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THE EFFECT OF THE EDUCATION LEVELS OF DENTAL STUDENTS ON THEIR DENTAL ANXIETY
DİŞ HEKİMLİĞİ ÖĞRENCİLERİNİN DENTAL KAYGI DÜZEYLERİNİN DEĞERLENDİRİLMESİ

Mustafa AYATA [1], Ravza ERASLAN[2]

[1] *DDS, Prosthodontist, Private Practice, Kayseri, Turkey*
[2] *DDS, Department of Prosthodontics, Faculty of Dentistry, Erciyes University, Kayseri, Turkey*

ABSTRACT

The purpose of this study was to compare dentalanxiety levels among first-, second-, third-, fourth- and fifth-year dental students. To evaluate the level of dental anxiety against dental interventions, online questionnaires were applied to first year (n=96), second year (n=96), third year (n=109), fourth year (n=107) and fifth year (n=92) dental students. The students' demographic information (age, gender) was also recorded. These questionnaires included the Modified Dental Anxiety Scale (MDAS). The students whose MDAS score was ≥19 were considered as highly anxious. The statistical analysis was performed using IBM SPSS Statistics 24 (IBM SPSS, USA).This study was conducted with a total of 500 students including 220 male and 280 female students. The students with an MDAS score of 19 (having dental anxiety) were 23 people (4.6%) in total. No statistically significant difference was found between the class years of the students in terms of their mean MDAS scores (p: 0.387). When the responses given to the 5 items in MDAS were evaluated, only the responses given to the 1st and 5th questions had statistically significant differences (p<0.01).An inversely proportional situation, such as a decrease in dental anxiety as the class year of students gets more advanced, was not valid for our study. Many previous studies have shown that both education level and dental education may be effective in reducing the level of dental anxiety. However, the results of our study did not support this situation.

Keywords: Dental anxiety scale, dental students, anxiety

ÖZ

Bu çalışmanın amacı, birinci, ikinci, üçüncü, dördüncü ve beşinci sınıf diş hekimliği öğrencilerinin dental kaygı düzeylerini karşılaştırmaktı. Dental girişimlere karşı dental kaygı düzeyini değerlendirmek için birinci (n=96), ikinci (n=96), üçüncü (n=109), dördüncü (n=107) ve beşinci sınıf (n=92) diş hekimliği öğrencilerine çevrimiçi anket uygulandı. Öğrencilerin demografik bilgileri de (yaş, cinsiyet) kaydedildi. Bu anketler Modifiye Dental Anksiyete Skalası'nı (MDAS) içeriyordu. MDAS puanı ≥19 olan öğrenciler yüksek düzeyde kaygılı olarak kabul edildi. İstatistiksel analiz, IBM SPSS Statistics 24 (IBM SPSS, ABD) kullanılarak yapıldı. Bu çalışma 220'si erkek 280'i kız olmak üzere toplam 500 öğrenci ile gerçekleştirildi. MDAS puanı 19 olan (dental kaygısı olan) öğrenciler toplam 23 kişiydi (%4.6). Öğrencilerin MDAS puan ortalamaları açısından sınıf yılları arasında istatistiksel olarak anlamlı bir fark bulunmamıştır (p: 0.387). MDAS'de ki beş soruya verilen yanıtlar değerlendirildiğinde, sadece birinci ve beşinci sorulara verilen yanıtlarda istatistiksel olarak anlamlı farklar vardı (p <0.01). Öğrencilerin sınıf yılı ilerledikçe dental kaygılarının azalması gibi ters orantılı bir durum çalışmamız için geçerli değildi. Daha önce yapılan birçok çalışma, hem eğitim düzeyinin hem de diş hekimliği eğitiminin dental kaygı düzeyini azaltmada etkili olabileceğini göstermiştir. Ancak çalışmamızın sonuçları bu durumu desteklememiştir.

Anahtar kelimeler: Dental kaygı ölçeği, diş hekimliği öğrencileri, kaygı

Corresponding Author: PHD Asst. Prof. Mustafa AYATA, Cumhuriyet mahallesi, Millet Caddesi, Bakkaloğlu İş Merkezi Kat:1 No:105, 38220 Melikgazi/Kayseri/Türkiye, dt.mustafaayata@gmail.com, https://orcid.org/0000-0001-6102-9729
PhD, Assis. Prof. Ravza Eraslan, ravza_asl@hotmail.com

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INTRODUCTION

The human body has developed to cope with various stresses. The human organism shows biochemical and behavioral adaptation (1). Anxiety is considered an expression of the individual's struggle against general stress. The individual responds to mental stress with anxiety (2). Anxiety is one of the very difficult problems to resolve. Anxiety is worry and a form of nervousness towards an unknown danger (3). Dental anxiety is a more specific response of the patient to stress during dental treatment than general anxiety (4). Dental anxiety is a state of intense anxiety that cannot be fully explained and develops due to fear and delusions associated with dental treatment (5). Despite the technological advances made in the field of modern dentistry, concerns about dental treatment continue in society (6).

Traumatic dental experiences, personal characteristics, gender, age and education levels affect the dental anxiety levels of patients (7). It was found that psychological and environmental factors also play a role in development of dental anxiety (8). There are studies examining the relationship between factors such as age, gender and education level and dental anxiety levels (9).

Management of the treatment process by the physician causes many people to think that they do not have control over the events related to them and to feel anxiety. It was reported that not knowing about the intervention to be applied, not knowing what will happen and when it will happen will cause anxiety (5).

In the literature, there are studies showing that anxiety increases as the level of education decreases (10). Apart from the level of education, the field of the education that is received may also affect dental anxiety. For example, it has been determined that students studying dentistry have lower levels of dental anxiety than students studying engineering and medicine (9).

One of the principles of relieving anxiety in pediatric dentistry is the "tell-and-show" method. Thanks to this technique, the reaction of the pediatric patient to the dental environment and various dental treatment practices may be eliminated, and the patient can be desensitized. Considering that their education process is a continuous "tell-and-show" method for students in dentistry education, students should try dental treatments on themselves. The dental anxiety levels of dental students gradually decrease in the later years of their education, and the anxiety of a dental student with dental treatment experience decreases more than that of a student without experience (11).

The view of evaluating dental anxiety pioneered the development of various instruments and psychometric scales that measure dental anxiety (12).Various scales are available to measure dental anxiety (13). We used the Modified Dental Anxiety Scale (MDAS) form in this study (14).

This study aimed to determine the dental anxiety levels of dentistry students and compare the effects of dental education on dental anxiety between different class years. The null hypothesis of this study is that will not decrease in dental anxiety as the class year of students gets more advanced.

MATERIALS AND METHODS

Our study included 1st-year (n = 96), 2nd-year (n = 96), 3rd-year (n = 109), 4th-year (n = 107) and 5th-year (n = 92) students studying at Erciyes University, School of Dentistry (mean age: 21.48 ± 1.81, gender (F / M): 280/220). The total number of the participants was 500.The study started after it was approved by the Erciyes University Non-Interventional Clinical Research Ethics Committee (Decision No: 2021/171 Date: 03.03.2021). As the education process was ongoing in the form of an online system within the scope of the COVID-19 pandemic measures, it was planned to apply the surveys online. After the students were given information about the study, the students who agreed to participate in the study by approving the informed voluntary consent form filled the questionnaire forms online. The questionnaire form consisted of the MDAS, Figure I, which is frequently used to measure dental anxiety with demographic information (14).

MDAS is a five-item, five-point Likert-type scale with the response to each item ranging from 'not nervous' to 'overly anxious'. In the evaluation of MDAS, the sum of the scores obtained from each question is taken into account (14). Therefore, the maximum score that can be obtained from the scale is 25 (high anxiety), while the minimum possible score is 5 (no anxiety). The dental

1. If you went to your dentist for treatment tomorrow, how would you feel?
   (1) Not anxious
   (2) Slightly anxious
   (3) Fairly anxious
   (4) Very anxious
   (5) Extremely anxious
2. If you were sitting in the waiting room (waiting for treatment), how would you feel?
   (Same alternatives as Q.1)
3. If you were about to have a tooth drilled, how would you feel?
   (Same alternatives as Q.1)
4. If you were about to have your teeth scaled and polished, how would you feel?
   (Same alternatives as Q.1)
5. If you were about to have a local anaesthetic injection in your gum, above an upper back tooth, how would you feel?
   (Same alternatives as Q.1)

Figure I. Modified Dental Anxiety Scale

anxiety levels of the students whose MDAS score was ≥19 were evaluated as high (having dental anxiety) (12). The students in this study were advised to respond to the items sincerely.

The statistical analysis of the data obtained from the responses to the questionnaire forms was carried out using the SPSS (Ver. 24.0, IBM Corp., Armonk, USA) program. Shapiro-Wilk Normality test was used to evaluate whether the scores were normally distributed. It was determined that all data were non-normally distributed, and Kruskal-Wallis test was used for comparison between the class years of the participants, whereas Mann -Whitney U test was used for the pairwise comparisons between the class years. The results are presented as mean, standard deviation, median, minimum and maximum values. The level of statistical significance was accepted as p <0.05.

RESULTS

Of the 500 students participating in the study, 280 are female and 220 are male, and their mean age was 21.48 ± 1.81 (Table I). There was no significant difference in terms of gender between the groups allocated based on the students' class years. The mean age of the students in their fifth year of study was found to be significantly higher (p<0.05) (Table I).

The mean scores of the 1st-5th year students in each item of the scale and their mean total scale scores are presented in Table II. The highest anxiety level was found in relation to the thought of performing dental anesthesia among the first-year students (2.34 ± 1.16). The highest anxiety level was related to the thought of going to the dentist among the second-year (2.51 ± 0.88), third-year (2.73 ± 1.14), fourth-year (2.77 ± 1.08) and fifth-year (2.67 ± 0.96) students. The fourth-year students had higher scores in the first item of MDAS. The scores of the third-year students were higher in the second, fourth and fifth items (p<0.05). In the third item, the scores of the third- and fifth-year students were higher than the students in the other years of study (p<0.05). However, a significant difference was found between the groups only in terms of their scores in the first and fifth items (p<0.05) (Table II). When the MDAS scores of the first item were evaluated, it was determined that the scores of the first-year students were significantly lower than the scores of the other years students (p<0.05). When the MDAS scores of the fifth item were evaluated, it was determined that the scores of the third-year students were significantly higher than the scores of the other years students (p<0.05) While the mean MDAS score of the first-year students was 10.29 ± 3.80, it was 10.54 ± 3.31 in the second-year, 11.56 ± 4.42 in the third-year, 10.90 ± 4.24 in the fourth-year and 10.93 ± 4.04 in the fifth-year students. There was no statistically significant difference between the class years according to their mean total MDAS scores (p> 0.001) (Table II). The number of students with an MDAS score of ≥19 was found to be 1 (1.04%) among the first-year students and 5 (5.43%) among the fifth-year students.

DISCUSSION AND CONCLUSION

In this study, we evaluated the dental anxiety levels of dentistry students and compare the effects of dental education on dental anxiety between different class years. Our study did not reach the conclusion that there was an inverse proportion between education level and dental anxiety. Therefore, the null hypothesis was accepted.

A high level of anxiety about dental procedures affects the oral health of patients negatively, and the patients cannot benefit from the treatments provided by the dentist. Thus, negative effects arising from dental anxiety occur in their quality of life. There are many studies

Table I. The demographic information and MDAS ≥ 19 ratios of the students

	1.Class (n=96)	2. Class (n=96)	3. Class (n=109)	4. Class (n=107)	5. Class (n=92)	Total (n=500)	Test Statistic	P Values
Gender (W/M)	49/47	51/45	57/52	63/44	60/32	280/220	5.911	0.206*
Age	19.48±1.23[a]	20.56±1.18[b]	21.42±0.90[c]	22.45±1.07[d]	23.48±1.52[e]	21.48±1.81	326.888	P<0,001**
MDAS≥19	1 (%1.04)	3 (%3.12)	6 (%5.50)	4 (%3.74)	5 (%5.43)	23 (%4.60)	1.827	0.076***

Result of * Pearson Chi-Square test, ** Kruskal-Wallis H test and *** Fisher's Exact test. W: Women, M: Men. n: Number of subjects. Note: Pairwise comparison of classes in age parameter was made with Dunn-Bonferroni test. The difference in inline superscript letters indicates the difference between groups.

Table II. The comparison of the mean MDAS scores of the students according to their class years

	1.Class (n=96)		2.Class (n=96)		3.Class (n=109)		4.Class (n=107)		5.Class (n=92)		Total (n=500)		Test Statistic	*p* value*
	Mean± SD	Med (%25-%75)	Mean± SD	Med (%25-%75)	Mean± SD	Med (%25-%75)	Mean± SD	Med (%25-%75)	Mean± SD	Med (%25-%75)	Mean± SD	Med (%25-%75)		
Q1	2.30± 1.14[a]	2.00 (1-3)	2.51± 0.88[b]	3.00 (1-3)	2.73± 1.14[b]	3.00 (1-3)	2.77± 1.08[b]	3.00 (1-2)	2.67± 0.96[b]	3.00 (1-3)	2.60± 1.06	3.00 (2-3)	16.228	***0.003***
Q2	1.91± 0.94	2.00 (2-3)	1.89± 0.90	2.00 (1-2)	2.09± 1.00	2.00 (1-3)	2.02± 0.96	2.00 (1-2)	2.03± 1.07	2.00 (1-3)	1.99± 0.98	2.00 (1-3)	2.948	0.567
Q3	1.90± 0.93	2.00 (2-4)	2.05± 0.99	2.00 (1-3)	2.13± 1.11	2.00 (1-3)	1.93± 0.92	2.00 (1-3)	2.13± 1.04	2.00 (2-3)	2.03± 1.00	2.00 (1-3)	4.825	0.306
Q4	1.84± 0.92	2.00 (2-4)	1.74± 0.74	2.00 (1-3)	1.97± 1.04	2.00 (1-2)	1.83± 0.98	2.00 (1-2)	1.91± 0.93	2.00 (1-3)	1.86± 0.93	2.00 (1-2)	7.429	0.534
Q5	2.34± 1.16[a]	3.00 (2-3)	2.35± 1.13[a]	2.00 (1-3)	2.63± 1.06[b]	3.00 (1-3)	2.35± 1.21[a]	2.00 (1-3)	2.18± 1.12[a]	2.00 (1-3)	2.38± 1.14	2.00 (1-3)	11.951	***0.0018***
Total	10.29± 3.80	10.00 (7-13)	10.54± 3.31	10.00 (8-13)	11.56± 4.42	11.00 (8-14.5)	10.90± 4.24	11.00 (7-14)	10.93± 4.04	10.00 (8-14)	10.86± 4.01	10.00 (8-13)	5.470	0.242

* P values according to Kruskal Wallis test results. SD: Standard deviation, Med: Median. Pairwise comparison of classes in Q1 and Q5 parameter was made with Dunnonferroni test. The difference in inline superscript letters indicates the difference between groups.

investigating detection of dental anxiety and its effects on quality of life (15). The scales preferred in determining the level of dental anxiety include the Corah Dental Anxiety Scale (CDAS) and the MDAS (16). Although CDAS is a scale consisting of four questions, which can be easily understood by patients and are easy to apply in this direction, it does not contain a question about local dental anesthesia injection. MDAS, which we preferred in our study, is a modified dental anxiety detection scale consisting of five questions obtained by adding a question to determine the level of anxiety related to intraoral injection to CDAS (15). Humphris et al. (15) reported that dental injection was the most worrisome situation for people. Since concerns for local anesthesia are common among patients, we preferred to use MDAS in our study to determine the participants' statuses regarding this particular topic in relation to anxiety.

Students who receive dental education in the first, second and third years of dentistry schools do not have detailed knowledge about dentistry and its practices, apart from traditional dentistry knowledge, since they will take dental clinical practice courses more intensely in their fourth and fifth years of study. Fourth- and fifth-year dentistry students, on the other hand, gain very detailed knowledge of dentistry and its practices by taking theoretical / practical training in the field of dentistry over the years and starting to care for patients in the clinic. There are many studies that have demonstrated that education level is related to dental anxiety (9, 10). By including first-, second-, third-, fourth- and fifth-year students in our study, we wanted to determine whether anxiety about dental procedures varies as the level of the knowledge students on this topic increases.

İlgüy et al. (13) investigated the validity and reliability of MDAS in the Turkish society, where they categorized patients with a score of 19 as having dental anxiety and stated that the scale had appropriate sensitivity and specificity. In the same study, they reported the rate of patients with high dental anxiety levels as 8.8%. It was stated that 7.3% of adult individuals in France have high dental anxiety levels, and this anxiety increases as the education level of individuals decreases in rural areas (10). In Canada, 5.5% of the population have been reported to have a high level of dental anxiety (17). Humphris et al. (15) found the rate of those who had high level of anxiety about dental procedures as 11.6% in their study conducted on adult individuals in 2009. In their research conducted with 880 university students in Finland in 2012, Halonen et al. (18) reported the rate of students with dental anxiety as 11.3%. In another study conducted on students, Kaakko et al. (19) stated that high dental anxiety levels are detected in 19% of students studying at universities in the USA. In a study in which the dental anxiety levels of dentistry students and students of medical and engineering schools were investigated, it was found that the dental anxiety levels of dental students were lower in comparison to the others (9). In the study by Tellez et al. (20) in 2015 investigating the prevalence of dental anxiety in patients, it was reported that MDAS scores ranged from 5 to 24 (mean 13.3). The majority of patients (50.8%) were classified as having low dental anxiety (MDAS 5-12), while 26.7% were classified as having moderate dental anxiety (MDAS 13-18), and 22.5% were classified as having high dental anxiety (MDAS 19-24). In our study, the rate of the students studying at the school of dentistry who had high dental anxiety levels was determined as 4.6%.

It has been reported in the literature that the incidence of dental anxiety ranges from 4% to 20%. There are articles reporting that the anxiety levels of women are higher than those of men, as well as articles indicating that there is no difference between genders (21). In their study in 2019 investigating dental anxiety among postgraduate pediatric dentistry students (PGS) and their instructors, Blumer et al. (22) reported that the dental anxiety levels of PGS and their instructors were similar. It was also stated that female PGS and instructors had higher dental anxiety levels than males. In our study, we could not find any difference between the men and women in terms of their dental anxiety levels.

Arslan et al. (23) reported in their dental anxiety and oral health study conducted on first-,second- and third-year dentistry students that anxiety felt towards dental procedures decreased as the class year of these students increased. In another study evaluating the dental anxiety level of first- and last-year dentistry students, it was reported that 10.4% of the first-year students and 1.8% of the fourth-year students had an MDAS score of ≥ 19, meaning they had high levels of dental anxiety (24). It was also stated in their study that the mean total MDAS scores in the first- and last-year students were 12.52 and 10.16, respectively, and the difference between the groups was significant. Chowdhury et al. (25), in the study where they investigated dental anxiety in freshman and senior dental students in 2019, reported that the level of dental anxiety among freshman dental students was higher than that of senior students. As a possible reason for this, it was thought that senior students were more accustomed to their clinical environments and scenarios. As opposed to the case in the aforementioned studies, in our study, the mean scores indicating the level of dental anxiety were 10.29 ± 3.80 in the first-year and 10.93 ± 4.04 in the fifth-year students. There was no statistically significant difference between the class years in terms of their mean total MDAS scores ($p = 0.387$).

The proportion of the students with high anxiety levels based on an MDAS score of ≥ 19 was 1.04% among the first-year students and 5.43% among the fifth-year students. Contrary to the results of previous studies, our study did not reach the conclusion that there was an inverse proportion between education level and dental anxiety. When the responses given to the items in MDAS were compared and evaluated based on the class years of the students, only the responses given to the 1st ($p = 0.011$) and 5th (0.031) items were found to be significantly different between the class years. The responses given to the 2nd, 3rd and 4th items were not significantly different.

In this study, which was conducted to evaluate the dental anxiety levels of students studying at the school of dentistry, no statistically significant decrease was found in the anxiety levels of the students as their number of years of education increased. However, the literature review revealed that most studies have reached the conclusion that dental anxiety levels of students will

decrease with an increase in the number of years of education, an increase in the clinical training they receive and their formation of professional experience. The main reason why such a result was not seen in our study may have been that the students answered this questionnaire online during the COVID-19 pandemic period that affected the whole world. During this period, students could not come to the school actively, theoretical courses were held online, clinical practice training, which should normally be carried out face-to-face, was suspended and could not be accessed.

The fact that the 4th- and 5th-year students could not receive the clinical training they would receive in a normal period significantly reduced their experience and increased their anxiety levels. This situation may be considered as a limitation of this study. In the near future, when the pandemic loses its momentum, and the normal flow of education returns, the same questionnaire may be applied again among these students, and the results of the two implementations of the questionnaire may be compared. This is among the future plans of our research team.

CONFLICT OF INTEREST

The authors declare no conflict of intererest.

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