The Relationship Between Bruxism and Anxiety and Personality Traits in Pre-Clinical Dental Students

Klinik Öncesi Diş Hekimliği Fakültesi Öğrencilerinde Bruksizm ile Anksiyete ve Kişilik Özellikleri Arasındaki İlişki

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Abstracts
Objectives: The aim of this investigation was to assess anxiety levels, personality types and the presence of bruxism in preclinical dental students and to analyse the possible relationships between these factors.
Materials and Methods: Volunteer participants were given detailed information and then explanations were made to help them understand the research questions. The A and B Personality Inventory, the Beck Anxiety Test and the Self-Reported Bruxism Questionnaire were administered to the participants. This process was carried out face-to-face and the participants were allowed to answer the questions in a comfortable environment without writing their names. Descriptive statistics and Pearson chi-square test were used. The probability level for statistical significance was set as $\alpha = 0.05$.
Results: The A and B Personality Inventory, the Beck Anxiety Test and the Self-Reported Bruxism Questionnaire were administered to the participants. 30% of students are Type A and 70% are Type B. Sleep and awake bruxism was statistically more prevalent in female participants ($p=0.017$; $p=0.012$). There was no statistically significant relationship between sleep and awake bruxism and anxiety and personality types ($p>0.05$).
Conclusions: Overall, this study of pre-clinical dental students reveals that the student population has varying levels of anxious and type B personality traits. However, in this group of students, no significant relationship was found between sleep and awake bruxism and personality type and anxiety levels.
Keywords: Dentistry, preclinical, anxiety, personality, bruxism

Özet
Amaç: Bu araştırmanın amacı, klinik öncesi diş hekimliği öğrencilerinin anksiyete düzeylerini, kişilik tiplerini ve bruksizm varlığını değerlendirmek ve bu faktörler arasındaki olası ilişkileri analiz etmektir.
Gereç ve Yöntemler: Gönüllü katılımcılara detaylı bilgi verilmiş ve ardından araştırma sorularını anlamaları için açıklamalar yapılmıştır. Katılımcılara A ve B kişilik envanteri, Beck Anksiyete Testi ve Self Reported Bruksizm Anketi uygulanmıştır. Bu süreç yüz yüze gerçekleştirilmiş olup, katılımcıların rahat bir ortamda isimlerini yazmadan soruları yanıtlamaları sağlanmıştır. Tanımlayıcı istatistikler ve Pearson kikare testi kullanıldı. İstatistiksel anlamlılık için olasılık düzeyi $\alpha = 0.05$ olarak belirlendi.
Bulgular: Beck Anksiyete testine göre öğrencilerin 19'u (%25) anksiyete seviyesinin ciddi, 27 si (%36) anksiyete seviyesinin orta şiddette ve 19'u (%25) uyku ve uyanıklık bruksizmi olduğu belirlendi. Öğrencilerin %30'u A Tipi ve %70'i B Tipidir. Uyku ve uyanıklık bruksizmi kadın katılımcılarda istatistiksel olarak daha yaygındı ($p=0.017$; $p=0.012$). Uyku ve uyanıklık bruksizm ile anksiyete ve kişilik tipleri arasında istatistiksel olarak anlamlı bir ilişki saptanmadı ($p>0.05$).
Sonuçlar: Bu klinik öncesi diş hekimliği öğrencileri üzerinde yürütülen araştırma genel olarak, öğrenci popülasyonunun çeşitli düzeylerde anksiyetik ve B tipi kişilik özelliklerine sahip olduğunu ortaya koymaktadır. Ancak, bu öğrenci grubu içinde, uyku ve uyanıklık bruksizmi ile kişilik tipleri arasında ve anksiyete düzeyleri ile arasında belirgin bir ilişki tespit edilememiştir.
Anahtar Kelimeler: Diş hekimliği, preklinik, anksiyete, kişilik, bruksizm

Introduction

Dental students have to successfully complete many theoretical and practical courses during their education, as it is a profession that plays an active role in human health. Dental education includes theoretical and practical courses of specialisation consisting of 8 departments (1). The attention and stress required by the dental profession is also reflected in the students undergoing dental training (2). After high school education, students develop relationships with peers from different regions in university life. Interpersonal relationships and evaluation of academic performance at university can cause stress (3). At the same time, personality is one of the factors that determine an individual's level of stress and ability to cope with stress (4).

Abnormal activity caused by strong jaw movements characterised by teeth grinding or clenching is called bruxism (5). Bruxism is a stereotyped movement disorder, such as teeth grinding or clenching, that occurs in 8-21% of people (6). Bruxism can occur as sleep bruxism, which occurs at night during sleep, and diurnal bruxism, which occurs during the day while awake (7). Bruxism is associated with many complications, including hypertrophy of the jaw muscles, tooth wear, fracture and deterioration of restorations or implants, tenderness and pain in the teeth, muscles or joints temporomandibular joint disc displacement, severe myofascial pain, muscle contractions and headaches (8).

In addition to pathophysiological factors such as smoking, disease, trauma and genetics, alcohol, caffeine, illicit drugs and drug abuse may play a role in the aetiology of bruxism (9). Electrical activity in the masticatory muscle has been shown to increase when psychological stress is increased under experimental conditions. An increase in bruxism has also been observed after stressful and tiring days. Studies of psychological factors in bruxism have found strong associations with anxiety and Type A behaviour (10).

The Beck Anxiety Inventory is considered the gold standard in anxiety measurement because of its brevity, simplicity and purported ability to measure general anxiety (11). Personality needs to be measured in order to make decisions about people for a variety of purposes. The methods used to measure personality can be categorised under three headings: Observational methods, personality inventories and projective techniques. A personality inventory is like a standardised interview where everyone is asked the same questions and the answers can be easily scored (12).

Literature exists on bruxism and anxiety in dental students (13-16). However, it is noted that bruxism and personality analysis have not been focused on in dental students. The aim of this study was to evaluate the relationship between bruxism and anxiety levels and personality traits of students in pre-clinical classes at the Faculty of Dentistry.

The null hypotheses of the study;

1: There is no statistically significant difference between anxiety levels of pre-clinical dentistry students and bruxism.

2: There is no statistically significant difference between personality traits of pre-clinical dentistry students and bruxism.

Materials and methods

Our study was conducted out with the participation of volunteer students studying in the 1st and 2nd year at the Faculty of Dentistry of Nigde Omer Halisdemir University in the 2023-2024 academic year.

Participants were informed about the study and research questions, personality inventory, Beck Anxiety Test and self-reported bruxism questionnaire were administered face-to-face. Participants were asked not to write their names when completing the questionnaire form. Ethical approval was obtained from Nigde Omer

Halisdemir University Non-Interventional Clinical Research Ethics Committee (Ethics Committee No: 2023/103).

The sample size was calculated using the Raosoft Web Survey Software program (http://www.raosoft.com/samplesize.html). It was calculated that 162 participants were needed in the population (According to 2020 TDB data, Turkey's 2023 dental faculty quota), with a confidence interval of 80% and an alpha error of 5% (17).

The A&B Personality Inventory was adapted into Turkish by Aktaş and Arıkan in 1988. This inventory is a scale with seven polar opposite statements. In addition to having a structure similar to the Likert scale, the use of polar opposites is similar to the Semantic Differences scale.

The inventory is scored by adding up the participant's responses to the items. The total score is multiplied by 3 and those with a score below 100 are classified as having a Type B personality and those with a score above 100 are classified as having a Type A personality. In this way, the total score that each participant receives from the personality scale varies between 21 and 168.1 (Table-1).

The Beck Anxiety Scale (19) is an internationally validated psychological test designed to measure a person's level of anxiety. The participant is asked to rate each question on a scale of 0 to 3, thinking about the extent to which each situation has affected them in the past week, including the present.

The BECK-A Scale is a 21-question inventory, and when the scores are added together, a total score is obtained that reflects the person's level of anxiety. Scores range from 0 to 63, representing different levels of anxiety. The classification according to the Beck Anxiety Scale is as follows 0-9 points: Mild anxiety, 10-18 points: Moderate anxiety level, 19-63 points: Severe anxiety level.

Table 1. Type A&B Personality Inventory (17)

I am not meticulous about the use of time	1	2	3	4	5	6	7	8	I'm extremely time-sensitive.
I am not competitive at work.	1	2	3	4	5	6	7	8	I am very competitive in business life.
Even under pressure, I never feel in a hurry.	1	2	3	4	5	6	7	8	I always feel like I'm in a hurry
After thinking everything through, I make a decision.	1	2	3	4	5	6	7	8	I try to do many things at once. Then I think about what to do next.
I do something slowly.	1	2	3	4	5	6	7	8	I can do something quickly.
I express my emotions.	1	2	3	4	5	6	7	8	I hide my emotions.
I am interested in many subjects.	1	2	3	4	5	6	7	8	Other than business, I have very few interests

According to the 2018 consensus, patients with positive self-reported (SR) bruxism were considered to have possible bruxism (20). The self-reported bruxism questionnaire 21 included five questions with two answers: 1. Do you grind your teeth during sleep? 2. Has anyone ever told you that you grind your teeth when you sleep? 3. Is your jaw tense when you awake up in the morning or at night? Yes answers to these questions indicate the presence of sleep-related bruxism. Yes answers to questions 4 and 5 indicate that the participant has waking self-reported bruxism.

Statistical analysis

The data obtained were analysed using the Statistical Package for Social Sciences version 23.0 (SPSS Inc., Chicago, Ill., USA). Descriptive statistics and the Pearson chi-square test were used. Data

were analysed as mean (±) standard deviation, frequency distribution as percentage. The probability level for statistical significance was set at α = 0.05.

Results

A total of 76 students participated in the study, 42 females and 34 males (Table 2). The mean age was 19.44±1.3 years.

According to the Beck Anxiety Scale, 19 (25%) of the students had severe anxiety, 27 (36%) had moderate anxiety and 21 (28%) had low anxiety (Figure 1).

Table 2. Gender

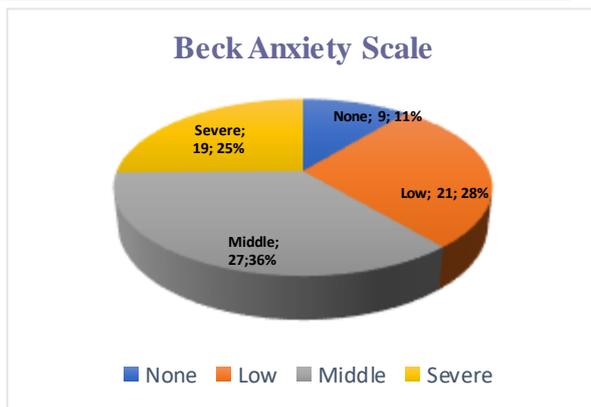| Gender	n	%
Female	42	55.2
Male	34	44.7
Total	76	100

Figure 1. The level of anxiety of the participants according to the Beck Anxiety Scale

According to the self-reported bruxism questionnaire, bruxism during sleep and awake was observed in 19 (25%) of the students (Figure 2,3).

Figure 2. Proportion of participants with sleep bruxism and participants without sleep bruxism

Figure 3. Proportion of participants with sleep bruxism and participants without Awake Bruxism

In our study, we observed that sleep and awake bruxism was statistically more pronounced in female participants (p=0.017; p=0.012).

The study found no statistically significant relationship between sleep and awake

awake bruxism and anxiety levels measured by the Beck Anxiety Scale. (0.05>p).

In addition, 30% of students exhibit Type A personality traits and 70% exhibit Type B personality traits (Figure 4).
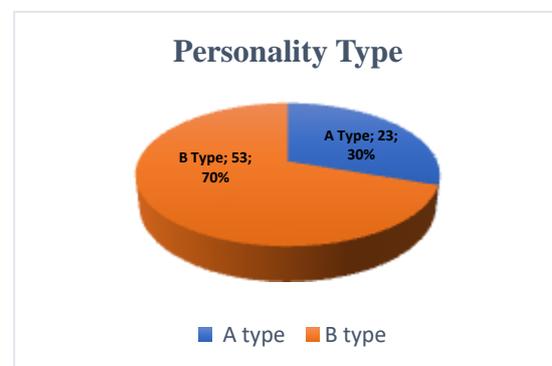

Figure 4. Personality type distribution of the participants

In our study, no statistically significant relationship was found between sleep and awake bruxism and personality types (p>0,05) (Table 3,4).

Table 3. The relationship between Sleep&Awake Bruxism and Beck Anxiety Scale (Pearson's χ2 tests)

Sleep Bruxism	Beck Anxiety Scale				p-value
	None	Low	Middle	Severe	
None	0	8	5	6	
Available	9	13	22	13	.113
Awake Bruxism	Beck Anxiety Scale				p-value
	None	Low	Middle	Severe	
None	14	14	16	10	
Available	7	7	11	9	.586
* Significant p<0.05					

Table 4. Personality type in Sleep and Awake Bruxism (Pearson's χ2 tests)

Sleep Bruxism	Personality Type		p-value
	A type	B type	
None	17	40	
Available	6	13	.885
Awake Bruxism	Personality Type		p-value
	A type	B type	
None	13	34	
Available	10	19	.529
* Significant p<0.05			

Discussion

According to the results of our study, 25% of the students undergoing preclinical training in our faculty had severe anxiety and 36% had moderate anxiety according to the results of the Beck Anxiety Test. In the literature, from studies conducted in different countries around the world, there are various findings on anxiety, burn out and depression rates in both preclinical and clinical dental students. According to a study conducted at a dental school in Turkey, 52.46% of preclinical students found the practical training stressful (22). Another study found that students experienced high levels of stress during their first clinical placement in restorative dentistry (23). Anxiety and stress were reported by 66.8% and 54.7% of dental students in Saudi Arabia and 44% and 11% in Australia, respectively (24,25).

An Indian study reported mild or moderate anxiety and depression in all years of dental students (26). Dörter et al. reported that stressors for dental students included lack of adequate rest, limited vacation days, exams, busy daily schedules, long clinical hours, inadequate working hours, competition, and success anxiety (2).

Research shows that anxiety and depression have been assessed using different methods and with heterogeneous sample groups. Therefore, despite variation in the frequency of anxiety and depression, it is reasonable to conclude that the majority of dental students experience mild to moderate levels of stress and anxiety. According to the results of our study, 25% of the students had sleep and awake bruxism and this condition was more common in females (p=0.017; p=0.012). In another study conducted in Turkey, the prevalence of bruxism was found to be 40%. The same study reported that both bruxism and psychological symptom scores were statistically higher in women (14). The frequency of awake and sleep bruxism in Thai dental students was found to be 35.78% and 37.28% respectively (27). In Brazilian dental students, the prevalence of bruxism was found to be 33.6% and was reported to be positively associated with female gender and depression. The higher incidence of bruxism in women may be related to the fact that women are more easily stressed (13).

These results show that dental students from different geographical areas have almost similar bruxism tendencies. However, no statistically significant relationship was found with anxiety levels. On the other hand, a systemic review reported that there was no difference between sleep and awake bruxism and gender, which contradicts the results of our study (28). This study also reported a

positive association between bruxism and anxiety and depression scores (29). However, in our study we did not find a statistical relationship between bruxism and anxiety. We should consider that this may be due to the small sample size.

The concepts of Type A and Type B personalities were first defined by cardiologists Meyer Friedman and Rosenman (18,30). People with Type A personalities are generally aggressive, impatient, competitive, fast-moving, weak in relationships and selfish (18,30). Type B personality describes individuals who are generally patient, non-competitive, mild-mannered, dislike bragging and do not feel time pressure (18,30).

Our study revealed that the majority of our students had Type B personality traits. There are a limited number of studies that have assessed the personality types of dental students and dentists worldwide, and these studies have used different assessment methods.

Rodriguez and colleagues found that the majority of fourth-year dental students had judgmental and sensitive personality types, using a different personality test than the one used in this study. It was found that sensitive personality types generally tend to be lower sensory extroverts, cautious and organised, whereas judgmental personality types tend to be cautious about schedules, prepare calendars, agendas, timetables, lists, drafts, and are neat and organised (31).

Wolf and colleagues analysed the personality characteristics of German dentists and found that they were less stubborn, conscientious, optimistic, ambitious and introverted. These characteristics were suggested to have positive qualities in the dentist-patient relationship (32).

Wu and his team found that dental students often have three personality types. The first type is down-to-earth and sociable, interested in concrete, practical learning and not interested in useless things. The second type is serious, calm and perfectionistic. The third type is usually quiet and calm. This is supported by the study by Ihm and colleagues (33,34).

In addition, it has been reported in the literature that dental students with extroverted and sensitive personality traits contribute positively to postgraduate educational processes (35). On the other hand, according to the guidelines of the American Dental Education Association, the qualities required of a successful dentist include effective communication, use of clear language, reliability, ability to focus on details, artistic approach, leadership, passion for the profession, empathy and willingness to provide care (36).

The personality assessment method used in this study has not been used in studies of dental students in the existing literature. According to the results obtained, the fact that the majority of students have Type B personality traits, i.e. they are patient, mild mannered, avoid boasting, are open to criticism, are more satisfied with their work and can express their anger with humour (18,30,37) may be an advantage when practising dentistry.

In addition, there was no statistically significant association between sleep and wake bruxism and personality type. However, in the general population, bruxism is often associated with perfectionism, increased anger and aggression, which are often cited in the literature (38,39).

However, the results of this study do not fit this general trend. The main limitation of the study is that it was conducted in a single centre, which limited the sample size. In addition, bruxism was only assessed using questionnaires and scales, and clinical assessment was not used. In the future, there is a need for multicentre studies with larger samples, including clinical assessment for the diagnosis of bruxism.

Conclusion

This study of pre-clinical dental students generally shows that the student population has varying levels of anxiety and Type B personality traits. However, no significant relationship was found between sleep and awake bruxism and personality types and anxiety levels in this group of students.

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Conflicts of Interest statement

The authors have no conflict of interest.

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