

Dental Anxiety in Relationship to Demographic Status and Periodontal Health in Adults

Dental Anksiyetenin Periodontal Sağlık ve Demografik Durum ile İlişkisi

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Abstract

Objective: Dental anxiety is a major complication for many patients and practitioners. Dental fear often results in poor oral health in regard to poor cooperation. The aim of the present study was to determine the dental anxiety and its relation to socio-demographic status and periodontal health in adults.

Materials and Methods: In this cross-sectional study, a total of 187 patients were asked to complete a questionnaire consisted of the questions gathering information on sex, age, education level, income level, smoking habits and the last dental visit. The questionnaire also included Modified Dental Anxiety scale (MDAS) administered in Turkish language. The oral health status was determined with Community Periodontal index (CPI).

Results: Based on MDAS scores, 54% of the subjects had mild anxiety, 41.7% had moderate anxiety, and 4.3% had severe anxiety. Anxiety was affected by age and gender ($p<0.05$), but monthly income, education level, or smoking status had no effect on dental anxiety ($p>0.05$). Participants with higher CPI scores had significantly higher dental anxiety compared to those of lower CPI scores ($p<0.05$).

Conclusion: Encouragement of young individuals for regular dental visits since childhood would help to lower the dental anxiety. Frequent dental visits might prevent the negative dental experiences and contribute to decrease the dental fear.

Keywords

Dental anxiety, periodontal status, Modified Dental Anxiety scale

Anahtar Kelimeler

Dental anksiyete, periodontal durum, Modifiye Dental Anksiyete ölçeği

Received/Geliş Tarihi : 30.06.2017

Accepted/Kabul Tarihi : 20.11.2017

doi:10.4274/meandros.70298

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Öz

Amaç: Diş hekimi korkusu nedeniyle hastaların gerekli diş tedavilerinden kaçınması ağız sağlığını olumsuz yönde etkiler. Bu çalışmanın amacı dental anksiyete ile sosyo-demografik durum ve periodontal sağlık arasındaki ilişkinin araştırılmasıdır.

Gereç ve Yöntemler: Bu kesitsel çalışmaya dahil edilen 187 hastadan cinsiyet, yaş, eğitim düzeyi, gelir düzeyi, sigara içme alışkanlıkları ve son diş hekimi ziyareti ile ilgili ankete yanıt vermeleri istendi. Hastalara yöneltilen ankette Türkçe olarak düzenlenmiş Modifiye Dental Anksiyete ölçeği (MDAS) de yer aldı. Periodontal durum [Community Periodontal index (CPI)] ile belirlendi.

Bulgular: MDAS düzeylerine göre, olguların %54'ünde hafif anksiyete, %41,7'sinde orta düzeyde anksiyete ve %4,3'ünde ciddi anksiyete gözlemlendi. Anksiyetenin, yaş ve cinsiyete bağlı olarak değiştiği ($p<0,05$), ancak aylık gelir, eğitim düzeyi veya sigara içme durumundan etkilenmediği belirlendi ($p>0,05$). CPI skoru daha yüksek olan bireylerde MDAS düzeyleri, düşük CPI skoruna sahip bireylere kıyasla, anlamlı derecede yüksek bulundu ($p<0,05$).

Sonuç: Çocukluk döneminden itibaren diş hekimi ziyaretleri için genç bireylerin teşvik edilmesi, dental anksiyeteyi azaltmaya yardımcı olacaktır. Sık diş hekimi ziyareti, olumsuz deneyimleri engelleyebilir ve diş hekimi korkusunu azaltmaya katkıda bulunabilir.

Introduction

Dental anxiety is a common problem for considerable number of patients and often results in inadequate oral health by less frequent dental visit, avoidance of dental treatment and poor cooperation (1-6). Several studies have evaluated the prevalence of dental anxiety range approximately 5% to 30% depending on the population and measurement technique used (4,6-8). Liu et al. (6) assessed dental anxiety among Chinese population and reported that 5% were suffering from dental phobia. In a Spanish population Rodriguez Vazquez et al. (8) assessed the stress before dental treatment and found that 10% patients scored high values stress. Thomson et al. (7) investigated New Zealand adults with a postal survey and observed that dental anxiety was reported by 20.8 per cent of respondents. In Turkish population, approximately 21%-24% of individuals experienced dental anxiety (4,9,10). The etiology of dental anxiety is a multidimensional real or imaginative stimulus that leads to development of fear (11). It is likely to have been created by several factors such as general fearfulness, past traumatic experiences and negative information based on narratives offered by family or social environment (12,13). People with high levels of dental anxiety might neglect their oral hygiene and have tendency to suspend dental treatment unless they suffer from severe pain. Eventually, dental anxiety becomes a veritable vicious circle that leads to worse oral health and may cause embarrassment associated with deterioration of social life (14). It has been reported that individuals with high dental anxiety more likely to have more missing teeth, more caries and worse oral hygiene in comparison to non-anxious individuals (15,16). Self-reported questionnaires and anxiety rating scales place different degrees of emphasis on dental fear, which is expressed as changes in thoughts, physiological state and behavior by the population (17). These dental anxiety questionnaires show adequate levels of internal consistency (10). Modified Dental Anxiety scale (MDAS) is a quick and brief, 5 item questionnaire adapted from Corah's Dental Anxiety scale (DAS) (18) developed by Humphris et al. (19). An advantage of MDAS is that, it is cost

effective instrument for population-based research. Also, MDAS was developed to improve validity of DAS by adding a question about administration of local anesthetic (1). MDAS has been found reliable and valid cross culturally and has been translated into different languages including Turkish (10). Individuals with periodontal disease are likely to report negative impacts in their oral health and express high general anxiety (20). Anxiety, depression and stress are not yet confirmed as definite risk factors of periodontal disease, but they are considered as potential factors affecting the occurrence, development and prognosis of periodontal disease (21,22). Limited number of studies has been performed to investigate the relationship between dental anxiety and periodontal status in Turkey up to now (4,23-25). As periodontal health status is an important factor affecting dental fear (26,27) we hypothesized that greater indications of periodontal disease [i.e., higher Community Periodontal index (CPI) scores] were expected to be related to higher dental anxiety. Therefore, in the present study it is aimed to determine dental anxiety and its relation to demographic and periodontal status of patients who referred to Ege University Faculty of Dentistry.

Materials and Methods

Patient's Recruitment

This cross-sectional study was conducted among a sample of 187 patients attending Ege University Faculty of Dentistry, in the period spanning from September 2014 to March 2015. The purpose and procedures were fully explained to all participants prior to participation and written informed consent was obtained from all those wishing to participate in accordance with Helsinki Declaration. This study was reviewed and approved by the Ethical Committee of Ege University Faculty of Medicine (approval no: 15-9.1/13). Inclusion criteria were age equal to or over 18 and agreement to participate in the study. Those who reported history or undergoing of psychological therapy, presented illiteracy and non-cooperation or took sedative agents 3 days before the survey were excluded from the study.

Data Collection and Questionnaires

Initially, all patients were asked to fill a questionnaire. The questionnaire consisted of two sections. The first section contained questions gathering information on sex, age, education level, income levels, smoking habits and when they had last visit to the dentist. In the second section of the questionnaire, in order to assess dental anxiety, the patients were asked to complete MDAS administered in Turkish language (10). This scale includes 5 brief multiple-choice questions. And each question has a consistent answering scheme ranging from “not anxious” with a value of 1 and “extremely anxious” with a value of 5. Also, periodontal status of the subjects was evaluated using CPI (28). The higher CPI scores refer the worsening periodontal status. One calibrated examiner (G.E.) was performed CPI measurements through examination. The intra-examiner reproducibility of the researcher for CPI measurements was evaluated with a manual periodontal probe, and the interclass correlation coefficient was 88%.

Statistical Analysis

Differences between categorical variables were compared by using a chi-square or Fisher’s exact test. Adjustment for gender has been performed for statistical analysis. The Shapiro-Wilk test was used to determine whether data were distributed normally. Data was not normally distributed, so group comparisons were performed by Mann-Whitney U test. Statistical analyses were performed using a statistical package (SPSS Inc., Ver. 20.0, Chicago, IL, USA). Differences were considered significant when p value was <0.05.

Results

Demographic characteristics of the patients are presented in Table 1. The study population comprised 110 females and 77 males (mean age 38 ± 13 years, age range, 20 to 69 years). Mean anxiety level of the study subjects was 10.5 ± 4.18 . Based on MDAS scores, 54% of the subjects were identified to have mild anxiety (5-10 total score), 41.7% were moderately anxious (11-18 total score), and 4.3% were suffering from high dental anxiety or dental phobia (19-25 total score). The results of the present study demonstrated that number of females who had moderate dental anxiety was significantly higher than males ($p=0.04$).

Similarly, older subjects had significantly lower levels of dental anxiety than younger participants ($p<0.001$). Dental anxiety was not affected by monthly income, education level ($p>0.05$). The results also exhibited that dental anxiety was not related with smoking status of the study participants ($p>0.05$). There was no significant difference in dental anxiety between participants with and without systemic disease ($p>0.05$). Dental anxiety of participants who visited the dentist in last one year was not different from the other participants who did not visit the dentist ($p>0.05$). Participants with higher CPI scores had significantly higher dental anxiety compared to those of lower CPI scores ($p=0.033$) (Table 1).

Discussion

This cross-sectional study evaluated the dental anxiety among patients who referred to Ege University Faculty of Dentistry for different dental treatment needs. Our results demonstrated that dental anxiety was related to gender, age and periodontal disease severity, but not with monthly income, education level, smoking and systemic disease status. Having a visit to a dentist in last one year was not found to be associated with dental anxiety. In the present study, the level of high dental anxiety was 4.3%. Similar findings were found in a study by Prathima et al. (29) with 4.4%, Moore et al. (30) with 4.2% and Locker et al. (31) with 4.4% high dental anxiety. However, Humphris et al. (32) found greater percentages of high dental anxiety with 11%. In the present study subjects who referred to a dental school were included, in contrast Humphris et al. (32) used a structured interview on telephone in UK adults. It has been demonstrated that high dental anxiety level was the underlying cause for the avoidance of dental appointments (33). Therefore, selection of the study population from subjects attending dental clinics might be the reason for lower percentages of high dental anxiety as it was demonstrated in the present study. In the present study, the prevalence of dental anxiety was significantly higher in females than males, which was consistent with literature (17,30,34-36). Similarly, in Chinese population Liu et al. (6) stated that women were considered more anxious than men. The difference in dental anxiety between females and males might be possibly due to personality and psychological state, as women are being more likely

to express their fears than men (37). In addition, a physiological research on human responses to pain stimuli has shown that women exhibit lower tolerance to pain than men (38). A significant negative correlation between age and dental anxiety has been repeatedly reported in community samples from developed countries (19,32). Humphris et al. (19,32) reported that younger subjects were more anxious than older ones among English population. In a cross-sectional study, Deogade and Suresan (39) found that younger patients were more anxious compared to their elder counterparts in Indian adult population. Also, Liddell and Locker (40) evaluated the relationship between age and dental anxiety in a Canadian population and stated that older adults

reported less painful dental experiences than young adults. Similarly, Yildirim (4) found that young patients had significantly higher scores than others in a Turkish population. Our findings are in accordance with these studies (4,19,32,40). In the present study, younger subjects had significantly higher dental anxiety than older participants. Post exposure to various diseases and treatments, increased ability to cope with negative experiences might be the explanations of not having high dental anxiety for older subjects. Also, high dental anxiety in younger participants could be due to the less experience of the dental instruments compared to older subjects. According to Fardal et al. (26) and Fardal and Hansen (27) periodontal status is an important factor affecting dental fear.

Table 1. Socio-demographic characteristics of participants according to their dental anxiety levels

	Anxiety score mild	Anxiety score moderate	Anxiety score high	p
Total n (%)	101 (54)	78 (42)	8 (4)	
Gender (%)				
Female/male	51/49	70/30	63/37	0.04
Age (%)				
20-29	44	45	11	0.001
30-39	44	50	6	
40-49	48	52	0	
50-59	76	21	3	
60-69	92	8	0	
Monthly income (TL) (%)				
<1000	50	47	3	0.441
1000-2000	58	38	4	
>2000	58	33	9	
Education level (%)				
Elementary school	54	42	4	0.989
Secondary school	51	45	4	
University	57	38	5	
Smoking (%)				
Current	44	53	3	0.357
Non-smoker	59	37	4	
Former smoker	59	35	6	
Systemic disease (%)				
Yes/no	29/71	35/65	13/87	0.368
Last dental visit within one year (%)				
Yes/no	43/57	41/59	25/75	0.623
CPI (%)				
1	14	9	0	0.033
2	60	54	38	
3	21	28	25	
4	5	9	37	
Number of teeth (n)	23	24	26	0.157

CPI: Community Periodontal index, Periodontal attachment loss, bone loss and, ultimately, possible tooth loss, epi-bold number indicates statistical significance (p<0.05)

Stress, depression and anxiety are not yet confirmed as definite risk factors for periodontal disease but considered as potential risk factors in the concurrency and progression of periodontal disease (20,21). Boyce et al. (41) suggested that fear and anxiety continue to be the main reason patients avoid or do not follow up with dental care. Individuals with high dental anxiety would postpone dental treatments and delayed treatment might lead to more painful interventions and this experience might exacerbate the person's level of dental fear, this situation described as "vicious cycle" (42). Dental fear appears to play an important role in this cycle, not only affecting the likelihood that people will delay going to the dentist, also modifying the association between dental avoidance and subsequent treatment need (43). Patients attending a dental faculty were selected in the present study. However, subjects with high dental anxiety may not ask for dental treatment unless they had to, and this situation might be the cause of lower percentages of high dental anxiety in the present study. Subjects with higher CPI scores showed significantly higher dental anxiety compared to those of lower CPI scores in the present study. Our results were in accordance with the studies by Yildirim (4) and Talo Yildirim et al. (24) reported that periodontal status was better in patients those had low and moderate dental fear scores compared to patients that had high dental fear scores. On the other side, Sezer et al. (25) and Ay et al. (23) have found no statistically significant difference on dental anxiety levels related to periodontal status. Conflicting results among studies may be explained by the fact that periodontal disease severity of the patients was different among studies (4,23-25). Periodontal disease is usually painless and chronic; therefore patients do not become sufficiently aware and anxious before it reaches a certain level (5,25). In order to determine whether periodontal disease severity really affect the level of dental anxiety, it is useful to conduct studies in different groups in terms of periodontal health status. A sample to fully represent the society may reveal different findings as it may involve individuals with both anxiety levels and different periodontal health levels. Our study has some limitations. Previous distressing experiences are often cited as the major factor in the development of dental anxiety (43,44). In the present study, previous negative dental experiences have not been evaluated.

Further research including this topic is needed to clarify the role of previous dental experiences in the genesis of dental anxiety. The other limitation is the CPI index system. CPI index is based on a hierarchical concept of the progression of periodontitis, shows that a tooth with a score of 3 or 4 (a pocket present) should also have calculus present (score 2) and bleeding (score 1) (45-47). Also, it does not measure tooth mobility or attachment loss or furcation involvement (48,49). Additionally, full mouth assessments including existent/filled/decayed teeth of the patient provide more precise information about oral health (50). Therefore, further studies including whole oral assessment would help to evaluate the relationship between oral health and dental anxiety. Lastly, the present cross-sectional study has been conducted on a limited population who referred to a dental school in Izmir. The cross-sectional design might be insufficient to demonstrate whether dental anxiety worsens periodontal health or presence of periodontal disease causes dental anxiety. Also, subjects with high dental anxiety would not ask for dental treatment unless they had to, and this situation might have affected the number of subjects with dental phobia in the present study. Therefore, multicenter studies with larger populations are needed to reveal the prevalence and severity of dental anxiety in Turkish population.

Conclusion

The present study indicates that females and young people have higher dental anxiety than males and older people. Since younger people had higher dental anxiety, encouragement of these people for regular and more often dental visits would help to lower the dental anxiety. Also, within the limits of this study the results showed that severity of periodontal disease might be the result of dental anxiety and vice versa. In order to determine whether periodontal disease severity really affect the level of dental anxiety, it is useful to conduct studies in different groups in terms of periodontal health status.

Ethics

Ethics Committee Approval: Ethical Committee of Ege University Faculty of Medicine (approval no: 15-9.1/13).

Informed Consent: Written informed consent was obtained from all those wishing to participate in

accordance with Helsinki Declaration.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: G.E., Concept: G.E., Design: G.E., Data Collection or Processing: G.E., O.T., Analysis or Interpretation: O.T., Literature Search: O.T., Writing: G.E., O.T.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

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