

Preparedness and Anxiety of Dental Students in the Transition from Preclinical to Clinical Practice

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Abstract

Aim This study aimed to investigate the preparedness and anxiety levels of dental students transitioning to clinical practice and to examine the effects of sex, university, and observations.

Material and method A total of 182 students (58 males, 124 females) transitioning from preclinic to clinic participated in the study. The survey consisted of sections covering socio-demographic data, students' opinions on their preparedness for clinical practice, anxiety levels measured by the State-Trait Anxiety Inventory (STAI), and confidence levels in various skill areas. Spearman's Rank correlation test was used for correlation analysis, while the Mann Whitney-U test for pairwise group comparisons.

Results No differences were found in preparedness between sexes, but males exhibited significantly higher confidence in various dental skills. Conversely, females reported significantly higher levels of state and trait anxiety. State university students (n=48) reported heightened workload expectations and elevated levels of state and trait anxiety. Conversely, private university students (n=134) demonstrated increased confidence and preparedness in dental practice-related knowledge and skills. Students who participated in observations (n=96) had lower preparedness and confidence levels in several dental areas, coupled with higher trait anxiety levels, compared to their peers who did not participate in observations (n=86). Finally, STAI scores were positively correlated with workload, negatively correlated with knowledge, skills, and confidence.

Conclusion Sex, school, and observation status have an impact on students' preparedness for clinical education, anxiety, and confidence in their professional abilities. Therefore, assessments and orientation programs that take these aspects into account can benefit students at this time of change.

Keywords Anxiety, Clinical competence, Dental education, Dental students, Undergraduate

Introduction

Becoming a dentist entails a long and challenging journey that requires a significant investment of time, effort, and dedication. In Turkey, a five-year dental school program combines theoretical and practical education. The first three years of the program are devoted to preclinical education while the remaining years are predominantly devoted to practical training in clinical settings. However, the practical training conducted in preclinical laboratories is insufficient to provide students with sufficient experience in patient communication, infection control, and clinical procedures. On the other hand, clinical training encompasses more than three-quarters of the dental curriculum and is designed primarily to develop the psychomotor skills necessary to perform dental procedures. At the end of this training, dental students are expected to have acquired a range of competencies, including scientific, clinical, and interper-

sonal skills (1, 2).

Traditionally, learning and skill development take place in learning environments including the classroom, seminar, clinic, and peer interactions. The students' manual skill development begins with simulated bench-top operations and techniques utilizing dental mannequins before the start of the clinical training (3). The purpose of preclinical dental education is to prepare students for clinical instruction (4). The competencies gained in preclinical training can affect the person's clinical performance and self-confidence. Confidence has been regarded as context-specific and as a predictor of academic success, and its definition is "freedom from doubt; belief in yourself and your abilities" (5). According to one study, clinical practice among dental students improved when their self-confidence rose (5). In order to get a better understanding of dentistry education and associated issues, it is crucial to ascertain students' self-confidence and perceptions of their preparedness throughout this transitional period. This period in dental education has been reported to be an emotionally and socially dynamic process (6). While this transition represents a significant period of personal and professional development for dental students, it can also be a source of stress and anxiety (7-9). It has been noted that students experience a marked increase in workload and a consequent lack of time for study as they enter clinical training. The sudden transition of students into this new, challenging, and exciting clinical environment can lead to feelings of uncertainty, inadequacy, and anxiety due to not knowing what to expect and

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feeling unprepared. This situation can also affect students' academic motivation levels and performance. Moreover, students may experience anxiety due to negative thoughts regarding their level of knowledge, clinical competence, ability to communicate with patients, financial resources, and interactions with clinical staff (9). Consequently, they may engage in faulty behaviors and perform inadequate treatments. Numerous studies have reported significant levels of stress and anxiety among dental students throughout their general education period, with worrisome prevalence and intensity of symptoms related to psychological morbidity, depression, and burnout (6,10,11). However, no research specifically addresses the anxiety experienced during the transition to clinical education and the impact of sex, observational status, and university on these concerns.

Observation plays a significant role in the process of learning and skill acquisition, which can have implications for the challenges encountered by students during the transition to clinical education. Previous studies have demonstrated that observation is a crucial factor in the development of cognitive and motor skills (12). Information acquired through observation can assist students in enhancing their clinical skills and feeling more prepared in a clinical setting. Additionally, it has been suggested that observation may increase students' self-confidence and alleviate anxiety associated with clinical experiences (13).

By elucidating the concerns, and anxiety levels of students during the transition from preclinical to clinical practice, valuable insights can be gained that may lead to the development of anxiety-reducing solutions.

Therefore, the objective of our study was to evaluate students' perceptions of their clinical preparedness and self-confidence, as well as their degrees of anxiety as they moved from preclinical to clinical training in dental education. Moreover, the present study aimed to examine the effect of sex, observational status, and university of the students on these evaluated parameters. To the best of our knowledge, there is no existing study conducted on this topic in Türkiye.

Material and Methods

This cross-sectional study was conducted between August 2022 and October 2022. Ethical approval was obtained from Biruni University Non-interventional Clinical Research Ethics Committee (25.02.2022 and 2022/67-09, Istanbul, Türkiye). In the absence of official statistics on the number of students completing the 3rd grade in Türkiye, a formal sample size calculation was not feasible. Therefore, the study aimed to reach the entire population of 3rd-grade students, as targeting the entire population can be a valid approach in survey studies when sample size calculation is not possible. The questionnaire was distributed to the dean offices of all public and state universities in Türkiye, with the objective of reaching all students who had completed their third year of dental school. Dental students who had completed their third year of study were invited to participate in an online or paper-based survey distributed on campus. The online version was prepared using Google Forms and distributed electronically via social media. To avoid potential biases, the online forms were designed to ensure each participant could only respond once. The survey used

a forced-choice format to minimize missing data. Prior to participation, all individuals were given detailed information about the study, and only those who provided online or written informed consent in compliance with the 1964 Helsinki Declaration and its later amendments were allowed to proceed with the survey. To maintain anonymity, no personal information was collected from any participant.

The survey consisted of four sections. The first section included socio-demographic data such as the age and sex and observation status of the participants. To determine observation status, students were asked whether their training curriculum included clinical observation, and students who voluntarily observed in their own faculty or other clinics were excluded from the study. To address the disparities in the initiation of clinical practice among different faculties, the questions "Have you ever conducted procedures on patients in a clinical setting?" and "During the academic year 2022-2023, will you be studying in the fourth grade?" were employed. The students with prior clinical experience who had not finished their third year were not included in the study.

The second section of the study focused on students' opinions about their preparation for clinical practice in five categories: professional socialization, workload, patient contact, knowledge and skills, and learning and education. The questions in this section of the survey were adapted from those used in the study by Prince et al. (4) and are presented in Table S1. Participants were asked to indicate the extent to which they agreed with each statement on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree).

The third section of the survey which was based on the study of Lynch et al. (10), evaluated students' confidence levels in sixteen main skill areas (Table S2). Confidence levels were rated on a 5-point Likert scale, with 0 representing no confidence and 4 representing very high confidence.

The final part of the survey consisted of the State-Trait Anxiety Inventory (STAI) developed by Spielberger et al. (11) to assess both state and trait anxiety (Cronbach's α of 0.87). The Turkish version of the STAI was distributed to all students, who were required to have a certain level of Turkish proficiency before entering the clinic, with the permission of the author who adapted it to Turkish (14). The inventory has two separate scales, each comprising 20 items, which are rated on a 4-point Likert scale. The first scale, STAI-State (STAI-S), measures the level of state anxiety experienced at a given moment and under certain conditions. The second scale, STAI-Trait (STAI-T), measures the individuals' overall level of anxiety in relation to their general life circumstances, regardless of specific situations or conditions.

Statistical Analysis

Number Cruncher Statistical System (NCSS) 2007 software (Kaysville, Utah, USA) was used for the statistical analyses. Descriptive statistical methods (Mean, standard deviation, median, frequency, minimum, and maximum) were used. The Shapiro-Wilk test was used to check whether a continuous variable followed a normal distribution. The Mann-Whitney U test was used for independent pairwise comparisons. Spearman's correlation analysis was used to determine the relationship between quantitative variables. A p-value <0.05 was considered statistically significant.

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Results

A total of 182 students completed the survey. Eighty-three students responded to the online version of the questionnaire, while 99 students responded to the paper version of the questionnaire. The mean age of the participants was 21.94±1.2 years. Of the participants, 68.1% were female (n=124) and 31.9% (n=58) were male.

Table 1: Opinion, Confidence and Anxiety Levels of Students According to Sexes

	Total (n=182)	Male (n=58)	Female (n=124)	p ^o
	Mean± SD Min-Max (Median)	Mean± SD Min-Max (Median)	Mean± SD Min-Max (Median)	
Opinions about preparation for clinical practice				
Transition and Professional Socialisation	3.4±0.34 2.33-4.5 (3.42)	3.37±0.37 2.33-4.17 (3.33)	3.41±0.32 2.58-4.5 (3.42)	0.565
Workload	3.55±0.75 1.33-5 (3.5)	3.46±0.63 2.33-5 (3.5)	3.59±0.8 1.33-5 (3.58)	0.219
Patient Contact	3.65±0.48 2.33-5 (3.67)	3.56±0.55 2.33-4.67 (3.67)	3.69±0.43 2.5-5 (3.67)	0.106
Knowledge and Skills	3.37±0.51 2.17-5 (3.33)	3.47±0.48 2.5-4.67 (3.42)	3.33±0.53 2.17-5 (3.33)	0.110
Learning and Education	4.03±0.38 2.85-5 (4.08)	4±0.41 2.85-5 (4)	4.05±0.37 2.85-4.69 (4.08)	0.227
Confidence				
Diagnosis	2.74±0.91 0-4 (3)	2.95±0.98 0-4 (3)	2.64±0.87 0-4 (3)	0.017*
Radiography	2.74±0.96 0-4 (3)	2.98±0.95 0-4 (3)	2.62±0.94 1-4 (3)	0.009**
Treatment Planning	2.69±0.99 0-4 (3)	2.83±1.03 0-4 (3)	2.63±0.97 0-4 (3)	0.136
Pain Control	2.76±1.01 0-4 (3)	2.93±0.99 0-4 (3)	2.68±1.02 0-4 (3)	0.083
Managing Dental Emergencies	2.18±1.2 0-4 (2)	2.38±1.21 0-4 (3)	2.09±1.18 0-4 (2)	0.097
Prescription of Antibiotics	1.9±1.3 0-4 (2)	2.12±1.3 0-4 (2)	1.8±1.29 0-4 (2)	0.117
Management/Understanding of Occlusion	2.5±1.22 0-4 (3)	2.74±1.24 0-4 (3)	2.39±1.2 0-4 (2)	0.055
Preventive Dentistry/OHI	3.27±0.84 1-4 (3)	3.31±0.86 1-4 (4)	3.25±0.83 1-4 (3)	0.540
Periodontics	2.66±1.01 0-4 (3)	2.78±1.02 0-4 (3)	2.6±1.01 0-4 (2.5)	0.179
Removable Prosthodontics	2.01±1.16 0-4 (2)	2.15±1.17 0-4 (2)	1.95±1.16 0-4 (2)	0.308
Oral Surgery	2.2±1.12 0-4 (2)	2.47±1.11 0-4 (2.5)	2.08±1.1 0-4 (2)	0.022*
Patient Management	2.6±1.01 0-4 (2.71)	2.64±1.07 0-4 (2.86)	2.57±0.98 0-4 (2.57)	0.529
Restorative Dentistry	3.05±0.85 0.33-4 (3)	3.27±0.8 1-4 (3.67)	2.95±0.86 0.33-4 (3)	0.018*
Endodontics	2.8±0.99 0-4 (3)	3.22±0.84 1-4 (3.33)	2.6±1 0-4 (2.67)	0.001*
Indirect Restorations	1.88±1.22 0-4 (2)	2.19±1.24 0-4 (2)	1.74±1.19 0-4 (1.67)	0.029*
Bridgework	1.89±1.24 0-4 (2)	2.09±1.22 0-4 (2)	1.8±1.24 0-4 (2)	0.134
Anxiety				
State Anxiety	45.41±13.08 20-80 (45)	41.88±12.69 20-73 (41)	47.06±12.99 20-80 (47)	0.013*
Trait Anxiety	44.74±10.78 22-77 (44)	42.14±10.59 23-77 (42)	45.96±10.69 22-76 (45.5)	0.031*

OHI: Oral Hygiene Instructions, SD: Standard Deviation. #Mann Whitney-U test ; *p< 0.05, **p<0.01.

The percentage of participants studying at state universities was 26.4% (n=48; 32 females and 16 males), while the percentage of those studying at private universities was 73.6% (n=134; 92 females and 42 males). In addition, the number of students who could make observations in their schools was 96 (52.7%), and there were 86 participants who could not (47.3%).

Table 2: Opinion, Confidence and Anxiety Levels of Students According to University

	State University (n=48)	Private University (n=134)	p ^o
	Mean± SD Min-Max (Median)	Mean± SD Min-Max (Median)	
Opinions about preparation for clinical practice			
Transition and Professional Socialisation	3.4±0.37 2.33-4.5 (3.33)	3.4±0.33 2.5-4.42 (3.42)	0.810
Workload	3.93±0.78 2-5 (3.92)	3.41±0.69 1.33-5 (3.33)	0.001**
Patient Contact	3.67±0.48 2.33-5 (3.67)	3.65±0.47 2.5-5 (3.67)	0.831
Knowledge and Skills	3.24±0.49 2.17-4.33 (3.21)	3.42±0.51 2.25-5 (3.38)	0.048*
Learning and Education	4.09±0.38 3.15-5 (4.15)	4.01±0.38 2.85-4.69 (4.08)	0.240
Confidence			
Diagnosis	2.23±0.93 0-4 (2)	2.92±0.84 1-4 (3)	0.001**
Radiography	2.4±0.89 0-4 (2)	2.86±0.95 0-4 (3)	0.001**
Treatment Planning	2.17±1.06 0-4 (2)	2.88±0.89 1-4 (3)	0.001**
Pain Control	2.27±0.98 0-4 (2)	2.93±0.97 0-4 (3)	0.001**
Managing Dental Emergencies	1.4±1.03 0-4 (1)	2.46±1.13 0-4 (3)	0.001**
Prescription of Antibiotics	1.46±1.17 0-4 (1)	2.06±1.31 0-4 (2)	0.001**
Management/Understanding of Occlusion	1.67±1.06 0-4 (2)	2.8±1.14 0-4 (3)	0.001**
Preventive Dentistry	2.85±0.9 1-4 (3)	3.42±0.77 1-4 (4)	0.001**
Periodontics	2.36±0.86 0.5-4 (2.5)	2.76±1.05 0-4 (3)	0.001**
Removable Prosthodontics	1.44±0.98 0-4 (1.25)	2.22±1.15 0-4 (2)	0.001**
Oral Surgery	1.7±0.98 0-4 (1.75)	2.38±1.11 0-4 (2.5)	0.001**
Patient Management	2±0.82 0-3.86 (2.07)	2.81±0.98 0-4 (3)	0.001**
Restorative Dentistry	2.56±0.85 0.33-4 (2.58)	3.23±0.78 0.83-4 (3.5)	0.001**
Endodontics	2.3±1.03 0-4 (2.5)	2.98±0.92 0.67-4 (3)	0.001**
Indirect Restorations	1.22±0.95 0-4 (1.33)	2.12±1.22 0-4 (2)	0.001**
Bridgework	1.13±0.94 0-4 (1)	2.17±1.22 0-4 (2)	0.001**
Anxiety			
State Anxiety	52.88±13.23 27-80 (52.5)	42.73±11.99 20-80 (42)	0.001**
Trait Anxiety	51.58±10.32 36-77 (49.5)	42.29±9.88 22-67 (42)	0.001**

SD: Standard Deviation. # Mann Whitney-U test ; *p< 0.05, **p<0.01.

Table 1 demonstrates the total preparedness, confidence, and anxiety levels of students in this transition peri-

od. While students showed the highest levels of preparedness in terms of patient contact, the lowest scores were recorded regarding knowledge and skills acquisition. In terms of self-confidence, the highest scores were recorded in preventive dentistry and the lowest in indirect restorations.

Table 3: Opinion, Confidence and Anxiety Levels of Students According to Making an Observation

	Make an Observation (n=96)	Not make an observation (n=86)	p [#]
	Mean±SD Min-Max (Median)	Mean±SD Min-Max (Median)	
Opinions about preparation for clinical practice			
Transition and Professional Socialisation	3.4±0.36 2.33-4.5 (3.42)	3.4±0.31 2.5-4 (3.42)	0.642
Workload	3.61±0.8 1.33-5 (3.67)	3.48±0.69 1.83-5 (3.33)	0.139
Patient Contact	3.59±0.47 2.33-5 (3.5)	3.72±0.47 2.5-5 (3.83)	0.033*
Knowledge and Skills	3.36±0.51 2.25-5 (3.33)	3.39±0.53 2.17-4.67 (3.33)	0.864
Learning and Education	4.04±0.39 2.85-5 (4.15)	4.03±0.37 2.85-4.69 (4.08)	0.770
Confidence			
Diagnosis	2.57±0.99 0-4 (3)	2.92±0.79 1-4 (3)	0.024*
Radiography	2.65±0.97 0-4 (3)	2.84±0.93 0-4 (3)	0.181
Treatment Planning	2.51±1.05 0-4 (3)	2.9±0.88 1-4 (3)	0.014*
Pain Control	2.61±1.03 0-4 (3)	2.92±0.97 0-4 (3)	0.038*
Managing Dental Emergencies	1.97±1.2 0-4 (2)	2.42±1.15 0-4 (2)	0.013*
Prescription of Antibiotics	1.77±1.24 0-4 (2)	2.05±1.36 0-4 (2)	0.167
Management/Understanding of Occlusion	2.21±1.22 0-4 (2)	2.83±1.14 0-4 (3)	0.001**
Preventive Dentistry	3.13±0.89 1-4 (3)	3.43±0.76 1-4 (4)	0.015*
Periodontics	2.56±0.99 0-4 (2.5)	2.77±1.04 0-4 (3)	0.108
Removable Prosthodontics	1.88±1.14 0-4 (2)	2.16±1.16 0-4 (2)	0.071
Oral Surgery	2.12±1.08 0-4 (2)	2.29±1.16 0-4 (2.5)	0.266
Patient Management	2.37±1.06 0-4 (2.43)	2.84±0.89 0.71-4 (3)	0.002**
Restorative Dentistry	2.89±0.88 0.67-4 (2.92)	3.23±0.79 0.33-4 (3.42)	0.007**
Endodontics	2.63±0.99 0-4 (2.67)	2.98±0.97 0.33-4 (3)	0.017*
Indirect Restorations	1.7±1.2 0-4 (1.67)	2.09±1.21 0-4 (2)	0.029*
Bridgework	1.71±1.19 0-4 (2)	2.1±1.27 0-4 (2)	0.026*
Anxiety			
State Anxiety	46.99±12.78 22-80 (47)	43.64±13.27 20-80 (43.5)	0.147
Trait Anxiety	46.9±11.23 22-77 (46)	42.34±9.77 23-63 (42)	0.017*

SD: Standard Deviation. # Mann Whitney-U test; *p<0.05, **p<0.01.

There was no difference between males and females in any of the 5 categories of their preparation for clinical practice (p>0.05). Males had statistically significantly higher lev-

els of confidence than females in diagnosis (p=0.017), radiography (p=0.009), oral surgery (p=0.022), restorative dentistry (p=0.018), endodontics (p=0.001), and indirect restorations (p=0.029). State and trait anxiety levels were found to be statistically significantly higher in females than in males (p=0.013 and p=0.031, respectively).

Dental students from private universities had significantly higher levels of confidence in all areas than those from state universities (p<0.05). They also had statistically higher levels of preparedness in the area of knowledge application and skills (p=0.048). However, workload expectation was significantly higher in state university students (p=0.001). In addition, state university students had significantly higher levels of state and trait anxiety (p=0.001) (Table 2).

Dental students who made observations before had significantly lower preparedness in patient contact (p=0.033) and had lower self-confidence in diagnosis (p=0.024), treatment planning (p=0.014), pain control (p=0.038), managing dental emergencies (p=0.013), management/understanding occlusion (p=0.001), preventive dentistry (p=0.015), patient management (p=0.002), restorative dentistry procedures (p=0.007), endodontic procedures (p=0.017), indirect restorations (p=0.029), and bridgework (p=0.026) than the students who did not make observations. The trait anxiety level of the students who had previously performed observations was statistically significantly higher than those who had not (p=0.017) (Table 3).

The STAI-S and STAI-T were positively and significantly correlated with workload (r=0.447, p=0.000; r=0.450, p<0.001, respectively) and negatively and significantly correlated with knowledge, knowledge application and skills (r=-0.463, p<0.001; r=-0.358, p<0.001, respectively), among the 5 categories that included students' views on their preparation for clinical practice. On the other hand, the STAI-S and STAI-T were significantly negatively correlated with all categories examining students' confidence levels (p<0.05). A more detailed breakdown of these correlations is presented in Table 4.

Discussion

The transition from the preclinical to the clinical phase is a pivotal point in the educational journey of dental students. However, this crucial transition is not without its challenges. The primary objective of this study was to provide a comprehensive examination of dental students' perspectives, self-confidence levels, and anxiety levels during the initial phase of their undergraduate clinical training, and to compare these parameters according to sex, observational status, and university. There have been previous studies investigating the self-confidence and anxiety of students during the transition period between preclinical and clinical training, as well as their perceptions of the gap between these stages (4, 10, 15). Our study is the first to comprehensively assess these variables collectively and to analyze their variations in relation to students' sex, university, and prior clinical observation.

In the context of dental education in Türkiye, it is common for most dental faculties to begin clinical training during the fourth year of the curriculum. In order to effectively capture students' experiences during this transitional period, our study focus-

Table 4: Correlations of evaluated parameters

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1. Age	r	1																							
2. Transition and Professional Socialisation	r	-0.092	1																						
3. Workload	r	-0.09	0.066	1																					
4. Patient Contact	r	0.052	0.274**	0.129	1																				
5. Knowledge and Skills	r	-0.074	0.365**	-0.212**	0.138	1																			
6. Learning and Education	r	0	0.338**	0.04	0.344**	0.450**	1																		
7. Diagnosis	r	-0.056	0	-0.300**	0.008	0.544**	0.183*	1																	
8. Radiography	r	-0.051	0.1	-0.310**	0.073	0.523**	0.197**	0.664**	1																
9. Treatment Planning	r	-0.065	0.025	-0.315**	0	0.605**	0.210**	0.707**	0.599**	1															
10. Pain Control	r	0.093	0.108	-0.279**	0.024	0.492**	0.184*	0.540**	0.452**	0.572**	1														
11. Managing Dental Emergencies	r	0.132	0.039	-0.271**	-0.048	0.459**	0	0.473**	0.461**	0.519**	0.692**	1													
12. Prescription of Antibiotics	r	0.05	-0.055	-0.246**	0.019	0.274**	0.006	0.318**	0.370**	0.368**	0.431**	0.435**	1												
13. Management/ Understanding of Occlusion	r	0.04	0.051	-0.335**	0.056	0.480**	0.172*	0.554**	0.533**	0.594**	0.595**	0.658**	0.537**	1											
14. Preventive Dentistry	r	-0.029	0.149*	-0.189*	0.011	0.488**	0.255**	0.510**	0.517**	0.534**	0.580**	0.558**	0.316*	0.556**	1										
15. Periodontics	r	0.021	0.160*	-0.194**	0.09	0.567**	0.237**	0.537**	0.501**	0.583**	0.512**	0.574**	0.355**	0.551**	0.546**	1									
16. Removable Prosthodontics	r	-0.026	0.066	-0.332**	-0.067	0.443**	0.103	0.449**	0.467**	0.465**	0.517**	0.549**	0.536**	0.592**	0.378**	0.545**	1								
17. Oral Surgery	r	0.083	0.083	-0.247**	0.043	0.430**	0.123	0.481**	0.435**	0.450**	0.557**	0.527**	0.568**	0.532**	0.402**	0.584**	0.552**	1							
18. Patient Management	r	-0.025	0.134	-0.329**	-0.063	0.500**	0.157*	0.566**	0.486**	0.573**	0.567**	0.637**	0.392**	0.639**	0.528**	0.607**	0.576**	0.602**	1						
19. Restorative Dentistry	r	-0.011	0.091	-0.356**	-0.024	0.553**	0.214**	0.569**	0.555**	0.660**	0.608**	0.610**	0.436**	0.658**	0.538**	0.565**	0.579**	0.604**	0.744**	1					
20. Endodontics	r	0.062	-1.47*	-0.293**	0.044	0.485**	0.180*	0.494**	0.513**	0.549**	0.622**	0.615**	0.432**	0.606**	0.538**	0.561**	0.598**	0.628**	0.663**	0.739**	1				
21. Indirect restorations	r	0.062	0.047	-0.349**	-0.002	0.466**	0.097	0.528**	0.524**	0.532**	0.564**	0.602**	0.606**	0.665**	0.414**	0.566**	0.738**	0.682**	0.657**	0.655**	0.657**	1			
22. Bridgework	r	0.028	0.001	-0.340**	-0.051	0.436**	0.053	0.528**	0.569**	0.535**	0.499**	0.577**	0.558**	0.626**	0.412**	0.537**	0.720**	0.648**	0.643**	0.676**	0.628**	0.834**	1		
23. State Anxiety	r	-0.112	-0.121	0.447**	-0.015	-0.463**	-0.144	-0.388**	-0.407**	-0.376**	-0.356**	-0.372**	-0.179*	-0.364**	-0.319**	-0.306**	-0.355**	-0.198**	-0.404**	-0.420**	-0.327**	-0.354**	-0.288**	0.761**	1
24. Trait Anxiety	r	-0.061	-0.124	0.450**	0.066	-0.358**	-0.026	-0.344**	-0.383**	-0.376**	-0.354**	-0.389**	-0.148*	-0.408**	-0.339**	-0.349**	-0.401**	-0.219**	-0.434**	-0.470**	-0.353**	-0.324**	-0.281**	0.761**	1

r: Correlation coefficient. Spearman's Rank Correlation Test; *p<0.05, **p<0.001.

es on a cohort of dental students in Türkiye who have completed their third year of school. There is currently no official comprehensive data source on the exact number of dental students enrolled in all institutions in Türkiye. Although the Higher Education Program Atlas (YOK Atlas) provides an estimate of the number of students enrolled in dental faculties at a specific point in time, its accuracy in capturing the entire student population may be limited. Variables such as students' academic underperformance, withdrawal from school, or engagement in English preparatory programs could affect the actual number of students present in dental faculties during the period under study. The findings of the study might not be fully representative of the entire population or may lack generalizability beyond the sample studied. Therefore, these factors should be considered when interpreting the results and drawing conclusions from the study.

The overall results showed that the students agreed that they had the necessary knowledge and training, would have a heavy workload, and would have no trouble making professional contacts in preparation for clinical practice. However, it was noted that students from state universities perceived a higher demand in terms of workload. In Türkiye, due to financial constraints, state universities admit a higher volume of patients compared to private universities, which may account for these observed differences. As Prince et al. (4) suggested, comprehensive orientation at the beginning of the clerkship, coupled with a gradual adjustment of workload expectations can be an effective approach to improving this phase is to provide. The highest levels of preparedness were observed in the area of patient contact. In line with these findings, Prince et al. (4) also observed that the majority of dental students transitioning to clinical practice did not experience significant challenges with patient contact.

Dental schools are considered challenging learning environments, and research has shown that dental students tend to experience higher levels of stress than the general population (16-18). In particular, clinical training can significantly affect the performance of dental students by exposing them to a variety of stressors associated with patient care (19). Alexander and Haldane (20) emphasized that the transition from preclinical to clinical education is a stressful period. This study showed that, according to medical students, this increased stress is closely related to the transition from a dependent learner to an independent decision-maker. This stress may be exacerbated by significant changes in the learning environment and teaching styles. Radcliffe and Lester (21) have shown that students may experience feelings of inadequacy due to a perceived lack of clinical knowledge and skills, ultimately leading to escalated stress levels. The STAI is a commonly used assessment tool designed to measure anxiety, which is an expression of an individual's response to stress (22). In this study, it was observed that female students exhibited elevated levels of both state and trait anxiety compared to their male counterparts. Similar to our findings, Halboub et al. (23) also found higher levels of general anxiety in female dental students compared to males, and they attributed these findings to differences in gender-specific coping mechanisms employed in response to stressful circumstances.

Dental practices are detailed procedures that require meticulous attention and extensive knowledge. Conducting pre-observation can reduce anxiety by facilitating familiarity with the

clinical environment in advance. Paradoxically, however, the sight of the rigorous and disciplined work environment associated with dental procedures can also evoke disturbing feelings. This phenomenon may explain the higher trait anxiety scores observed in our study among students who had previously made an observation. However, while the difference in state anxiety scores for students who had previously observed did not reach statistical significance, the trend toward higher anxiety levels in this group was evident. This may be due to feelings of inadequacy, which can serve as a powerful catalyst for increased anxiety levels. Mishra (24) found that several significant sources of academic anxiety among dental students, including increased workload, time constraints, lower academic grades, fear of academic failure, and intense competition; notably, these stressors were equally prevalent among both state and private college students, with no statistically significant differences noted between the two groups. Our findings suggest that state faculties had students with higher levels of state and trait anxiety. This finding can be attributed to the highly competitive and demanding nature of education within state universities in Türkiye, largely due to their larger student populations. Consequently, this difference also elucidates why students attending private institutions tended to score higher on self-confidence than their counterparts in state universities. Furthermore, while private universities may offer more individualized and intense interactions between students and instructors, state universities may employ a more standardized teaching approach, which could potentially influence students' self-confidence. On the other hand, our findings suggest that making observations and being a female student may have a diminishing effect on confidence. Indeed, according to one study, female students were more confident in performing preventive resin restorations, giving oral hygiene instructions, and placing rubber dams than male students, who were more confident in performing surgical extractions, making duplicate dentures, preparing veneers, and handling orthodontic emergencies (25). Another study concurs with the current study's assessment of sex differences in confidence levels. Comparatively, male students reported more self-confidence than female students (26). In addition, another Turkish study found that male students in the Department of Oral Surgery tended to be more confident than their female counterparts (27). The reason for this general lack of self-confidence in female students may be due to their tendency to be perfectionists in their chosen profession.

At first sight, it seems unexpected that students who had previously performed clinical observations were found to be more insecure. The quality and frequency of students' observation experiences, as well as the range and diversity of practices they were able to observe, may have influenced this outcome. On the other hand, it is possible that these students were more aware of the complexities and demands of clinical practice. In this instance, increased awareness enables students to recognize their actual lack of qualifications. Students continue their theoretical education simultaneously during the transition period to clinical practice, therefore it is not an expected result that they have high self-confidence in the clinical skills. Consistent with this assumption, the total median confidence level scores in each major skill area did not exceed 3 in the present study. When examining the total confidence scores, the highest values were observed in preventive dentistry. Despite

the focus on senior students, Aldegheshem et al. (25) observed, in line with our study, that the highest level of confidence was noted in preventive dental practices, including pit and fissure sealants, preventive resin restorations, and oral hygiene instructions among students.

Dentistry is a discipline that encompasses both art and science and is involved in the processes of diagnosis, prognosis, and treatment planning. Proficiency in this field requires a combination of sound clinical skills, a comprehensive theoretical knowledge base, and practical expertise. Given the multifaceted nature of dentistry, clinicians must continually cultivate their competencies in a variety of ways. Prior to clinical training, an observation raises awareness of this, which can be intimidating for students and lower self-confidence. Such a phenomenon may provide a plausible explanation for the results observed in our study.

The current study's correlation analyses revealed a relationship between students' perceptions of their workload, knowledge, and skills, as well as their degree of confidence, and their anxiety. According to Wang et al. (28), anxiety disorder is strongly correlated with workload. Therefore, it is expected to detect a positive correlation between workload and STAI-S and STAI-T levels in our investigation. On the other hand, lack of knowledge may lead to anxiety. Students' worries that they might be unable to complete clinic duties effectively can cause them to become extremely anxious. This condition is comparable to the finding that self-confidence lowers anxiety in clinical applications. Therefore, it is not surprising that anxiety in our study had a negative correlation with self-confidence.

It is important to note that other factors, such as psychiatric disorders and medication use, may also impact the levels of stress and anxiety measured by the STAI. The present study did not assess these factors, which constitutes a notable limitation. Future research should focus on investigating the influence of psychiatric illnesses and other possible confounding variables on stress and anxiety levels to provide a more comprehensive understanding of these phenomena.

Another limitation of the current study may be that it involved only a limited number of students from Türkiye. Future research including participants from multiple countries with a larger number of students is needed to obtain comparable results. The inclusion of open-ended questions in future research is recommended to improve our understanding of students' expectations.

Conclusion

Professional confidence has a direct impact on the quality of clinical practice, which in turn influences patient interaction, willingness to undertake more challenging treatments, job satisfaction, and ultimately career advancement. Confidence and anxiety are opinionated parameters. Feelings of preparedness, anxiety, and confidence for clinical education experienced by students can be influenced by factors such as sex, academic institution, and observation status. As a result, evaluations and orientation programs considering the effects of these factors can help students in this transition period. Given that insufficient knowledge or lack of experience is frequently the primary cause of anxiety, it is essential to educate students on clinical skills. Engaging in exercises that simulate real patient scenarios can serve as an effective method

for increasing students' self-confidence in preparation for clinical practice. Moreover, acknowledging students' accomplishments and providing positive feedback can enhance their self-confidence, consequently reducing their anxiety levels.

Declarations

Author Contributions: Conception/Design of Study- B.Y.E., B.K.; Data Acquisition- O.Y.; Data Analysis/Interpretation- B.Y.E.; Drafting Manuscript- B.Y.E., A.E.S., B.K.; Critical Revision of Manuscript- B.Y.E., A.E.S.; Final Approval and Accountability- A.E.S., B.K.; Material and Technical Support- B.Y.E.; Supervision- B.K.

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