Original Article / Araştırma Makalesi

COMPARISON OF DENTAL ANXIETY AND FEAR AMONG VOCATIONAL SCHOOL STUDENTS AND EVALUATION OF THE RELATIONSHIP BETWEEN ORAL HEALTH HABITS AND THE TYPE OF EDUCATION

Meslek Yüksekokulu Öğrencilerinde Dental Anksiyete ve Korkunun Karşılaştırılması ve Ağız Sağlığı Alışkanlıkları ile Eğitim Türü Arasındaki İlişkinin Değerlendirilmesi

Kübra DEĞİRMENCİ[1] ⓘ   *Elif Ülkü DEMİR ŞERAN[2]* ⓘ
Nagehan ÖZTOPUZ ATALA[3] ⓘ   *Ömer ZENCİRLİ[4]* ⓘ
[1]*Bolu Abant İzzet Baysal University, Faculty of Dentistry, Bolu*
[2,3]*Kırıkkale University, Faculty of Dentistry, Kırıkkale*
[4]*Devrekani Public Hospital, Kastamonu*

ABSTRACT

This cross-sectional study evaluated the dental anxiety and fear (DFA) levels, and also the influence of basic medical health knowledge on oral health attitudes in the students of the medical and paramedical vocational schools. 291 students were included the study. Modified Dental Anxiety Scale's (MDAS) and Dental Fear Scale's (DFS) questions were used to define degree of anxiety and fear. The students' answers were evaluated considering the assigned cut points for MDAS (no fear: 5-11, low fear: 12-18, high fear: 19-25), for DFS (pointslow: 0-40, moderate: 41-60, high: 61-80, extreme high: 81+). Mann-Whitney U Tests were used to compare two school groups. Chi-square test was used to analyze categorical variables (α:0.05). Gender and the school program have been determined to have an important impact on DFA levels of the students (p<0.05). The scores of students in the vocational medical school were significantly lower than the scores of the paramedical vocational school students (p<0.05). The index scores for female students were significantly higher than the scores defined for male students (p<0.05). The type of school program influenced dental anxiety. The study points out that being familiar with health terms may be effective to manage DFA.

Keywords: Dental anxiety, Dentistry, Education program, Fear, Modified dental anxiety scale.

ÖZ

Bu kesitsel çalışma, sağlık ve paramedikal meslek yüksekokulları öğrencilerinin dental anksiyete ve korku (DFA) düzeylerini ve ayrıca temel sağlık bilgisinin ağız sağlığı tutumları üzerindeki etkisini değerlendirmiştir. 291 öğrenci çalışmaya dâhil edildi. Anksiyete ve korkunun derecesini tanımlamak için Modifiye Dental Anksiyete Skalası (MDAS) ve Dental Korku Skalası (DFS) soruları kullanıldı. Öğrencilerin cevapları, MDAS için belirlenen aralıklar (korku yok: 5-11, düşük korku: 12-18, yüksek korku: 19-25) ve DFS için belirlenen aralıklar (düşük puan: 0-40, orta: 41-60, yüksek: 61-80, çok yüksek: 81+) dikkate alınarak değerlendirildi. İki okul grubunun skorlarını karşılaştırmak için Mann-Whitney U Testleri kullanıldı. Kategorik değişkenler Ki-kare testi ile değerlendirildi (α: 0.05). Cinsiyet ve okul türünün DFA düzeyleri üzerinde önemli etkiye sahip olduğu tespit edildi (p<0.05). Sağlık meslek okulundaki öğrencilerin puanları, paramedikal meslek okulundaki öğrencilerin puanlarından anlamlı derecede daha düşüktü (p<0.05). Kız öğrencilerin indeks puanları, erkek öğrenciler için tanımlanan puanlardan anlamlı düzeyde yüksekti (p<0.05). Okul programının türü dental anksiyeteyi etkiledi. Çalışma, sağlık terimlerine aşina olmanın DFA'yı yönetmede etkili olabildiğine dikkat çekmektedir.

Anahtar kelimeler: Dental anksiyete, Diş hekimliği, Eğitim programı, Korku, Modifiye dental anksiyete skalası.

Kübra DEĞİRMENCİ ✉, *dtkubradegirmenci@outlook.com*
Bolu Abant İzzet Baysal University, Faculty of Dentistry, Bolu

INTRODUCTION

Anxiety is described as a sense of worry about an event with an uncertain outcome. Dental anxiety means individuals' specific reaction to stress related with dental procedures due to lack of knowledge (Jaakkola et al., 2009). Dental anxiety and fear can jeopardize oral health management. Anxious patients are generally prone to delay dental treatments. Neglecting dental care for a long time could require more complicated invasive dental treatments due to teeth deficiency, increased number of decayed teeth, and severe periodontal diseases (Deep, Singh, Sharma, Singh, & Mattoo, 2020). Delayed dental treatments can become complex and require multi-stage procedures. Therefore, dental fear of anxious individuals can be triggered (Kim & An, 2019). An intense dental fear cycle occurs when anxiety is not appropriately managed. This correlation was named as the vicious cycle (Silveira et al., 2020). Expectedly, dental anxiety and fear can enhance the vicious cycle (Armfield, 2013). Managing dental anxiety and fear is important to break this cycle and for this, anxious patients' oral health profile can be improved (Heidari, Andiappan, Banerjee, & Newton, 2017).

A specific stimulus, such as injections or sounds of dental instruments, can trigger lack of control feeling, fear of pain, and dental anxiety. Differently, fear is defined as a personal reaction to threatening events or a hazardous situation (Perusini & Fanselow, 2015). Clinically, dental anxiety and dental fear are considered as similar feelings. Because, both emotional responses can be expressed by patients in the same way. This interchangeably usage has been described as an umbrella term' dental anxiety and fear' (DFA) in a novel review (Beaton, Freeman, & Humphris, 2014).

DFA has great importance around the world because of its' prevalence and impact on the quality of life. According to the previous study, almost one in six adults has high dental fear in western countries (McGrath & Bedi, 2004). In Turkey, it was stated that the dental fears were common with a prevalence of 21.3% when considering the general population (Firat, Tunc, & Sar, 2006). The former studies have searched the effect of various factors on DFA (Cohen, Fiske, & Newton, 2000; Jaakkola et al., 2009; Kheir et al., 2019). Because management of DFA can be efficient to develop oral health profile and quality of life (Alamri, Alshammari, Baseer, Assery, & Ingle, 2019).

A variety of scales have been introduced to compare effects of various factors on DFA. Of these, Modified Dental Anxiety Scale (MDAS) and Dental Fear Scale (DFS) have been mostly preferred in the studies (Firat et al., 2006; Alamri et al., 2019; Kaczmarek, Debska, Debska, & Grezbieluch, 2010). Because, MDAS and DFS are translated into different

languages and the scales were reliable instruments to facilitate the evaluation of anxiety levels of study population.

Various factors such as anxiety disorders, personality features, traumatic experiences, indirect empathic experiences, cognitive ability, gender, age, culture and even education can contribute person's DFA (Beaton et al., 2014). Education can alter individual's perception and oral health attitudes. Dental students learn treatment procedures and they can handle anxiety and fear feelings (Klingberg & Broberg, 2007). The frequency of being introduced to terms related with health sciences and medical procedures may change degree of DFA. As reported in a former study, low education level can be a reason of increased DFA (Drachev, Brenn, & Trovik, 2018, McGrath & Bedi, 2004). As a solution, dentist's explanation about dental treatments can diminish anxiety of patient by serving as an educational communication (Kheir et al., 2019).

Anxiety and education are related each other. It is important to search the effect of different education type on DFA. Thus, effective strategies can be improved to handle DFA and enhance oral health status of anxious patients. Previous studies have searched anxiety levels of students in different age ranges (Alamri et al., 2019; Kaczmarek et al., 2010; Drachev et al., 2018), but the effect of vocational education on DFA has not been investigated. Considering the effect of vocational education during learning age, oral health perceptions of students can be changed. The object of the study was to investigate the effect of vocational education type on oral health habits and DFA of the vocational school students. Oral health habits and DFA levels of the students in vocational medical school and vocational paramedical school students were comparatively evaluated in the study.

MATERIAL AND METHOD

The study was approved by the Ethics Committee of the University (28.03.2019 /No: 48). Volunteer participants were included in the study. In this cross-sectional study, 291 students from vocational medical or paramedical school were participated. The students were informed about the study and their written consents were received. Students who had previously participated in another anxiety study, and non-volunteer students were not included in the study.

The questionnaire of the study included three sections. The first part of the form contained questions related with personal oral health attitudes (whether or not he/she has been to a dentist before, how often he/she goes to dentist, which operation was reason of dentist visit, habit of smoking and tooth-brushing habit). The Turkish version of MDAS was the second part of the form. The scale was developed by Humphris and his team (Humphris, Freeman, Campbell,

Tuutti, & D'Souza, 2000). Validation of the scale was conducted by Tunç and her team (Tunc, Firat, Onur, & Sar, 2005).

The answer to each question of the MDAS consists of five answers (5-point likert scale) that vary from 'not worried' to 'be more uneasy'. The maximum score to be obtained from each question can be 5, so the minimum and maximum scores of the whole scale can range in from 5 to 25. The dental anxiety level of the students with MDAS score of 19 and above was evaluated as high anxiety; 11-18 was evaluated as moderate anxiety and below 11 was evaluated as low dental anxiety. DFS was the third part of the form. The scale consists of 20 items. Each question of the scale was scored according to the marked option; a: 1, b: 2, c: 3, d: 4, e: 5. Considering the scores; over 80 points were evaluated as extremely high anxiety, 60-80 points as high anxiety, 40-60 points as moderate anxiety, and below 40 points as low anxiety.

Sample Size Calculation

To determine the moderately standardized differences in MDAS scores (effect size ≥0.3), the study sample size was estimated using data distribution values from the reference population at α: .05 significance level with 80% power and two-sided t tests (Gunjal, Pateel, & Parkar, 2017). Considering to this information, minimum required total sample size was calculated as 232 subjects.

Statistical Analysis

Obtained data were checked for normal distribution with Kolmogorov Smirnov test (p<.001). Mann-Whitney U test was used for pairwise comparison and Pearson correlation was used to define the correlation between two scales. Partial correlation was done to control the effects of gender and school program factors on the index scores. Chi-square test was used to compare the answers of self-assessed questions related oral health habits with the scores of the indexes.

RESULTS

The study population were the students in the vocational medical (n:142) school and the paramedical vocational school (n:149). 160 female and 131 male students were sampled from two different schools. The age of the participant students ranges from 19 to 25 years showing mean age of 20.33±2.03. MDAS and DFS were used to obtain DFA scores from the study population. Cronbach's alpha coefficient values were found as 0.86 for MDAS and 0.96 for DFS with well internal reliability. In the study, Pearson correlation coefficient was defined as

r:0.789 (p<0.001) for the relation between the scales indexes. Therefore, a positive significant correlation between the scales was defined.

All participants answered MDAS, DFS and self-assessed oral health questions. The MDAS and DFS scores were defined as 11.25±4.03 and 37.54±15.14 for study population in respectively. According to MDAS scores, low anxiety was reported as 57% , moderate anxiety was defined as 37.5% and high anxiety was reported as 5.5% for the participants. The mean and standard deviations of MDAS and DFS scores were shown in Table 1. The median, minimum and maximum values of MDAS and DFS scores for the students were described in Table 2 with Mann-Whitney test comparison in respectively. The MDAS and DFS scores of paramedical students were notably higher than medical students' scores (p<0.05). Also, index scores of female students were relevantly higher than male students' scores (p<0.05). Comparing the effect of school program through same gender groups, higher anxiety scores of both indexes were obtained for paramedical students than medical students (p<0.05). Gender and school program significantly affected the anxiety scores according to partial correlation results (r:0.784 p<0.001 for gender and. r:0.773 p<0.001 for school program).

Table 1. MDAS and DFS Scores According to Gender and School Programs

Gender	Medical School Program			Paramedical School Program		
	Female	Male	Total	Female	Male	Total
MDAS Score	10.96±3.19	9.60±3.38	10.42±3.32	12.99±4.88	11.09±3.80	12.05±4.47
DFS Score	34.66±11.87	32.18±12.40	33.66±12.10	43.12±18.12	39.34±15.16	41.24±16.77
Data are presented as mean± SD for the scores according to gender and school programs.						

Table 2. Comparison of the Scores for Gender and School Programs

		Medical School Program	Paramedical School Program
MDAS Score	Female	11(6-19)[aA]	12(6-25)[bA]
	Male	9(5-19)[aB]	11(6-23)[bB]
	Total	10(5-19)[x]	12(6-25)[y]
DFS Score	Female	34(19-75)[aA]	42(19-91)[bA]
	Male	30(19-73)[aB]	36(19-88)[bB]
	Total	32(19-75)[x]	38(19-91)[y]

Data are presented as median (minimum-maximum) and compared by Mann-Whitney U test. In each column, small letters (a and b) define the horizontal significant differences and capital letters (A and B) define the vertical significant differences (p<0.05). X and Y letters define the significant differences in total scores of school programs (p<0.05).

The results of self-assessed questions were evaluated with the scales' scores. According to chi-square test results, there was no significant difference between the scores and the answers of the self-assesed questions (p>0.05) (Table 3 and Table 4).

Table 3. Comparison of Mean Anxiety Scores of MDAS and Self-assesed Questions Related to Oral Health Habits

Level Of Anxiety (MDAS)	How Frequently Do You Visit A Dentist?					p value
	Never n (%)	Occasionally n (%)	When There Is A Complaint n (%)	Once A Year n (%)	Once A Six Months n (%)	
Low (5-11)	18(10.8)	17(10.2)	102(61.4)	5(3.0)	24(14.5)	0.65
Moderate (12-18)	12(11.0)	18(16.5)	66(60.6)	8(7.3)	5(4.6)	
High (19-25)	0(0)	3(18.8)	11(68.8)	1(6.3)	1(6.3)	

Level Of Anxiety (MDAS)	What Was The Reason For Your Last Visit To A Dentist?						p value
	Examination/ Control n (%)	Periodontics n (%)	Surgical Procedures n (%)	Orthodontics n (%)	Restorative Procedures n (%)	Pain n (%)	
Low (5-11)	44(26.5)	7(4.2)	6(3.6)	9(5.4)	13(7.8)	87(52.4)	0.62
Moderate (12-18)	21(19.3)	6(5.5)	4(3.7)	3(2.8)	7(6.4)	68(62.4)	
High (19-25)	2(12.5)	1(6.3)	1(6.3)	1(6.3)	0(0)	11(68.8)	

Level Of Anxiety (MDAS)	How Often Do You Brush Your Teeth?				p value
	Once A Day	2 to 3 Times A Day	More Than 3 Times A Day	Once A Week	
Low (5-11)	53(31.9)	99(59.6)	8(4.8)	6(3.6)	0.59
Moderate (12-18)	40(36.7)	60(55.0)	4(3.7)	5(4.6)	
High (19-25)	4(25.0)	9(56.2)	2(12.5)	1(6.3)	

Data are shown as mean ±SD and compared by Fisher Exact Chi Square test.*p<0.05, statistically significant.

Table 4. Comparison of Mean Anxiety Scores of DFS and Self-assesed Questions Related to Oral Health Habits

Level Of Anxiety (DFS)	How Frequently Do You Visit A Dentist?					p value
	Never n (%)	Occasionally n (%)	When There Is A Complaint n (%)	Once A Year n (%)	Once A Six Months n (%)	
Low (0-40)	20(11.0)	18(9.9)	114(62.6)	6(3.3)	24(13.2)	0.121
Moderate (41-60)	9(10.2)	14(15.9)	54(61.4)	7(8.0)	4(4.5)	
High (61-80)	0(0)	5(29.4)	10(88.8)	1(5.9)	1(5.9)	
Extreme high (81+)	1(25.0)	1(25.0)	1(25.0)	0(0)	1(25.0)	

Level Of Anxiety (DFS)	What Was The Reason For Your Last Visit To A Dentist?						p value
	Examination/Control n (%)	Periodontics n (%)	Surgical Procedures n (%)	Orthodontics n (%)	Restorative Procedures n (%)	Pain n (%)	
Low (0-40)	46(25.3)	10(5.5)	8(4.4)	9(4.9)	15(8.2)	94(51.6)	0.356

Moderate (41-60)	17(19.3)	2(2.3)	2(2.3)	4(4.5)	5(5.7)	58(65.9)
High (61-80)	3(17.6)	2(11.8)	0(0)	0(0)	0(0)	12(70.6)
Extreme high (81+)	1(25.0)	0(0)	1(25.0)	0(0)	0(0)	2(50)

Level Of Anxiety (DFS)	**How Often Do You Brush Your Teeth?**				**p value**
	Once A Day	2 to 3 Times A Day	More Than 3 Times A Day	Once A Week	
Low (0-40)	56(30.8)	110(60.4)	9(4.9)	7(3.8)	
Moderate (41-60)	34(38.6)	45(51.1)	4(4.5)	5(5.7)	0.541
High (61-80)	6(35.3)	11(64.7)	0(0)	0(0)	
Extreme high (81+)	1(25.0)	2(50.0)	1(25.0)	0(0)	

Data are shown as mean ±SD and compared by Chi Square test (Monte Carlo Simulation).*p<0.05, statistically significant.

However, smoking habit and dental clinic visit attitudes significantly changed according to the school program (p<0.05) (Table 5). Smoking habit of the paramedical students was significantly higher than the medical students' smoking habit (p<0.05). Also, frequency of visit to a dentist was defined as higher for paramedical students than medical students (p<0.05). Considering the reasons of the visits, pain was defined as the most frequent reason for both school students. There were no significant differences between both school student groups for teeth brushing habits (p>0.05) (Table 5).

Table 5. Comparison of Self-assesed Questions Related to Oral Health Habits and School Program

School Program	**SmokingHabit**			**p value**
	Never Smoking n (%)	Smoking n (%)	Quit Smoking n (%)	
Medical	76(53.5)	53(37,3)	13(9.2)	**0.041**
Paramedical	59(43.7)	77(51.7)	13(8.7)	

School Program	**How Frequently Do You Visit A Dentist?**					**p value**
	Never n (%)	Occasionally n (%)	When There Is A Complaint n (%)	Once A Year n (%)	Once A Six Months n (%)	
Medical	19(13.4)	20(14.1)	90(63.4)	3(2.1)	10(7.0)	**0.041**
Paramedical	11(7.4)	18(12.1)	89(59.7)	11(7.4)	20(13.4)	

School Program	**What Was The Reason For Your Last Visit To A Dentist?**						**p value**
	Examination/ Control n (%)	Periodontics n (%)	Surgical Procedures n (%)	Orthodontics n (%)	Restorative Procedures n (%)	Pain n (%)	
Medical	40(28.2)	7(4.9)	6(4.2)	9(6.3)	18(12.7)	62(43.7)	**<0.01**
Paramedical	27(18.1)	7(4.7)	5(3.4)	4(2.7)	2(1.3)	104(69.8)	

School Program	**How Often Do You Brush Your Teeth?**	**p value**

	Once A Day	2 to 3 Times A Day	More Than 3 Times A Day	Once A Week	
Medical	38(26.8)	93(65.5)	5(3.5)	6(4.2)	0.590
Paramedical	59(39.6)	75(50.3)	9(6.0)	6(4.0)	
Data are shown as mean ±SD and compared by Chi Square test. *p<0.05, statistically significant.					

DISCUSSION

This study searched the degree of DFA in a sample of young student population from two different vocational schools. According to the results, it was concluded that school type and gender had an impact on DFA. The hypothesis is the type of school program has an impact on the level of DFA of students was accepted.

Although preventive and curative advances continue in dentistry field; DFA has been remained as an important matter. Therefore, the degree of DFA is important to manage oral health profile. The multifaceted nature of DFA was assessed in the researches (Alamri et al., 2019; Beaton et al., 2014; Kaczmarek et al., 2010). Due to the different indexes in the studies, the effect of factors underlying these feelings may not be fully compared (Alamri et al., 2019).

MDAS and DFS have been mostly used in recent studies (Alamri et al., 2019; Firat et al., 2006; Kaczmarek et al., 2010). The Cronbach alpha coefficients of MDAS and DFS in the study were 0.86 and 0.96 respectively. These results were in line with a former study (Mărginean & Filimon, 2012) whose Cronbach alpha coefficients were 0.90 and 0.95. Further, reliability and validity of the Turkish version of both scales have been proved (Firat et al., 2006; Tunc et al., 2005).

DFA can be evaluated for interactions of multiple factors such as age, gender and level of the education (Erten, Akarslan, & Bodrumlu, 2006; Firat et al., 2006; Mărginean & Filimon, 2012). Previously, the frequency of DFA was reported to be common between the ages of 18 and 26, and it could be related to the physiological effects of being an adult (Locker, Thomson, & Poulton, 2001). In a previous study, high dental anxiety rate was defined as 22.2%, moderate dental anxiety and low or no dental anxiety rates were reported as 29.5%, and 48.3% in respectively for similar young population (Kheir et al., 2019). In this study, high dental anxiety rate was defined as 5.5%, moderate dental anxiety rate was reported as 37.5%, and low dental anxiety rate was reported as 57%. Although similar anxiety distribution rates of the studies, the anxiety scores of the current study is lower than the former study. This difference can be attributed to other confounding factors such as gender, education and culture.

In the study, the effect of gender on the index scores is significant, especially the scores of female participants were defined as higher than male participants' scores. These results are

in accordance with a former study (Blumer, Ram, Costa, & Peretz, 2018). It can be the result of emotional and psychological differences between genders: males are more prone to hide their feelings and females are likely to express their emotionsand fear of pain (Gunjal et al., 2017; Sghaireen, Zwiri, Alzoubi, Qodceih, & Al-Omiri, 2013). However, some studies stated that the effect of gender on the anxiety was not significant (Basudan, Binanzan, & Alhassan, 2017; Peker, Alkurt, Usta, & Turkbay, 2009). At that point, cognition and expression of anxiety by individuals can be confounding factors to alter DFA levels. Dental cognition including negative experiences, cognitive control, and expectations can vary person to person (Gunjal et al., 2017). Besides, some people feel frequently anxious without any external factors due to restless mood.

Anxiety is an emotion against unknown, so having knowledge about the dental procedures and education can decrease DFA. There is an inverse correlation between education level and degree of anxiety. The former studies stated that students received dental education had lower levels of anxiety than students from other faculties not receiving dental education (Carrillo-Diaz, Crego, Armfield, & Romero-Maroto, 2012; Peretz & Efrat, 2000). Also, a former study investigated anxiety among dental students, proved that anxiety index scores were found to be greater for the first-year dental students compared to the other year students (Acharya & Sangam, 2010). Experience and knowledge about different dental treatments during dentistry education be considered as an important factor that provides a decline in DFA. (Al-Omari & Al-Omiri, 2009; Menziletoğlu, Akbulut, Büyükerkmen, & Işık, 2018). In accordance with these findings, medical students' index scores were significantly lower than paramedical school students' scores. Also, it was observed that medical students were more careful about regular dental examinations to maintain oral health. Medical students have recognized the importance of regular dental examination.

Dental procedures must be performed in a way that the patient cannot see, so anxiety feeling can be triggered. Dentist's explanation about the dental treatment would support the management of DFA. Armfield and Ketting stated that strong DFA can be a reason to avoid dental treatment (Armfield & Ketting, 2015). But, there is no relationship between the self-questions related with oral health and the index scores in the current study. It probably may be the result of low number of the participants with high degree DFA. The oral health awareness of participants can be a reason for defined low scores. In a former study conducted in participants with similar population, the rate of students who never visited the dentist was determined as 22.7% (Khalifa, Allen, Abu-bakr, Abdel-Rahman, & Abdelghafar, 2012). Differently, 13.4% of medical students and 7% of paramedical students stated that never visited

the dentist. Therefore, it can be concluded that the oral health attitudes of participants are efficient on DFA.

There are some limitations in the study. First, confounding effect of psychological factors (e.g., depression, obsession) has not been searched in the study. Second, two mostly used indexes, MDAS and DFS, were used to compare the obtained results with previous studies. However, the complex nature of DFA can be investigated with the use of different indexes such as Fear of Dental Pain Questionnaire and Depression Scale for depression in further studies. Third, the study population composed of young students from two different school types. But, age, experience and living in a city with improved health services can change perception of individuals. Therefore, to figure out the dynamics of DFA, further studies are needed in different population.

CONCLUSIONS

According to the results of the study, education can be concluded as an important factor to decrease DFA. Having knowledge about the medical procedures could decrease DFA. The study emphasizes the importance of being familiar to medical terms and procedures.

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