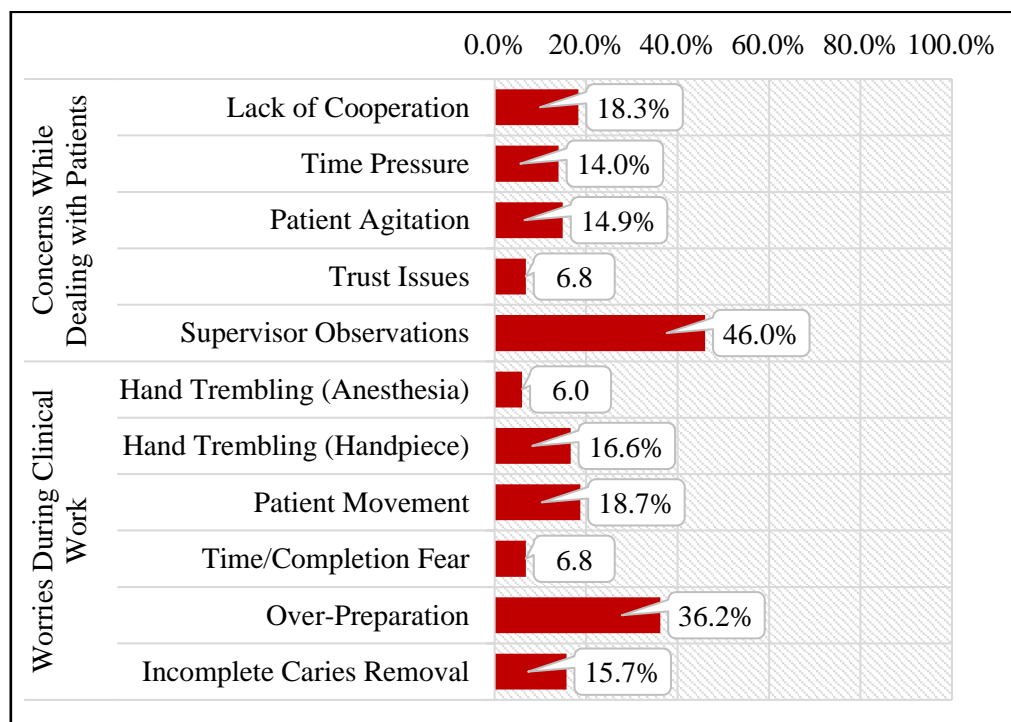


Figure 2. Inquiries About the Patient

Following treatment, fear of unnecessary root canals was reported by nearly half (47.2%) of the students, while concerns about short-term filling failures affected a similar proportion (43.8%). Additional post-treatment anxieties included increased pain (32.3%), improper filling height (15.3%), and the need for re-treatment (5.1%). Filling-specific fears included issues with material cost and choice, which were a concern for more than a fifth (21.7%), and discomfort due to filling height, which was reported at a similar level (20.9%). Contamination was a concern for a smaller proportion (13.6%), while fear of short-term re-treatment was reported by nearly half (43.8%) (Figure 3).

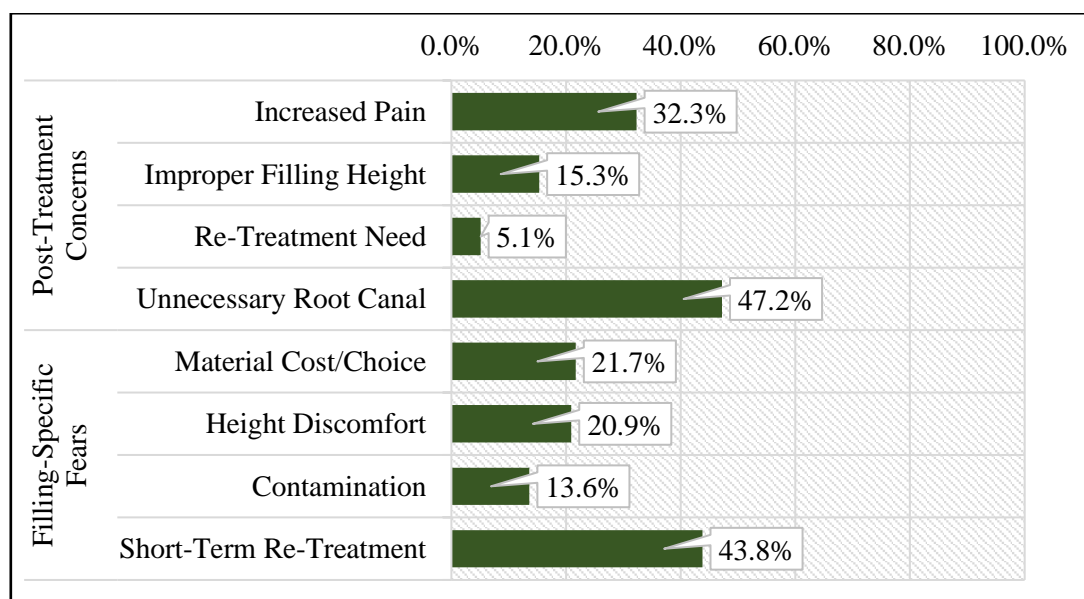


Figure 3. Post-Treatment and Filling Anxieties

To alleviate anxiety, more than a third (37%) of students recommended the constant presence of supervisors, while nearly a quarter (23.4%) suggested higher work grades. Other proposed solutions included extending the preclinical phase (13.6%), increasing case demonstrations (17.4%), and allowing students to start with relatives (8.5%) to build confidence (Table 4).

Table 4. Suggested Solutions to Mitigate Anxiety

Category	Subcategory	Count	Percentage
Potential Solutions	Supervisor Presence	87	37.0%
	Extend Preclinical Phase	32	13.6%
	Case Demonstrations	41	17.4%
	Start with Relatives	20	8.5%
	Increase Work Grades	55	23.4%

Discussion

The end of preclinical education and the start of clinical education can be considered a transition time. Students in the early stages of clinical training are worried about making mistakes and don't want to appear unprofessional in dealing with patients and supervisors [14]. The students' hesitancy and worry at the outset of the clinic phase, as well as the delay in commencing work on conservative treatment cases, stimulated our curiosity to discover the true reasons for their hesitation. We had multiple clinic discussions with the students involved, and their questions and worries were collected using past studies, resulting in this questionnaire. The current study found that students are more inclined to be anxious when communicating with elderly patients; the majority of students (74%) preferred treating patients aged 20 to 40 years, while the smallest percentage preferred treating elderly patients; this result was similar to that shown in Nigeria [15] and contrasted with results among New Zealand dental students, where dealing with the elderly is one of the least stressful situations [16]. The special level of respect and high regard for the elderly in Libyan culture and society may lead students to perceive it as a worrying situation.

Fear was unrelated to their elevated GPA or pre-clinical grades, as most students in the present study attained marks from very good to excellent. This study discovered that around 74.5% of students felt worried about starting their first cases. Furthermore, stress was discovered to be higher in the conservative clinical course (21.7%), oral surgery (17.4%), periodontology (16.2%), prosthesis (15.7%), and pedodontics (3.4%). This apprehension about beginning conservative treatment cases may be due to the sensitivity of working on composites and the need for complete isolation to avoid contamination with blood or saliva (13.6%), for example, or dealing with caries and the fear of not completely removing it (15.3%), in addition to the pain factor that may be exacerbated by intervention. In addition, fear of damaging the tooth, which we found to be a high percentage, and consequently, our transition to the root canal treatment stage (47.2%), which, if it fails, may lead to the loss of the tooth by extraction.

The current findings, similar to those of Mocny-Pachon´ska et al. [17] and Frese et al. [18], showed that the level of thought stress is much higher among students beginning clinical classes, particularly in the first weeks of these classes. According to Frese et al. [18], endodontic therapy is the most stressful, followed by restorative and periodontal treatment. In contrast to the findings in Poland [17], fifth-year students reported considerably lower levels of stress when conducting procedures related to diagnosis, caries treatment, and endodontic therapy than third- and fourth-year students. In the case of caries treatment, more than half of them felt a mild level of stress, whereas 16.1% did not find the procedures uncomfortable. Rajan et al. found different results on caries treatment, with undergraduate students reporting high trust in caries management and preventative care but poor confidence in oral medicine, pathologies, and dental emergencies [19]. Furthermore, there could be various causes for this unwillingness to begin conservative treatment. As the current study stated, the rated clinical fear-triggering scenarios in descending order are as follows: pulp exposure (38.3%), Difficulties with posture (33.2%), and handpiece use (29.8%) were also significant. Concerns about the involvement of a nursing assistant during procedures (18.3%). Fear of soft tissue injury was a concern for more than a fifth (22.6%), while time constraints affected nearly a fifth (18.3%).

The accidental pulp exposure necessitates a shift in treatment strategy from traditional restorative to challenging endodontic. The unpredictable nature of such exposure on pulp vitality and the patient's reaction when informed may explain why participants rated it as a stressful event. This high pulp exposure rating may also be explained by the high level of fear related to the high-speed handpiece used for cavity preparation (29.8%). Tension regarding accidental pulpal exposure was reported as fairly fearful in both the present study and the study of Lakshmi et al. [20]. In contrast to previous studies by Mikhail, C.R.G. et al. [21] and Gazal et al. [22], which showed that the most stressful dental situations included treating mentally unstable patients, dealing with medical problems, dealing with uncooperative patients, dealing with faint patients, fracturing a tooth, extracting the incorrect tooth, exposing the pulp accidentally, fearing the patient's satisfaction, cutting the cheek or lips after grasping a dental bur.

Furthermore, the present result disagreed with Obarisiagbon et al. [15], who discovered that the most prevalent clinical anxiety-inducing situations were dealing with mental patients, coping with recalcitrant patients, failing to complete prerequisites prior to exams, and failing final exams. Also, youngsters, patients becoming infected, a tooth shattering during extraction, extracting the incorrect tooth, the supervisor discovering calculus after scaling, unintended pulp exposure, harming patients by accident, and utilizing the high-speed handpiece [17].

Chair-side teaching allows you to use a patient case to help students apply what they already know in practice. It entails asking students questions that motivate them to participate in the learning process, promoting a deep approach to learning (McMillan, 2011) [23]. According to modern learning theories, students learn by developing their knowledge while actively participating in the learning process (Biggs, 2003) [24]. In this study, over half of the students (46%) found supervisor comments during patient care distressing. Nonetheless, nearly half (43.4%) of the students preferred constant monitoring, with roughly one-third (31.1%) preferring sporadic assistance. To improve students' confidence in beginning clinical cases, particularly in the conservative treatment department, and based on the students' own opinions, they believed their supervisors needed to be present throughout work on the patient (37%, in addition to increasing the marks by 23.4%). Other suggestions included extending the preclinical period (13.6%), boosting case demonstrations (17.4%), and allowing students to begin with family (8.5%) to boost confidence. Some of them wanted the supervising professor to work on the entire case in front of them. The levels of perceived stress and confidence among fourth- and fifth-year students during the preparation of cavities from deep caries and possible pulp exposure depend on the performed procedure, academic education, clinical training, the equipment and organization of the clinical room, vital pulp material, and the patient [17, 25]. It is important to highlight the Tripoli College of Dentistry's unique situation, including its location in a conflict zone and the long-term suspension of studies, which impacted student attendance and punctuality in college clinics, as well as the impact of the home quarantine period caused by COVID-19. This study's strengths include a multi-dimensional analysis of dental students' clinical transition, a validated questionnaire, and a sizable sample (n=235). Limitations involve sampling bias (gender imbalance, convenience sampling), single-institution focus, self-reported data, and cross-sectional design restricting causality. While findings highlight actionable solutions (e.g., enhanced supervision), future research should address generalizability through multi-center studies, longitudinal designs, and mixed-methods approaches.

Conclusion

Fourth-year dental students experience notable difficulties when transitioning to clinical practice in conservative dentistry. Common anxieties include performance worries, procedural fears, and discomfort with supervisory oversight. Despite strong theoretical and preclinical knowledge, students report concerns about tooth damage, time pressure, anesthesia effectiveness, post-treatment complications, and patient cooperation. These anxieties contribute to stress, potentially hindering the development of clinical competence and confidence. To improve this transition, strategies such as increased supervisor support, extended preclinical training, refined assessment methods, more frequent clinical demonstrations, and a gradual introduction to diverse patients, starting with familiar individuals, could be implemented. These measures aim to alleviate anxiety, build confidence, and enhance students' preparedness for clinical challenges.

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Conflicts of Interest

There are no financial, personal, or professional conflicts of interest to declare.

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