

Stressors in Dental Students During the Transition from Theory to Practice: A Qualitative Research

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ABSTRACT

Introduction

Dentistry is one of the most challenging, demanding, and stressful fields of study. Dental students are expected to acquire various skills, including academic, clinical, and interpersonal skills. This study aimed to investigate the stressors in students during the transition from theory to practice through qualitative research methods and ultimately improve curricula used for learning.

Methods

This cross-sectional study was performed on fourth to sixth year students of Kerman Dental School through interviews. Interviews related to the experienced clinical stress and challenges and experiences in the clinical environment were conducted with 40 students (16 males and 24 females) who were randomly included in the study and the participants' statements were recorded with their consent. The interview continued until the stage of information saturation and at the end it was confirmed by the participants in the study. Qualitative data were analyzed based on content analysis and then the data were classified.

Results

In this study, 8 people were in the fourth year, 16 people were in the fifth year and 16 people were in the sixth year. According to the statements and experiences of students, stressors such as reprimand and lack of time were the most common causes of clinical stress. Other factors, such as professors' attitudes and infection control, also had a significant effect on stress. Patient-

related factors such as not having a patient, their late or late arrival, and being harassed at work were also cited as causes of stress.

Conclusion

Many factors in the clinical environment play a role in the stress of dental students, which can be eliminated or reduced to greatly contribute to the quality of education. According to the results of this study and the recognition of stressors in the clinical environment, more attention of the authorities to this field and the need to review clinical education seems necessary.

Keywords: Stress, Students, Qualitative, Research, Interview

INTRODUCTION

The word stress, widely used today, was first defined in 1963 by Hans Selye¹. Essentially, stress is the body's response to any perceived demand, change, or threat, and the stressor is a situation or event that triggers that response²⁻⁴. Stress can also have a positive effect and provoke the person or have a negative effect and produce a feeling of being threatened⁵.

Today, it is known that stress or tension is the primary factor affecting mental health⁶⁻⁸. Among different groups of society, students experience high stress due to factors such as distance from the family, entering large and stressful groups, economic problems, low income, a large number of courses, and intense competition⁸.

Dentistry is one of the most challenging, demanding, and stressful fields of study. Dental students are expected to acquire various skills, including academic, clinical, and interpersonal skills^{9,10}. In recent decades, several studies have examined the sources of stress for dental students in different educational environments. Several factors that cause stress include workload, academic factors, clinical education, anxious patients, complex treatments, dealing with patients, and limited time to complete treatment^{11,12}. Thus, it can be argued that some stresses are inherent in medical and dental education and cannot be eliminated¹³.

Also, due to the close relationship between the dentist and the patient, the dentist considers himself responsible in terms of professional ethics, and the slightest unintentional mistake puts him under stress both emotionally and legally^{13,14}. In addition, the recognition of the transition from the theoretical to

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the clinical state has been reported in psychological education as a dynamic emotional and social process. Thus, although this transition to clinical education might be a specific period for personal and professional development, it might also be a source of stress and anxiety¹⁴.

In general, if persistent, stresses will have harmful consequences such as physical, psychological, and emotional effects, causing psychological complications, including depression, obsession, personality disorders, and feelings of inefficiency, anxiety, resentment, and boredom. In addition, stress-induced impatience might even lead to a lack of interest in the field of study¹²⁻¹⁴.

If stresses are not dealt with effectively, they can lead to psychological and physical symptoms and endanger health, with significant detrimental effects on individuals' health and efficiency. The most harmful effect of stress is disruption and impairment of effective performance, thinking power, and learning. In addition to the above consequences, students might show maladaptive habits and responses in the face of stress, such as smoking, alcohol abuse, medications, drug abuse, or suicide attempts¹²⁻¹⁴.

There are limited studies on transitional stress in dental students; however, significant stress and anxiety levels have been reported during their training period. In previous studies, the emphasis has been on the educational environment, and factors such as the influence of professors, communication with classmates, and communication with professors have not been considered¹⁴⁻¹⁸.

This study aimed to investigate the stressors in students during the transition from theory to practice through qualitative research methods and ultimately improve curricula used for learning.

METHODS

Also, before starting work, this dissertation was approved in the Ethics Committee of university with the code of ethics IR.KMU.REC.1398.478. The samples included all the fourth- to sixth-year dental students of Kerman Dental School. In this comprehensive functional study, in-depth group and individual interviews were conducted with several students. Students from the fourth, fifth, and sixth year were present in each group to homogenize the groups. Before the interview, oral consent was obtained from the students for their who inclusion in the research.

Forty students participated in this study 4 groups of 10, determined by information saturation. Twenty-four students were female, and sixteen were male. The participants were selected by contacting class representatives or talking to the individuals themselves. Aspects discussed in these questions include the student's readiness to enter clinics, their experience with patients and their management, any specific problems encountered in clinical sessions, and challenges related to going to the clinic. There were no right or wrong answers, and what the students shared did not affect their grades in any way, and students were assured that

all comments collected would be kept confidential and anonymous.

For a better interview, individuals were given the opportunity to express their views in full, and their experiences and attitudes were assessed. A trained researcher (a last-year student in the field of qualitative data collection (AC) conducted semi-structured interviews with participants. With the permission of the focus group participants, all audio conversations were recorded and no notes were taken during the interview, which in turn led to more focus on the participants' speech.

A pre-project interview guide was designed. In this guide, scientific literature extracted from other researches and clinical experiences of the interview team were used. However, the timing and schedule were not exactly the same for the participants because each participant had different behavioral ethics. For example, some spoke in such a way that there was no need to ask further questions during the interview, while some other participants spoke in such a way that the interviewer was forced to ask more questions. The interview was conducted very simply to allow participants to present their views and talk in more detail.

Data collection, copying, and data analysis were performed simultaneously to enable the design of a new topic and determine the achievement of existing theoretical saturation. Theoretical saturation was defined as information saturation, and the point of theoretical saturation is reached when no more interviews are added to the information required for a particular topic. The interview process was stopped when the researchers found that enough information was available to analyze and obtain students' views and beliefs.

A last-year dental student conducted the interviews. The text of the interviews was recorded as a tape. Then the subjects' opinions were immediately reviewed and coded separately by the two researchers immediately after the first interview and continued until the stage of data saturation. In addition, to increase the scientific accuracy of the study and determine its validity, the codes taken from each interview were again given to the participants to ensure researchers' perceptions of their opinions. Finally, data were analyzed based on content analysis, and the analyzed data were classified, and the number of respondents for each category was determined.

RESULTS

In this study, in-depth interviews were conducted with 40 students. There were 16 males (40%) and 24 females (60%). Eight were in the fourth year (20%), 16 (40%) were in the fifth year, and the rest were in the sixth year (40%). Table 1 presents the demographic characteristics of the participants in the study.

After encoding the data, the codes were classified. The codes related to the students, along with the number of responding groups related to each code, were as follows:

Table 1. Demographic characteristics of the participant

Semester	Sex	Age	No	Semester	Sex	Age	No
9	Female	23	21	7	Male	21	1
9	Female	23	22	7	Male	22	2
9	Female	22	23	7	Female	22	3
9	Female	22	24	7	Female	23	4
11	Male	23	25	7	Female	21	5
11	Male	23	26	7	Female	22	6
11	Male	24	27	7	Female	22	7
11	Male	24	28	7	Female	22	8
11	Male	23	29	9	Male	22	9
11	Male	25	30	9	Male	23	10
11	Male	23	31	9	Male	23	11
11	Female	23	32	9	Male	23	12
11	Female	24	33	9	Male	23	13
11	Female	32	34	9	Male	24	14
11	Female	24	35	9	Male	22	15
11	Female	26	36	9	Male	22	16
11	Female	28	37	9	Female	22	17
11	Female	24	38	9	Female	23	18
11	Female	24	39	9	Female	24	19
11	Female	25	40	9	Female	24	20

- Stress on the first day in a faculty department⁴
- Stress in dealing with professors⁵
- Stress due to doing the wrong thing³
- Stress due to non-compliance with infection control⁵
- Stress of not having a patient in different departments⁴
- Stress of lack of time⁶
- Stress of being reprimanded⁶
- Stress of the lack of equipment⁴
- Stress of patient harassment during treatment⁴
- Stress of injury by needle stick⁴

To better understand the issues and clarify stress types, the cases were divided into stresses related to patients and lack of education, stresses related to clinical treatment, and stresses related to professors.

Stresses related to unfamiliar clinical treatments or lack of education

- As students entered some departments, they reported information gaps related to unfamiliar clinical treatments or lack of education.
- Unawareness of how to deal with the patient
- Being unfamiliar with the principles of infection control
- Lack of education about the rules of the department or obtaining the necessary information in each department.

Students' remarks

- I did not know what I should have known, and I did not know the right thing to do. When we go to the clinic, we still do not know anything about radiography.
- When I do something for the patient for the first time, I do not know whether it has a good result or not! Each department is different in terms of infection control and work routines, which is also

true for professors because each professor has their own system and expects the student to follow that system.

Stresses related to clinical treatments and departments The stress of doing the wrong thing leads to a confrontation with professors.

Students' remarks

- In the surgical department, if we break a root or the residual root is left in place, we will be reprimanded, and it might even lead to the lesson being dropped.
- In the endodontics department, overfilling or having voids in the obturation, using a single gutta-percha cone, breaking a file inside the root canal, or perforating a root canal are considered disasters.
- If we do something wrong in some departments, they will impose heavy fines on us, unlike other universities that do not impose these fines.
- Early on, I was afraid of not achieving anesthesia. It is always stressful for me when my patient gets worse, and I cannot control the situation.
- It is stressful every time I face a new situation, and I do not know how to treat the patient. If I do something for the patient that eventually fails, it puts a lot of stress on me.
- In the endodontic department, we have the stress of accessing, and in the filing stage, the stress is that the root canal is calcified.
- The restorative department also has the most significant concern about reaching the pulp. The main problem is an incorrect injection technique because we have not given many injections.

Stresses related to not being enough patients or specializing in patients' treatment

Students' remarks

- It is difficult to find patients whose treatment can be managed by undergraduate students in the orthodontics department. Also, because of the long waiting period, sometimes, patients refer to private offices and clinics and do not wait for their turn.
- In some departments, such as endodontic and prosthetics, it is difficult to find a patient, and even after finding the patient, he/she might be specialized, which wastes a lot of time and causes a lot of stress.
- For me, the biggest stress has always been finding a patient, especially in endodontics, or if, for example, the course lasts a week, when we find a patient in the last days, we have to carry out the procedure quickly because adding extra days leads to trouble.

Stresses related to lack of time

Students' remarks

- Working in the department is very different from working in the phantom clinic, and in departments such as endodontics and prosthodontics, we are always worried about time pressures.
- In some departments, such as endodontics, students in the last rotation of the semester might not be able to fulfill their requirements.
- If we have a complicated procedure, we have to spend a lot of time on it, which might lead to an unfinished or even dropped score.

Stresses related to equipment and materials

Students' remarks

- The material room of departments, especially the complete denture section and endodontic, is very annoying. They do not deliver the items on time, or they constantly complain.
- Equipment is not adequate; for example, most of the handpieces in the endodontics department are broken, and when we protest, they tell us to bring our own equipment.
- Sometimes the equipment is not clean, and we are worried that it will harm the patient and us.
- Some units in each section are damaged, making it impossible to carry out the procedure. In addition, we might have to spend a lot of time repairing the unit, leading to unfinished treatment, which often happens in the endodontics and restorative departments.
- I am always afraid that I might not have fully prepared the equipment, and I have forgotten something in the set or have not sterilized my equipment.
- One of my biggest stresses, especially in endodontic and restorative procedures, is finding an empty unit. It is a problem to find a unit for the patient.
- Damaged handpieces or limited equipment such as apex locators are a problem; I have to wait for others to finish using them.

Stresses related to professors

Students' remarks

- Behavior of Oral Medicine Professors Because I have heard that the professors of this department behave seriously.

- The main problem is the professors who arrive late, especially in the prosthetics department, which causes patient complaints and delays in the treatment process.
- Another problem is the different opinions of endodontic professors; the procedure is carried out in several stages with several professors, and none of them accepts the other's opinion.
- The stress in the pediatric department is due to children's behavior and their fear of a particular professor. Some professors do not start the class on time or finish it on time, making it impossible for us to be present in the oral disease department on time.
- Sometimes we have to wait for a long time for our professors in the clinic. Naturally, this complicates the treatment process, and the patient has to wait for a long time, making them angry.
- Professors' personal animosities that cause additional stress.
- Most professors think that students know everything perfectly and expect the best from us.
- In some departments, any wrongdoing will eventually lead to receiving a severe reprimand.
- I have always been confident in my work since I entered the clinical course. The only fear I had was the fear from the professor because sometimes the professor causes stress with a series of inappropriate attitudes. For example, in the restorative department, the professor asked me to remove caries, and when I removed it, the professor said, "Why did you remove it so much?" And when I told him that I did what you said, he did not believe or reacted as if he did not believe me. I was worried that I might not pass this course. This means that the professors do not trust the students. Of course, they are right in some cases because some students do not care about the patient, but the patient is important to me personally. Unfortunately, no matter how respectful I am to the professors, they still show a certain attitude.
- This is the case only in our school: education is insufficient, and the student himself must how to treat the patient by trial and error. Another reason is that the professors are not effectively present in the department, and no one supervises the student.
- The concern was to get signatures and approvals. I was doing the treatment, but because the professor left the department sooner, I could not get the signature, and the next session I had to show the whole thing so that I could remind the professor. The next point is that some professors did not trust at all, and some of them trusted so much that they left the patient to our care and did not supervise at all.

Patient-related stress

Students' remarks

- The patient does not arrive on time or refuses to continue treatment after completing some steps.
- Patients expect treatment to be done in one session, or to take less cost, and we will have to tolerate for fear of losing the patient, or we will have to pay part or all of the expenses that the patient has to pay.
- Patients ask why their prosthetic treatment is not finished; they hope to treat many teeth in a single session and minimize the number of visits.
- Sometimes the patient is bothered or experiences

severe pain during treatment, but we are not allowed to re-anesthetize.

- Some patients do not pay for their treatment and leave the faculty, which causes us to pay for it ourselves.
- The patient gets tired during treatment, which increases the number of treatment sessions.
- When we ask the patient to do a laboratory test, he or she often refuses it.

DISCUSSION

This study investigated the stresses of attending clinical departments in Kerman dental students through interviews. The results of this study showed that the most common factors that caused stress in students. These factors include the first day of entering the department, the professors' behavior, doing the wrong thing, lack of infection control, a lack of patients in different departments, lack of time, being reprimanded, lack of equipment, harassing the patient during treatment, and needle stick injuries.

Studies show that studying dentistry can be very stressful¹¹⁻¹⁴. It can be argued that some stresses are part of the nature of medical and dental education and cannot be eliminated¹⁹⁻²³.

However, recent studies have shown that dental students experience much higher stress levels than medical students^{24,25}.

Studies show that the most stressors are exams and grades, clinical procedures and patient management, completing clinical assignments, student-professor interactions (how teachers treat students such as cold behavior, insignificance, lack of encouragement), discrimination between male and female students, criticism, and excessive expectations from students), student relations with staff and other students, meeting the expectations of family and friends, responsibility for treating patients, managing non-cooperative patients, fear of contracting infectious diseases in the department, a lot of patients to treat and lack of free time^{21-24, 2-4}.

A study on dental students in Babol²⁶ showed that dental students experienced moderate stress, consistent with a study by Dalband and Farhadinasab in the School of Dentistry, Hamadan University of Medical Sciences¹⁹. Naidu et al. (2002)²⁷ and Morse et al. (2007)²⁸ reported that the overall average stress experienced by dental students was moderate. Such similarities in the results are probably related to the dental curricula and the similar educational system in this university with the mentioned universities.

The present study showed that the most stressful department were endodontics, oral diseases, and surgery, and the least stress was related to the periodontics department. Even in the statements of some students, the periodontics department was mentioned as stress-free. It is noteworthy that the mistakes and behavior of the professors caused stress in the students.

In a 2009 study of 307 dental students at two dental schools in Jordan, Badran et al reported that surgery and endodontics departments had the highest stress levels²⁹. After the study, the officials asked the two mentioned department to make changes in their educational system. It should be noted that their results in high-stress conditions were related to the endodontics department similar to ours, which indicated the high level of stress for dental students in this department, regardless of the university. This might be due to the high level of difficulty in endodontic procedures due to the indirect vision, poor patient cooperation, etc.

Argypolychronopoulou and Divaris (2005) assessed and compared stress levels in 337 dental students and reported that they all complained of a lack of enough time for exercise and rest³⁰. In a 2009 study, Kumar et al. reported that the main stressors were workload and the large volume of study content³¹.

Polychronopoulou and Divaris, in a 2005 study in Greece, reported "test scores" and "inability to fulfill the requirement" as the main stressors³⁰.

A study examining the stress of dental students at the University of Jordan reported that the most common stressors were a lack of time and patients' late arrival or failure to arrive for their appointments. Comparison with previous studies also showed that Jordanian dental students perceived stress more than other students for matters related to the educational environment and personal or cultural aspects³².

Research at the University of Manchester on dental students also showed that the highest-scoring factors varied throughout the course. However, exams, fear of failure in the course or year, shorter and fewer vacations than other university students, and the quantity and variety of work in a limited time were the most common³³.

A study of dental students at the University of Greece found that the amount of work in the classroom (82%), exams and grades (76%), lack of self-confidence to become a dentist, completion of graduation requirements (68%), deficiency in dedicated time to school (64%), and lack of time to rest (64%) were the most common causes of stress³⁰.

The most important stressors in Nigeria were the lack of a good education system and dental support in terms of the availability of materials for clinical education and study materials³⁴.

In India, most cases of stress were in fourth-year students, except treating patients with dirty mouths which showed higher levels of stress in the third year, because education on real patients actually begins that year³⁵.

Some stressors among South African dental students included the educational environment, fear of failure, heavy workload, problems dealing with patients, curricula, and challenging relationships with university staff³⁶.

In Malaysia, the lack of cooperation between professors and patients caused stress in students. In addition, students were concerned about inconsistent feedback from their professors³⁷.

In a study in Mashhad, seven factors had a significantly higher mean score in students with abnormal stress levels than students with normal stress levels. These factors include fear of failure to complete the requirement on time, the high workload in the faculty and lack of free time, discrimination between students by professors, inadequate educational planning and unit selection, discrepancies in the training of different professors of a department, dissatisfaction with the evaluation of clinical performance by professors and failure to meet the needs of students by officials³⁸.

Dental education is a challenging learning experience. As a dentist, students are expected to learn the theoretical and practical aspects of the dental curriculum in addition to dealing with patients. It has also been reported that dental students experience a higher level of stress than medical students, which is justified by the additional psychological skills required in dentistry²⁴.

The results of a study on students in Shiraz³⁹ showed that students experience normal stress levels. However, a previous study showed that dental students experienced moderate stress in the educational environment, indicating a stressful education environment in the dental school³⁸. In addition, the levels of depression, anxiety, and stress of students in this study were approximately half those of students in a previous study⁴⁰.

Other issues that caused stress in students in this study were professors' attitudes and sometimes discriminatory attitudes. In a study in Shiraz³⁹, researchers showed that the atmosphere created by professors in the clinical environment and the criticism that students received from faculty members in the presence of the patient were the factors that played an important role in creating stress for dental students.

In this study, exams were not mentioned as stressors, unlike other studies^{41-46,27,23,20,35,32, 33,30}

Lack of clinical time, completion of clinical requirements, problems in managing difficult cases, and disagreements between professors about clinical treatments were other major causes of stress. According to Kumar et al.⁴⁷ and Asharia³⁵, the "requirement system" in education has been identified as a stressor in Indian studies. If the emphasis is shifted from the number of completed cases to the quality of completed cases, it can reduce stress in students. In addition, the skills needed to manage a patient should be part of the curriculum. This increases students' self-confidence and self-efficacy beliefs in dealing with patients³⁴.

Stressors are mainly related to the nature of education, and we are faced with the side effects of high stress on students' health and well-being⁴⁸. A study by Hawazin et al showed that lack of clinically allocated time, lack of time to rest and reduced vacations, full working day, receiving criticism from supervisors about academic or

clinical work, the degree of fraud in the dental school, the rules and regulations of the school, and the fear of unemployment after graduation are also mentioned as frequent stressors⁴⁹.

In a similar study that assessed dental stressors in students at the University of Manchester, Heath et al.³³ found that potential stressors included (1) information overload (2), fear of incompleteness and diversity of work, (3) inadequate and contradictory feedback on performance (4), and proximity to faculty and staff.

George et al.⁵⁰ showed a relationship between the personalities of dental students and stress levels. A study on Australian dental students showed that stress is due to a tendency towards perfectionism, based on a history of high progress and strong educational expectations⁵⁰. According to Dodge et al.⁵¹, students report significantly less stress when clinical training and evaluation are not based on the requirement. According to a study by Schwartz et al.⁵², the establishment of student counselors and counselors in a dental school with a student-centered counseling system and knowledge-based programs promotes an advanced learning environment. Hence, a stress reduction program should be implemented with particular attention to women.

It seems that modifying the curriculum and environment, as well as adopting stress management strategies and providing resources, will help reduce stress in dental education and students' success.

However, some stressors seem to be inherent in vocational training and have a wide range of dental implications. Therefore, a modern dental school must effectively manage potential sources of stress to promote the educational and professional health of its graduates. Identified factors should be considered in combination with stress management measures to reduce the chances of mental fatigue and improve students in a healthy and stress-free environment. Modifications in curriculum and teaching methods, emphasis on active quality learning, modular teaching, descriptive assessment not just summary assessment, and reducing the focus on requirements have been suggested by academics as a way to reduce stress.

CONCLUSION

Many factors in the clinical environment play a role in the stress of dental students, which can be eliminated or reduced to contribute significantly to the quality of education. However, according to the results of this study and the recognition of stressors in the clinical environment, authorities should pay more attention to this field and review clinical education.

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Conflict of Interests

Authors have no conflict of interest.

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