

The effect of vocational awareness level on dental anxiety and oral health among the students of dentistry

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Original Article

Abstract

BACKGROUND AND AIM: The purpose of this study was assessing oral health status and dental anxiety differences between the freshman and senior dental students and the effect of awareness on dental practices.

METHODS: Freshman (n = 71) and senior dental students (n = 41) were included in this study. All participants were applied Corah Dental Anxiety Scale (C-DAS) and asked for the frequency of dental visits in a year. Gingival index (GI), plaque index (PI), bleeding on probing (BOP), probing depth (PD), clinical attachment level (CAL), and decayed, missing, and filled teeth (DMFT) index were recorded. Number Cruncher Statistical System (NCSS) program and Shapiro-Wilk, t, Mann-Whitney U, Pearson chi-square, and Fisher-Freeman-Halton tests were used for statistical analysis (P < 0.0500).

RESULTS: C-DAS score of the freshman students was found significantly higher than the senior students (P < 0.0500). There was a statistically significant difference in the frequency of dental visits between freshman and senior students (P < 0.0010). GI, PI, and BOP values of the freshman students were significantly higher than the senior students (P < 0.0010). There was no statistical differences between PD and CAL measurements (P > 0.0500). It was found that the DMFT index of freshman students was significantly higher than the senior students (P < 0.0010).

CONCLUSION: This study has shown that dental anxiety decreases as awareness and consciousness increase in terms of dental practice. More anxious participants' oral health is weak, individuals with high dental anxiety make fewer visits to the dentists and need more dental practices.

KEYWORDS: Dental Anxiety; Oral Health; Awareness

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Although dental fear and dental anxiety are two of the most pressing issues for dentists, they do not mean the same thing. Generally, the feeling of unknown tension that emerges with the thought that something bad is about to happen is called anxiety, while the response to a danger with a known cause is called fear. Dental fear often begins with a traumatic dental procedure during childhood (85%), and the attitude of the dentist is of great importance when this fear begins. The most feared practices among dental

practitioners are the use of aerators and micromotors, local anesthetic administration, and tooth extraction.¹

The best methods for determining the dental anxiety caused by these fears are to use questionnaires and scales to assess questions that the individual has answered, and these methods have been used in many studies.^{2,3} These measures include the Dental Anxiety Scale (DAS), Modified DAS (MDAS), Dental Anxiety Questionnaire, and Photo Anxiety Questionnaire.⁴ Studies using these scales have shown that certain demographic

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characteristics, such as low educational level and low socioeconomic status, as well as age and gender have decisive influences on dental anxiety.² In addition, fear of dental treatment procedures can affect individuals compliance and cause the deterioration of their oral health status.^{2,3}

Periodontal disease and tooth decay are the most common oral diseases. These diseases are often the result of poor oral hygiene and poor compliance with dental treatment.⁵ Periodontal disease is an important cause of tooth loss in adults.⁶ It is not usually noticed during the early stages of the disease,⁷ but it becomes more noticeable as the disease progresses by showing signs of swelling and bleeding in the gingiva, and consequently, tooth mobility due to the loss of the structures that support the tooth.^{8,9} Tooth decay is another common oral disease and it is a lifelong threat. Previous studies conducted in developed countries have shown a decline in the caries prevalence, and this decline is the result of various factors, including oral hygiene education.¹⁰

Individuals with dental anxiety may develop periodontal disease or caries due to their non-compliance with routine dental practices; and thus, necessary treatments cannot be performed. Therefore, the purpose of this study was to assess the oral health status and dental anxiety differences between the students who are in the first year in dental school (freshman) with a low level of knowledge about dental practices and the students who are in the last year, i.e., 5th year in dental school (senior) who have learned dental practices in detail. In addition, the effect of the awareness of dental practices was compared among these variables.

Methods

Study population

This study's protocol was approved by the Ethics Committee of Van Yuzuncu Yil University, Van, Turkey (B.30.2.YYU.0.01.00.00/36-23/03/2018) and it was conducted in the Department of

Periodontology, School of Dentistry, Van Yuzuncu Yil University. Non-smoker freshman (n = 71) and senior (n = 41) students of dentistry school with no systemic disease who had not use antibiotics in the last 6 months were informed about the aims and methods of the research and those who volunteered were included in this study. Informed consent was obtained from all of the participants, and their demographic information including age and gender was recorded.

Design of the study

The Turkish version of the Corah-DAS (C-DAS), a scale that is used frequently to assess the dental anxiety level, was administered to the subjects in this study.¹¹ In addition, all of the participants were asked how many times they visited a dentist in a year. Then, the gingival index (GI), plaque index (PI), bleeding on probing (BOP), probing depth (PD), and clinical attachment level (CAL) values were measured and recorded for the evaluation of their periodontal status. The decayed, missing, and filled teeth (DMFT) index findings of all the participants were also evaluated.

Measurements

C-DAS questionnaire: C-DAS, consisting of four questions, is used to measure dental anxiety. The scores of this scale range from 1 to 5: 1 = no anxiety and 5 = high anxiety. The Turkish version of this scale, which was previously found to be suitable for the Turkish population [internal consistency coefficient (α) = 0.81, correlation coefficient (r) = 0.71], was administered to the participants.¹¹ All of the questions on the scale were answered by them based on their personal thoughts. A score under 8 points was evaluated as "no anxiety", between 9-12 points was "middle level anxiety", 13-14 points was "high anxiety", and 15-20 points was "serious anxiety". Corah defined individuals as having "high dental anxiety" with a score of 13-20 points on this scale.¹² The purpose of selecting this scale was that the scale is short, accessible, and easy to understand.

Oral health indicators: The periodontal assessments were performed with a Williams periodontal probe based on various accepted scales indicating gingival health. No interventional procedures were applied during these examinations. The variables were assessed in six regions (mesiobuccal, midbuccal, distobuccal, mesiolingual, midlingual, and distolingual) with the exception of the wisdom teeth (third molars). All of the examinations were applied by the same clinician.

The PI scoring¹³ was as follows: 0 = no plaque, 1 = invisible plaque but can be detected with a probe, 2 = visible plaque in the form of a thin band adjacent to the marginal gingiva with being non-visible at interdental space, and 3 = plaque in the form of a thick band adjacent to the marginal gingiva and filling the interdental space.

The GI scoring¹⁴ was as follows: 0 = no visual indication of gingival inflammation and no bleeding, 1 = slight change in the gingival color and texture but no bleeding, 2 = visual indications of gingival inflammation and bleeding when probing, and 3 = open inflammation indications and spontaneous bleeding.

The BOP¹⁵ was calculated as follows: BOP = number of bleeding regions/number of measured fields × 100.

PD was measured as the distance between the gingival margin and the gingival sulcus.

CAL was determined by measuring the distance between the gingival sulcus and the cemento-enamel junction.

The DMFT index was measured based on the World Health Organization (WHO)'s recommendation for epidemiological investigations.¹⁶ The missing tooth component (M) shows the teeth that are lost due to tooth decay and the teeth that are indicated for extraction. The filled tooth component (F) shows the teeth with solid permanent restorations.¹⁷ The DMFT score was evaluated with a probe and dental mirror, which are used routinely during the examinations in our clinic.

The statistical analyses were performed using the Number Cruncher Statistical System (NCSS) (version 07.1.20, NCSS, LLC, Kaysville, Utah, USA). Descriptive statistics were used, with the mean and standard deviation (SD) for the continuous variables and the median, frequency, percentage, minimum, and maximum for the discrete variables. The Shapiro-Wilk test was used to determine the normality of the data. The independent samples t-test was used to compare the means of two groups with normal distributions, and the Mann-Whitney U test was used to compare two groups of quantitative variables without normal distributions. The Pearson chi-square test and Fisher-Freeman-Halton test were used to compare the qualitative data. Statistical significance was accepted as $P < 0.0500$.

Results

The age of the students who participated in the study ranged from 18 to 34 years old, with a mean of 21.43 ± 2.65 . The gender ratio was 1:1 [50% (n = 56) each for men and women]. The freshman student ratio was 63.4% (n = 71) and the senior student ratio was 36.6% (n = 41). The descriptive statistics and the frequencies of the students' dental visits are given in table 1. There was a significant difference between the freshman and senior students (groups) with regard to the age ($P = 0.0001$). There was a statistically significant difference between the groups for the dental visit frequency ($P = 0.0001$). Most of the senior students reported their dental visit frequency as at least once every 6 months, and there was no senior student who did not visit a dental clinic in a year.

The C-DAS score for men was 7.68 ± 2.04 and it was 8.38 ± 2.83 for the women. There was no statistical difference in the C-DAS scores between the genders ($P = 0.1370$). In the freshman students, the C-DAS score was significantly higher than that of the senior students in terms of the total points ($P = 0.0160$). The results of all the questions are shown in detail in table 2.

Table 1. Descriptive statistics and comparison of the two groups

Variable	Total (n = 112)	Freshman (n = 71)	Senior (n = 41)	P	
Age (year) (mean ± SD)	21.43 ± 2.65	19.87 ± 1.53	24.12 ± 1.93	0.0001 ^{*#}	
Gender [n (%)]	Men	56	33 (46.5)	0.3270 [¥]	
	Women	56	38 (53.5)		18 (43.9)
Frequency of dental visits [n (%)]	None	11	11 (15.5)	0.0001 ^{*†}	
	Sometimes	15	9 (12.7)		6 (14.6)
	In case of complaint	48	37 (52.1)		11 (26.8)
	One per 6 months	25	5 (7.0)		20 (48.8)
	One per a year	13	9 (12.7)		4 (9.8)

[#]T-test for the independent samples; [¥]Pearson chi-square test; [†]Fisher-Freeman-Halton test; *P < 0.0100
SD: Standard deviation

The GI, PI, and BOP values of the freshman students were significantly higher than those of the senior students (P = 0.0001, P = 0.0001, P = 0.0001, respectively).

However, there was no statistical significant difference between the PD and CAL measurements (P = 0.3670, P = 0.2020, respectively) (Table 3).

Table 2. Evaluation of Corah Dental Anxiety Scale (C-DAS) questions according to the total points of the groups

Questions	Answer	Freshman	Senior	P
		(n = 71) n (%)	(n = 41) n (%)	
If you had to go to the dentist tomorrow, how would you feel about it?	I would look forward to it as a reasonably enjoyable experience	9 (12.7)	5 (12.2)	0.4610 [€]
	I wouldn't care one way or the other	22 (31.0)	19 (46.3)	
	I would be a little uneasy about it	33 (46.5)	16 (39.0)	
	I would be afraid that it would be unpleasant and painful	5 (7.0)	1 (2.4)	
	I would be very frightened of what the dentist might do	2 (2.8)	0 (0)	
When you are waiting in the dentist's office for your turn in the chair, how do you feel?	Relaxed	23 (32.4)	19 (46.3)	0.0410 ^{**€}
	A little uneasy	35 (49.3)	21 (51.2)	
	Tense	13 (18.3)	1 (2.4)	
	Anxious	0 (0)	0 (0)	
	So anxious that I sometimes break out in a sweat or almost feel physically sick	0 (0)	0 (0)	
When you are in the dentist's chair waiting while he gets his drill ready to begin working on your teeth, how do you feel?	Relaxed	19 (26.8)	14 (34.1)	0.3960 [€]
	A little uneasy	38 (53.5)	19 (46.3)	
	Tense	9 (12.7)	8 (19.5)	
	Anxious	4 (5.6)	0 (0)	
	So anxious that I sometimes break out in a sweat or almost feel physically sick	1 (1.4)	0 (0)	
You are in the dentist's chair to have your teeth cleaned. While you are waiting and the dentist is getting out the instruments which he will use to scrape your teeth around the gums, how do you feel?	Relaxed	16 (22.5)	20 (50.0)	0.0270 ^{**€}
	A little uneasy	43 (60.6)	16 (40.0)	
	Tense	8 (11.3)	4 (10.0)	
	Anxious	3 (4.2)	0 (0)	
	So anxious that I sometimes break out in a sweat or almost feel physically sick	1 (1.4)	0 (0)	
C-DAS total point	Mean ± SD	8.45 ± 2.61	7.29 ± 2.05	0.0160 ^{**#}
	Minimum-maximum (median)	4-18 (9)	4-11 (7)	

[#]T-test for the independent samples; [€]Fisher-Freeman-Halton test; ^{**}P < 0.0500
C-DAS: Corah dental anxiety scale; SD: Standard deviation

Table 3. Comparison of the groups according to gingival index (GI), plaque index (PI), bleeding on probing (BOP), probing depth (PD), and clinical attachment level (CAL)

Periodontal measurements	Freshman (n = 71)	Senior (n = 41)	P
	Mean ± SD	Mean ± SD	
GI	1.36 ± 0.63	0.75 ± 0.46	0.0001* [#]
PI	1.27 ± 0.68	0.81 ± 0.46	0.0001* [#]
BOP	57.50 ± 32.19	35.22 ± 23.96	0.0001* [#]
PD	1.59 ± 0.32	1.53 ± 0.31	0.3670 [#]
CAL	1.60 ± 0.32	1.52 ± 0.27	0.2020 [#]

[#]T-test for the independent samples; *P < 0.0100

GI: Gingival index; PI: Plaque index; BOP: Bleeding on probing; PD: Probing depth; CAL: Clinical attachment level; SD: Standard deviation

When the DMFT index was examined, it was found that the index score of the freshman students was significantly higher than that of the senior students (P = 0.0001). All of the details and statistics from the DMFT index are provided in table 4.

Discussion

We aimed with this study to combine the oral health findings with the dental anxiety in Turkey. Studies about the dental anxiety and dental fear of dental students in Turkey are available,^{18,19} but studies associating the dental anxiety with oral health are limited. We believed that such a study in a limited and controversial population, like dentistry students, would reduce the bias to minimum.

The Turkish version of the C-DAS was used to measure the dental anxiety of freshman and senior students in our study. According to Seydaoslu et al., the validity and reliability of the Turkish version of the C-DAS was appropriate for all age groups.¹¹ None of the freshman and senior students

who participated in our study received more than 12 total points from the survey of C-DAS. Corah et al.¹² described those individuals who obtained 12 points and above from the survey as anxious. The dental anxiety levels of the Turkish population, according to two separate studies conducted in 2005 and 2006, were 23.5% and 21.3%, respectively.^{20,21} Based on these rates, the dental students of Van Yuzuncu Yil University may be less anxious than the general Turkish population. In this study, there was no statistical difference between men and women according to the C-DAS, similarly to the literature.^{3,22-25}

The results of this study revealed that the anxiety level of the senior students was less than the freshman students. This situation was expected when compared with the literature.^{18,19,24,25} Researchers have attributed these results to the fact that education is related to dental anxiety, and the increase in educational attainment (especially in relation to dental practices) can reduce dental anxiety.

Table 4. Comparison of groups for decayed, missing, and filled teeth (DMFT) index

Scores		Freshman (n = 71)	Senior (n = 41)	P [#]
Decayed teeth	Mean ± SD	2.27 ± 2.45	0.46 ± 1.27	0.0001* [#]
	Minimum-maximum (median)	0-10 (1)	0-7 (0)	
Missing teeth	Mean ± SD	0.63 ± 1.14	0.32 ± 0.61	0.2860
	Minimum-maximum (median)	0-5 (0)	0-2 (0)	
Filled teeth	Mean ± SD	2.30 ± 2.50	1.71 ± 2.66	0.1070
	Minimum-maximum (median)	0-8 (2)	0-12 (0)	
DMFT	Mean ± SD	5.20 ± 3.42	2.49 ± 3.20	0.0001* [#]
	Minimum-maximum (median)	0-13 (5)	0-14 (1)	

[#]Mann-Whitney U test; *P < 0.0100

DMFT: Decayed, missing, and filled teeth; SD: Standard deviation

Among the freshman students who were asked about their dental visits in one year, there were students who did not visit the dentist at all. However, all of the senior students visited the dentist at least once a year. According to the literature, whether an individual goes to the dentist at regular intervals or not and the number of dental visits per year can provide information to the dentist about the individual's dental anxiety;²⁶ because, it has been reported that there is a correlation between dental fear and fewer dental visits.^{27,28} In the light of this information, as the awareness and education of students about dental practices increase, we can say that frequency of dental visits increases and anxiety level decreases similarly to the literature.

In our study, it was concluded that because the decayed teeth score (D) was higher, the freshman students had more dental anxiety. However, there is no statistical significant difference between the groups according to missing teeth score (M). Schuller et al. reported that people with more dental anxiety had more decayed and missing teeth, and they had fewer dental visits. They also reported that elderly individuals wanted to have their teeth removed instead of being treated, but younger people chose to restore their decayed teeth.²⁹ Our study results may be due to the young sample population.

The GI, PI, and BOP values of the senior students were lower than those of the freshman students that could be attributed to dental anxiety, because previous studies have reported that dental anxiety is associated with poor oral hygiene, bleeding gums, and increased dental needs.^{30,31} In terms of the PD and CAL, no statistical difference was found between the two groups. The GI, PI, and BOP values are associated with poor oral hygiene, whereas the PD and CAL values are associated with advanced periodontal disease.³² This is mostly due to the cumulative effects and aging, so the result in terms of the PD and CAL can be explained

also by the young age of the students.

In our study, the senior students had less dental anxiety and gave more importance to dental visits; thereby, they had the ability to provide oral health more effectively. Boyce et al. reported that the most important obstacle blocking individuals from receiving oral health services was pain and anxiety towards them.³³ Researchers emphasize that the treatment strategies are updated daily in dentistry, and that new topical and local anesthetic agents are being created which can minimize pain. They also argue that it is an obligation for dentists to share this progress with their patients and to educate them about oral health. In this way, the pain and dental concerns that individuals may feel during their procedures may be reduced.³³ So, our results can be attributed to the fact that senior students are better equipped for oral health and dental practices and these points are compatible with the literature.

Even though sociocultural status and education levels of our sample are better than the general population, the difference in the anxiety levels of the two groups emphasizes the importance of awareness on dental practices.

Implementing this study among dental students in order to remove bias does bring a number of limitations. One of them was that the age of the participants was young, and it does not refer to the whole population. In addition, different socioeconomic status and various educational levels were not included in this study. Moreover, there is a correlation between dental anxiety and psychological status, and these psychological conditions were not examined in this study. Finally, a general population without any relationship with dental education could be included as a control group.

Conclusion

In light of the findings of this study, we can say that dental anxiety decreases as awareness and consciousness increase in terms of dental practice. It is also clear that

the oral health status of more anxious people is weak. Individuals with high dental anxiety make fewer visits to the dentist, but they often need more dental treatments. Planning projects to increase the community's awareness level about dental practices may be beneficial, because properly-informed individuals can exhibit lower dental anxiety, an increased number of routine dental visits,

and healthier oral hygiene.

Conflict of Interests

Authors have no conflict of interest.

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