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ORAL HYGIENE HABITS AND ORAL HEALTH STATUS OF FEMALE ADOLESCENTS UNDER STATE PROTECTION: A PILOT STUDY

Çocuk Esirgeme Kurumundaki Kız Ergenlerin Ağız Hijyeni Alışkanlıkları ve Ağız Sağlığı: Bir Pilot Çalışma

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ABSTRACT

Purpose: The aim of this study is to evaluate oral health status and oral hygiene practices of female adolescents under state protection. **Subjects and Methods:** Fifty-five female participants between the age of 12 and 18 who are under the care of The Child Protection Institution were included in this study. Self-administered questionnaires were used to obtain information regarding knowledge of oral health and habits. Dental caries status was scored according to the criteria of the World Health Organization (WHO), using the indices of Decayed (D), Missing (M), Filled (F), Surfaces (S) (DMFS). In addition, Gingival Index (GI) and Plaque Index (PI) were recorded during periodontal assessment. Data were statistically analyzed by using Oneway analysis of variance, Tukey's HSD and Student's t tests. **Results:** Fourteen children had dental fear and 52.7% of them were not satisfied with their esthetic appearance. Although 78.2% of the children knew that brushing prevents dental caries, only 18 of them were brushing regularly twice per day. Mean DMFS, GI and PI scores were 13.18±5.68, 1.35±0.37 and 1.33±0.45, respectively. Only 20% of the children were using dental floss. There was statistically no significant difference between the DMFS scores of the children in terms of flossing. However, the difference between the mean GI and PI of the same group was found to be statistically significant ($p<0.05$). **Conclusion:** Children under state protection were found to have a reasonable knowledge of the causes of dental caries and gingival bleeding. Therefore, adequate management of this positive attitude can significantly improve the oral health of this population.

Keywords: Female adolescents; institutionalized; oral health; habits; orphans

ÖZ

Amaç: Bu çalışmanın amacı, Çocuk Esirgeme Kurumu (ÇEK)'ndaki çocukların ağız sağlığı durumlarını, bilgilerini ve alışkanlıklarını değerlendirmektir.
Hastalar ve Yöntem: ÇEK'nda ikamet eden, yaşları 12-18 arasında değişen 55 kız çocuğunun ağız sağlığı bilgileri ve alışkanlıkları doldurdukları anket formları kullanılarak değerlendirilmiştir. Çocukların çürük düzeyini ölçmek için Dünya Sağlık Örgütü (WHO) kriterlerinden DMFS; Decayed (Çürük), Missing (Eksik), Filled (Dolgulu), Surface (Yüzey) İndeksi, periodontal bulguları değerlendirmek amacıyla da Gingival İndeks (Gİ) ve Plak İndeksi (Pİ) kullanılmıştır. Çalışmanın verileri Tek yönlü varyans analizi, Tukey HSD ve Student t testleri kullanılarak istatistiksel olarak analiz edilmiştir.
Bulgular: On dört çocuğun diş hekimliği korkusu olduğu belirlenmiştir. Çocukların % 52,7'si estetik görünüşlerinden memnun olmadıklarını belirtmişlerdir. Çocukların %78,2'si diş fırçalamanın diş çürüklerini önlediğini bilmesine rağmen sadece 18 çocuk her gün düzenli olarak sabah ve akşam dişlerini fırçalamayı tercih etmektedir. Çocukların ortalama DMFS skoru 13.18±5.68, GI skoru 1.35±0.37 ve Pİ skoru 1.33±0.45 olarak hesaplanmıştır. Sadece 11 çocuk (%20) diş ipi kullandığını belirtmiştir. Diş ipi kullanan çocuklar ile kullanmayan çocuklar DMFS skorları açısından karşılaştırıldıklarında, istatistiksel olarak anlamlı bir fark görülmezken, aynı grubun ortalama Gİ ve Pİ skorları arasında istatistiksel olarak anlamlı bir fark bulunmuştur ($p<0.05$).
Sonuç: ÇEK'nda ikamet eden kız çocuklarının diş çürüklerinin ve dişeti kanamalarının sebeplerini bildiği anlaşılmaktadır. Bu topluluğun ağız sağlığı olumlu davranışların iyi yönetilmesi ile belirgin bir iyileşme gösterebilir.

Anahtar kelimeler: Ergen genç kızlar; bakım kurumu; ağız sağlığı; alışkanlıklar; yetim

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Introduction

Good oral health is an integral component of general health (1). Of all the oral diseases, the most commonly encountered oral pathologies are dental caries and periodontal diseases (2-4). Dental caries is a global health problem and the most prevalent disease, especially in children and adolescents (2-5). Poor oral hygiene is known as an important predisposing factor for periodontal diseases (6). To overcome these health problems and to maintain oral health, tooth brushing is found to be the most effective hygiene practice (7). Brushing the teeth twice daily with fluoridated toothpaste is the primary preventive method to maintain a good oral hygiene. Other equally important preventive methods are flossing, applying fluorides, minimal consumption of sugar containing foods and regular visits to the dentist (8, 9). Studies have shown that factors such as age, gender, race, diet, oral hygiene habits, socio-economic level and education are important determinants for oral and dental health (10-13). An increase in the level of knowledge of oral health leads to an increased awareness of oral health and better oral hygiene practices (10, 13). Similarly, people with more positive attitude toward oral health are influenced better by education on dental care (13). Studies have shown that appropriate education on dental care can help to cultivate a better oral health practice (10, 12, 14). Children having socially disadvantaged background such as orphans are one of the high-risk groups. Due to low utilization of dental care, seldom-received preventive services, inadequate oral care, poor oral health education and oral hygiene practices, these children represent a high prevalence of dental caries and periodontal diseases (14-18). These children are often unable to benefit from the oral health knowledge due to poor access to the specialized professionals (13). Since these children are usually institutionalized, they form a perfect group to study the oral hygiene status and habits, oral hygiene practices and the influence of oral health knowledge. The aim of this study was to examine the oral health status, knowledge, habits and oral hygiene practices of children under state protection.

Subjects and Methods

Study participants

The present cross-sectional descriptive study was carried out on children under state protection who were residing in Government-operated Protection Institution for Girls in Istanbul, Turkey. The children and the officials were informed about the objectives of the study and the informed consents were obtained from the Institution officials. In addition, the study was approved (Reg. No: 121) by the Ethical Committee of the Istanbul Aydin University, Faculty of Dentistry. Institution was visited twice, all the residents were invited for the clinical examinations, and the participation was optional. The total estimated sample size was determined as 55 subjects (N=55), to detect the mean differences of the clinical results (PI, GI, and DMFS) among different parameters (i.e. frequency of brushing, using dental floss, previous knowledge of oral health) with a statistical power of 80%. 55 adolescent females, who were between 12 and 18 years old (mean age: 15.56±1.38) were included in the study. Their demographic data, medical and dental history were obtained through questionnaires that were filled out by the children. Dental visits, dental fear, brushing habits, floss and mouth-rinse usage, smoking habits, systemic diseases, drug usage were evaluated by the questionnaire. Dental examinations were performed by one restorative dentist and one periodontist. Participants were examined in the dentist's room of the institution. Each subject was made to sit on a chair with the examiner standing behind or in front of the chair and the examination was carried out using examination instruments (mouth mirror, periodontal probe and explorer) and personal protective barriers (gloves and masks). The dental assistant using a standard form recorded data. The dental assistant seated in front of the examiner, so that the codes recorded can be seen by the examiner.

Caries status

The caries status was scored according to the criteria of the World Health Organization (WHO) using the indices of 'Decayed (D), Missing (M), Filled (F), and Surfaces (S)' (DMFS) for the teeth (19). Each tooth was examined; caries was recorded as present when there was obvious cavitation. All stages of caries that preceded cavitation were excluded and all questionable lesions were regarded as caries. Tooth brushing habits and periodontal status of the participants were also recorded. The evaluation was performed visually (20).

Periodontal assessment

Gingival Index (GI) was assessed depending on the gingival condition and the qualitative changes in each individual (21). The index was scored according to the following criteria: Score 0: Healthy gingiva.

Score 1: Mild inflammation, a slight color and texture change, no bleeding on probing (BOP). Score 2: Moderate inflammation, redness, edema and bleeding on probing. Score 3: Severe inflammation, marked redness, hypertrophy and tendency to spontaneous bleeding. Plaque index (PI) was scored according to the criteria of Sillnes and Löe (22). Score 0: No plaque. Score 1: A film of plaque adhering to the free gingival margin and/or adjacent tooth surface, recognized only by using a probe on the tooth surface, Score 2: Moderate accumulation of soft deposits within the gingival pocket or at gingival and/or tooth margin, which can be observed by naked eye. Score 3: Abundant soft deposit within the gingival pocket or at gingival and/or tooth margin. The periodontal measurements were instead of taken verb: recorded from four sites (mesio-vestibular, vestibular, disto-vestibular, and lingual) on six selected teeth (Ramfjord's teeth: 16, 21, 24, 36, 41, 44, teeth were numbered according to FDI classification). These teeth were selected due to testing as reliable indicators for different regions of the mouth (23).

Statistical analysis

Data was analyzed by using IBM Statistical Package for Social Sciences (SPSS) software for Windows (IBM Corp. Released 2013, Version 22.0. Armonk, NY, USA). Since the distribution of the data was found to be normal, One-way analysis of variance (ANOVA) for multiple comparisons followed by post-hoc Tukey's honestly significant difference (HSD) test for pair-wise comparisons and Student's t test were performed.

Results

Among 55 subjects, 25.5% (n=14) demonstrated signs of dental fear. The reasons for dental fear were negative stories heard from the others (71.4%), previous negative experiences (14.3%) and negative effect of movies (7.1%). According to the questionnaire responses, 52.7% (n=29) of the children were not satisfied with the appearance of their teeth. 32.7% (n=18) of the participants believed that, individuals should go for a regular dental control every 6 months and 69.1% (n=38) told that they previously went to the dentist. While 78.2% of the children (n=43) agreed that brushing could prevent caries, 54 (98.2%) mentioned that they were brushing on a regular basis. Ten children (18.2%) brushed occasionally when they remembered to do so and only 18 children brushed regularly twice daily in the morning and at night. Thirty-six of them (65.5%) indicated that they received oral health care information previously and 20 of them (36.4%) mentioned that they had scaling previously. Only 20% of the children (n=11) used dental floss and approximately half of the children 28 (50.9%) used mouth-rinses. Approximately half of the children (n=26) knew that they had dental caries. Thirty-three children (60%) claimed to have gingival bleeding, and 20 of them had spontaneous bleeding. Children's' mean DMFS, GI and PI scores were 13.18±5.68, 1.35±0.37 and 1.33±0.45, respectively. 65.5% (n=36) of the participants were not smoking, 29.1% (n=16) used a medication regularly and 16.4% (n=9) knew that they had a chronic medical disease.

There were no statistically significant differences in the periodontal indices and DMFS scores with regard to the presence or absence of dental fear. There were also no statistically significant differences in the periodontal indices and DMFS scores with regard to the previous visits to the dentist (Table 1). Although GI and the PI and the DMFS scores of the children who received oral health care information previously were numerically lower than the children who did not receive any information, only the mean plaque indices were found to be statistically significant ($p<0.05$) (Table 1).

There was no significant difference between the DMFS scores of the children who claim to be flossing when compared to those of who were not (Table 1). However, there was a statistically significant difference between the mean gingival indices and the plaque indices of the same groups ($p<0.05$) (Table 1).

The children who have reported to use mouth-rinse regularly and those who had previous periodontal treatment such as scaling did not show statistically significant difference in terms of GI, PI and DMFS scores when compared to their counterparts (Table 1).

The means of PI, GI, as well as DMFS scores of the children who claimed to brush their teeth occasionally when they remember, were found to be numerically higher than those of who brushed their teeth every day. According to the frequency of tooth brushing, PI scores of the children who claimed to brush regularly (every day) were found significantly lower than that of the children who claimed to brush occasionally when they remember, every two days, and less ($p<0.05$) (Table 2).

Table 1. *Mean and standard deviations (SD) of gingival index (GI), plaque index (PI) and the DMFS (Decayed, Missing, Filled, Surfaces) scores stratified by previous visits to the dentist, having dental fear, receiving oral health care information previously, using dental floss and mouthrinse, and having dental scaling previously.*

	Previous visits to the dentist		
	Yes	**No**	**p**
	Mean±SD	Mean±SD	
GI	1.33±0.41	1.39±0.29	0.576
PI	1.30±0.44	1.38±0.48	0.541
DMFS	13.97±5.47	11.41±5.91	0.123
Dental fear			
GI	1.32±0.44	1.36±0.35	0.743
PI	1.41±0.47	1.29±0.45	0.400
DMFS	14.21±3.72	12.83±6.21	0.325
Previous oral health care information			
GI	1.30±0.39	1.45±0.31	0.140
PI	1.24±0.45	1.49±0.41	0.049*
DMFS	12.69±5.17	14.11±6.6	0.386
Using dental floss			
GI	1.13±0.44	1.4±0.34	0.030*
PI	1.07±0.5	1.39±0.42	0.038*
DMFS	13.45±4.7	13.11±5.95	0.861
Using mouth-rinse			
GI	1.34±0.39	1.36±0.36	0.825
PI	1.25±0.44	1.41±0.46	0.191
DMFS	12.64±5.22	13.74±6.18	0.479
Previous dental scaling			
GI	1.42±0.27	1.31±0.42	0.284
PI	1.36±0.35	1.31±0.51	0.693
DMFS	13.55±5.11	12.97±6.05	0.720

**p<0.05 statistically significant. Student t Test*

Table 2. *Mean and standard deviations (SD) of the gingival index (GI), the plaque index (PI) and the DMFS (Decayed, Missing, Filled, Surfaces) scores stratified by the frequency of tooth brushing. The mean plaque indices of the children who brushed occasionally were statistically higher than the group who brushed every day.*

	Frequency of tooth brushing			**p**
	Occasionally	**Every two days and less**	**Everyday**	
	Mean±SD	**Mean±SD**	**Mean±SD**	
GI	1.48±0.29	1.3±0.25	1.26±0.45	0.123
PI	1.51±0.41	1.35±0.17	1.17±0.52	**0.041*- 0.032[a] a**
DMFS	13.5±5.76	15.1±6.17	12.16±5.42	0.373

**p=0.041; statistically significant. One-Way ANOVA test*
ap=0.032;statistically significant. post-hoc Tukey HSD test

Discussion

This study provided information on dental health status of children under state protection who reside in Child Protection Institution in Istanbul, Turkey. Even though the sample size was small, all children were interviewed thoroughly and it can be assumed that the results of this study provide an overview of the dental health status of children who are under state protection. In the present study, 38 children reported that they had visited a dentist previously (more than 50% had received information about oral health care previously, and 20 had previous tooth scaling). However, only 22 children were found to be satisfied with their dental appearance. This might be related to the poor oral hygiene habits of the children including ineffective brushing techniques, and irregular dental visits (15). In a study on the emotional and developmental disorders in orphans, Fawzy and Fouad (24) found that 45% of the subjects had anxiety. In a recent study, the effect of different life conditions on the development of dental anxiety was evaluated. Anxiety levels during dental treatment was found to be higher among non-orphan children (25). In the present study, 25.5% of the participants had dental fear. The most common reason for dental fear was the negative stories they have heard from others. These children with dental fear could probably have overcome this if they had visited the dentist regularly and if they had become accustomed to the dental treatment.

18 children believed that individuals should have regular dental controls in every 6 months, while 43 children agreed that brushing could prevent caries, and 25 children claimed that they were brushing every day. However, study data was not found to be consistent with these claims. Index values presented higher scores when compared to those reported in previous studies, which were obtained from similar groups that represent general population (2, 15).

Orphan children residing in institutions had more caries compared to the children living together with their families (15, 26, 27). For instance, mean DMFS scores of the orphans in Saudi Arabia and India were 3.49±3.31 and 7.11±4.14, respectively (15, 27). In an orphanage for girls in Mexico City, only 9.3% of children had no caries (26). In the present study, the DMFS scores were found to be higher than those of previous studies were. This might be related to the mean age of the participants that were included in this study, which was higher than that of the previous study groups and the children's poor oral hygiene status. Furthermore, the decay component was the major part of DMFS which indicates a higher percentage of untreated caries and therefore greater need for dental treatment (15). This is probably due to the limited access to the dental services in case of children who are under state protection, since they only use dental services in case of emergency such as pain and abscess formation (26). It is known that, the prevalence and the severity of periodontal diseases increase with age (10) and the dramatic values in these children might be worse. Therefore, the poor oral hygiene status of this group might be attributed to the lack of knowledge about correct oral hygiene practices among caretakers and concerned authorities, lack of motivation, low priority attributed to the dental care in the society, lack of facilities for regular oral health check-up's, cost of treatments, low dentist attendance and inadequate brushing (15, 16, 28). In a recent study, the schoolchildren were compared in terms of reinforcement of oral hygiene motivation. A statistically significant decrease in the PI scores was detected in the group with reinforcement. Authors also concluded that the periodic education had produced better results (29). Similarly, in the present study, the children who had previously received oral health care information, had statistically significantly lower mean PI scores than the children who did not receive any information ($p<0.05$). However, no statistically significant difference was found in terms of the PI and the DMFS scores between these two groups.

The institutionalized children had significantly poor oral hygiene (higher PI and GI scores) compared to the children who are living with their parents (15, 30). In a recent study, the mean PI (1.5±0.54) and GI scores (1±0.28) of the orphans were found to be higher than that of the control group (15). There was a statistically significant difference between the means of PI and GI scores of the participants who flossed when compared to those who do not ($p<0.05$). Although only 11 children claimed that they were using dental floss, this significance was probably due to the previous scaling and the use of mouth-rinses.

As far as the frequency of tooth brushing was concerned, the mean PI of the children who brush their teeth when they remembered were significantly higher than that of the group who claimed to brush every day ($p<0.05$). The children who brush their teeth occasionally when they remembered caused this lower level of oral hygiene. This result might be attributed to the inadequate brushing techniques

and brushing frequency, as well as the lack of close supervision (15, 26).

Conclusion

In order to improve their knowledge of oral health care, there is an apparent need for customized dental health care programs for children under state protection. In addition, dental hygiene practices should be monitored closely to maintain the level of oral health care, as good practice comes from adequate knowledge, which should be followed by an appropriate application of this knowledge. Furthermore, a positive attitude supported by supervision and reinforcement could significantly improve oral health and awareness may increase the quality of oral care and particularly, the frequency of brushing.

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Conflict of interest
None declared.

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