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Comparison of Oral and Dental Health of Children in Need of Special Care According to Disability Status

Özel Bakım İhtiyacı Olan Çocukların Engel Durumlarına Göre Ağız ve Diş Sağlığının Karşılaştırılması

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ÖZ

Amaç: Bu çalışmanın amacı, özel sağlık bakım gereksinimi olan çocuklar arasında ağız hijyeni, travma insidansı, DMFT, dmft, PUFA, pufa ve PUFA/pufa indeksini engel durumlarına göre karşılaştırmaktır.
Araçlar ve Yöntem: Bu kesitsel çalışmaya Elazığ ilinde özel eğitim kurumlarından 159 çocuk (ortalama yaş 9.5±4 yıl) dahil edildi. Muayenede çocukların yaşları, cinsiyetleri, engel durumları, diş çürüğü ve dental travma varlığı, diş aşınmaları, ağız hijyeni ve kooperasyon durumları kaydedildi. Diş çürükleri skorlaması için DMFT/dmft ve PUFA/pufa indeksleri kullanıldı. Veri analizi için 0.05 anlamlılık düzeyinde tek yönlü ANOVA ve Ki-kare testleri kullanıldı.
Bulgular: Travma insidansı, ağız hijyeni, DMFT/dmft, PUFA, pufa ve PUFA/pufa indekslerinde istatistiksel olarak anlamlı farklılıklar bulundu ($p<0.05$). En yüksek travma sahipliği Down sendromlu bireylerde görüldü ($p=0.001$). Ağız hijyeni kötü değerlendirmesinde en yüksek oran serebral palsili bireylerde bulundu ($p=0.043$). En yüksek DMFT indeksi fiziksel gerilik hastalarında, en düşük DMFT indeksi down sendromlu hastalarda görüldü ($p=0.001$). En yüksek dmft indeksi fiziksel gerilik hastalarında, en düşük dmft indeksi serebral palsili ve mental retarde hastalarda görüldü ($p=0.001$). En yüksek PUFA ve PUFA/pufa prevelansı fiziksel gerilik grubunda, en yüksek pufa prevelansı öğrenme güçlüğü grubunda görüldü ($p=0.001$).
Sonuç: Özel gereksinimli çocuklar, fiziksel ve zihinsel engelleri nedeniyle ağız ve diş sağlığı ile sıklıkla mücadele etmektedir. Bununla birlikte kooperasyonun yetersiz sağlandığı bu çocuklarda koruyucu diş hekimliği uygulamalarına ağırlık verilmesi gerektiğini düşünmekteyiz. Ayrıca bu bireylerde ağız ve diş sağlığı durumları engel türüne göre değişmektedir.

Anahtar Kelimeler: ağız hijyeni; DMFT; engelli çocuklar; özel sağlık bakım; PUFA

ABSTRACT

Purpose: This study aimed to compare oral hygiene, trauma incidence, DMFT, dmft, PUFA, pufa, and the PUFA/pufa index among children with special health care needs based on their disability status.
Materials and Methods: This cross-sectional study involved 159 children (mean age 9.5±4 years) from special education institutions in Elazig. Age, gender, disability, presence of dental caries, dental trauma, dental abrasions, oral hygiene and cooperation status of the children were recorded. DMFT/dmft and PUFA/pufa index were used for dental caries scoring. One-way ANOVA and Chi-square tests were used for data analysis with a significance level of 0.05.
Results: Statistically significant differences ($p<0.05$) were found in trauma incidence, oral hygiene, DMFT/dmft, PUFA, pufa, and PUFA/pufa indexes. The highest trauma incidence was in individuals with Down syndrome ($p=0.001$). Poor oral hygiene was most common in individuals with cerebral palsy ($p=0.043$). The highest DMFT index was in patients with physical retardation, and the lowest was in patients with Down syndrome ($p=0.001$). The highest dmft index was seen in patients with physical retardation, while the lowest was in patients with cerebral palsy and mental retardation ($p=0.001$). The physical retardation group had the highest PUFA and PUFA/pufa index, the learning disability group had the highest pufa index ($p=0.001$).
Conclusion: Children with special needs often struggle with oral and dental health due to physical and mental disabilities. However, we think preventive dentistry practices should be emphasized in these children where cooperation is inadequate. Oral and dental health varies according to disability type.

Keywords: disabled children**;** DMFT; oral hygiene; PUFA; special health care needs

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INTRODUCTION

Epidemiologic studies on oral and dental health aim to reveal the importance of dental health problems seen in societies.[1] In addition, the measures to be taken for dental health will play a role in emphasizing the importance and necessity of this issue and raising public awareness.[2] Disability in children is defined by the American Health Association as follows; "A child's inability to fully realize his/her physical, mental and social skills for various reasons; not being able to play, learn and do what his/her peers do". Special children in this situation are also called "children with special health care needs" because they routinely need lifelong support due to their physical, mental, sensory, behavioral, emotional and chronic medical conditions.[3]

According to the Turkish Statistical Institute (TURKSTAT) data published by the Prime Ministry Administration for Disabled People in 2011, 6.9% of the total population in Turkey consists of individuals with at least one disability. While disability is seen in 2.3% of the population in the 3-9 age group, it is seen in 2.1% in the 10-14 age group.[4]

In different studies, it has been observed that children with disabilities are more prone to oral hygiene-related gingival problems such as gingivitis and periodontitis than children without disabilities due to motor, sensory and intellectual disabilities.[5-9] In most of the studies on 'decayed, missing, and filled permanent teeth' (DMFT) and 'decayed, missing, and filled primary teeth' (dmft) indices of children with disabilities, it was observed that children with disabilities showed higher caries prevalence compared to healthy children.[7,10] Dental anxiety is high in children with special needs. For this reason, dental treatment planned to be performed may be difficult due to inadequate cooperation. One of the most important criteria affecting success in children who are planned to receive dental treatment is the patient's compliance with the treatment and children who cannot cooperate should be treated under deep sedation or general anesthesia.[5,11]

The aim of this epidemiologic study was to compare and evaluate the oral and dental health of children with special health care needs according to the type of disability and to determine the need for treatment.

The hypothesis of our study is that the oral and dental health status of children with special care needs does not change according to the type of disability.

MATERIALS and METHODS

Obtaining Ethical Approval Statement

This cross-sectional study was conducted in special education institutions. Our study was conducted with the approval of the Non-Interventional Research Ethics Committee of Fırat University (date: 29.12.2022 and number: 2022/16-18).

Study Design

The data for this study were conducted in schools providing special education to individuals with special health care needs and collected in accordance with research and publication ethics (159 participants). The mean age of the participants was 9.50±4.02 years. 72.3% of the participants were male and 27.7% were female. When analyzed according to disability status, 16.4% of the participants were diagnosed with Down syndrome, 8.2% with physical retardation, 10.1% with mental retardation, 33.3% with autism, 28.9% with learning disabilities, and 3.1% with cerebral palsy (Table 1). After obtaining consent from their families, children with special education needs were examined and these individuals, their families and teachers were informed about oral and dental care and their questions about oral and dental health were answered.

The basic criteria determined by the World Health Organization (WHO) used in determining the oral dental health level of the population are as follows: prevalence of caries experience, percentage of people with untreated caries, average number of teeth, average number of decayed and missing teeth, DMFT index, community periodontal index (CPI).[12]

In addition, PUFA/pufa indices were developed in 2010 to evaluate oral symptoms resulting from untreated dental caries.[13] The use of this index was also supported by the World Health Organization (WHO). In the 'Basic Methods

for Oral Health Research' guideline published by WHO in 2013, in addition to the previously developed form for children, it also recommends collecting data under the headings of lesions in the oral mucosa and the need for emergency intervention.[14]

Age, gender, disability status, presence of dental caries, dental trauma, tooth wear, oral hygiene and cooperation status of the children were recorded.

Oral hygiene was recorded by visually determining the amount of plaque on the buccal and lingual surfaces of the upper and lower anterior group teeth according to the index reported by James et al.[15] All individuals were included in the evaluation of oral hygiene regardless of age. A score of "0" was categorized as good oral hygiene, "1" as moderate and "2" as poor oral hygiene.[15] Oral hygiene scoring;

'0'; No plaque.

'1'; Small amounts of plaque accumulation and/or food debris at retention sites.

'2'; Plaque accumulation and/or food debris on most tooth surfaces.

When DMFT and dmft values were recorded, decayed, missing and filled teeth in deciduous teeth were evaluated in the 0-6 age group, decayed and filled teeth were included in the index in full in the 6-12 age group because of the mixed dentition period, and all decayed, missing and filled teeth were included in the index in the 12 years and older group.[16]

CPI probes were used for DMFT/dmft index and gingival health, while only mirror was used for PUFA/pufa index during intraoral examination. During the evaluation of the PUFA/pufa index, the debris on the tooth surface was removed with a cotton pellet without using any instrument and the proximity of the caries to the pulp was not checked by probing, but by inspection with the help of a mirror. It was calculated according to the following formula as suggested.[12,13]:

$$\frac{PUFA + pufa}{D + d}\ x100$$

P/p: Pulp-related caries will be recorded when the pulp chamber is visibly opened or the coronal tooth structure is completely lost due to caries and only the root and/or root fragments remain.

U/u: Ulceration, trauma to the soft tissues due to displacement of sharp edges and/or root fragments of teeth that have been severely damaged by caries.

F/f: Fistula is recorded when pus from a pulp-associated decayed tooth opens into the oral cavity via a fistula.

A/a: An abscess is recorded when there is a swelling with pus from a decayed tooth associated with the pulp.

D/d: indicates the number of decayed teeth. Capital letters indicate permanent dentition and lower case letters indicate deciduous dentition.

The dmft (deciduous teeth) and DMFT (permanent teeth) indices, which consist of (t-T) criteria obtained by dividing the total number of decayed (d-D), extracted (m-M) and filled (f-F) teeth by the number of people examined, were used to evaluate the health of the teeth.[12] Caries prevalence and oral hygiene status were determined with the data obtained.

In terms of the child's compliance, an individual who was examined easily without any help was classified as "well-cooperated", an individual who was examined in a short time with the help of a second person was classified as "moderately cooperated", and an individual who was examined with the help of a second person and even with the support of the parent for a long time was classified as "poorly cooperated".

Statistical Analysis

The aim of the study was to compare oral hygiene, DMFT and PUFA assessments with the diseases of 159 participants. Statistical comparisons were performed using the statistical program SPSS 23 (SPPS Inc, Chiago, IL, USA). The normality of the data distribution was analyzed by Kolmogorov Smirnov and Shapiro-Wilk tests. According

to the results obtained, it was determined that the measurements showed normal distribution. Statistical comparisons were performed with one-way Anova and chi-square tests. The statistical significance level was determined as $p<0.05$.

RESULTS

Demographic characteristics and disability distribution of the participants are shown in Table 1. The results of the participants' oral health evaluations are shown in Table 2.

Table 1. General demographics.

Variables	Mean	SD
Age	9.50	4.025
Gender	n	%
Boy	115	72.3
Girl	44	27.7
Disability	n	%
Down Syndrome	26	16.4
Physical Retardation	13	8.2
Mental Retardation	16	10.1
Autism	53	33.3
Learning Disabilities	46	28.9
Cerebral Palsy	5	3.1

SD: Standart deviation.

Table 2. Results of oral health evaluation.

Variables		n	%
Oral Hygiene	Good	53	33.3
	Moderate	64	40.3
	Poor	42	26.4
Abrasion	+	24	15.1
	-	135	84.9
Cooperation	well-cooperated	102	64.2
	moderately cooperated	17	10.7
	poorly cooperated	16	10.1
	non-cooperated	24	15
Trauma	+	21	13.2
	-	138	86.8

When the trauma evaluations of the participants according to their gender were examined; 12.2% of the males and 15.9% of the females were found to have trauma. It was determined that there was no statistically significant difference between these values (p=0.305) (Table 3).

There is a statistically significant difference between the presence of trauma according to the disability status of the participants (p=0.001). The highest rate of trauma ownership was 30.8% in participants with Down syndrome and the second highest rate was 25% in participants with mental retardation. None of the patients with physical retardation and cerebral palsy had trauma (Table 3).

Table 3. Trauma assessment by gender and disability status.

Variables		Travma		p
		Yes	No	
Gender	Boy	14 (12.2%)	101 (87.8%)	0.305
	Girl	7 (15.9%)	37 (84.1%)	
Disability	Down Syndrome	8 (30.8%)	18 (69.2%)	0.001
	Physical Retardation	0 (0.0%)	13 (100.0%)	
	Mental Retardation	4 (25.0%)	12 (75.0%)	
	Autism	3 (5.7%)	50 (94.3%)	
	Learning Disabilities	6 (13.0%)	40 (87.0%)	
	Cerebral Palsy	0 (0.0%)	5 (100.0%)	

There was a statistically significant difference in the dmft index according to the disability status of the participants (p=0.001). The highest dmft index was seen in patients with physical retardation and the lowest dmft index was seen in patients with cerebral palsy and mental retardation.

There was a statistically significant difference in DMFT indices according to the disability status of the participants (p=0.001). The highest DMFT index was seen in patients with physical retardation and the lowest DMFT index was seen in patients with Down syndrome (Table 4).

A statistically significant difference was found in the evaluation of PUFA prevalence according to the health status of the participants (p=0.001). The highest PUFA prevalence was 54% in the physical retardation group, while no PUFA prevalence was found in the cerebral palsy group (Table 4).

A statistically significant difference was found in the evaluation of pufa prevalence according to the health status of the participants (p=0.001). The highest pufa prevalence was found to be 51% in the learning disability group, while no pufa prevalence was found in the cerebral palsy group.

A statistically significant difference was found in the evaluation of PUFA/pufa prevalence according to the health status of the participants (p=0.001). The highest

PUFA/pufa prevalence was found to be 49% in the physical retardation group, while no PUFA prevalence was found in the cerebral palsy group (Table 4).

There is a statistically significant difference between the oral hygiene evaluations of the participants according to their disability ($p<0.05$). The highest rate of good oral hygiene evaluation was in participants with autism, with 41.5%, while the lowest rate was in participants with cerebral palsy, with 20%. The participants with the highest evaluation of poor oral hygiene were those with cerebral palsy with 40% and physical retardation with 38.5%. (Table 5)

Table 3. Trauma assessment by gender and disability status.

Variables		Travma		p
		Yes	No	
Gender	Boy	14 (12.2%)	101 (87.8%)	0.305
	Girl	7 (15.9%)	37 (84.1%)	
Disability	Down Syndrome	8 (30.8%)	18 (69.2%)	0.001
	Physical Retardation	0 (0.0%)	13 (100.0%)	
	Mental Retardation	4 (25.0%)	12 (75.0%)	
	Autism	3 (5.7%)	50 (94.3%)	
	Learning Disabilities	6 (13.0%)	40 (87.0%)	
	Cerebral Palsy	0 (0.0%)	5 (100.0%)	

Table 4. PUFA, pufa, PUFA/pufa prevalence, DMFT and dmft scores by disability status.

Variables		PUFA	pufa	PUFA/pufa	dmft	DMFT
Disability	Down Syndrome	28.57 [a]	35.18 [a]	31.88 [a]	4.43±1.67[a]	1.27±0.46[a]
	Physical Retardation	54.54 [b]	45.23 [b]	49.89 [b]	6.67±2.18[b]	2.27±1.07[b]
	Mental Retardation	36 [c]	33.33 [a]	34.65 [a]	1.75±0.80[c]	1.92±1.10[b]
	Autism	23.81 [a]	46.15 [b]	34.98 [a]	3.42±1.42[a]	1.67±0.88[a]
	Learning Disabilities	39.28 [c]	51.85 [b]	45.56 [b]	3.64±1.25[a]	1.45±0.79[a]
	Cerebral Palsy	0.0 [d]	0.0 [c]	0.0 [c]	1.80±1.03[c]	1.50±0.86[a]
	p	0.001	0.001	0.001	0.001	

Upper letters are used for comparison. There is no difference between groups with the same letter.

Table 5. Oral hygiene evaluation according to disability status.

Variables		Oral Hygiene			p
		Good	Moderate	Poor	
Disability	Down Syndrome	8 (30.8%)	12 (46.2%)	6 (23.1%)	0.043
	Physical Retardation	4 (30.8%)	4 (30.8%)	5 (38.5%)	
	Mental Retardation	6 (37.5%)	6 (37.5%)	4 (25.0%)	
	Autism	22 (41.5%)	19 (35.9%)	12 (22.6%)	
	Learning Disabilities	12 (26.1%)	21 (45.7%)	13 (28.3%)	
	Cerebral Palsy	1 (20.0%)	2 (40.0%)	2 (40.0%)	

DISCUSSION

According to the results of our study, a statistically significant difference was found between the groups in the evaluations of trauma incidence, oral hygiene, DMFT/dmft index, PUFA, pufa and PUFA/pufa indices according to the type of disability of the participants ($p<0.05$). Thus, our hypothesis that oral and dental health values of children with special care needs do not change according to the type of disability was partially rejected.

People with disabilities have many oral health problems. The most important of these problems are high number of dental caries, tooth loss due to caries, periodontal diseases, abrasions on teeth due to bruxism, tooth fractures due to trauma and malocclusion.[17] Children with disabilities cannot provide a good oral hygiene due to inadequacy in motor functions and mental deficiencies.[7,18]

In a study on oral and dental health of children with disabilities, the percentage of good oral health was found to be 11.8, while the percentage of moderate oral health was 50.5 and poor oral health was 37.7.[18] In our study, in oral

hygiene evaluations, individuals with good oral hygiene were found to be 33.3%, moderate oral hygiene to be 40.3 and poor oral hygiene to be 26.4%. In a study conducted it was found that the types of disability affected the degree of oral hygiene in a statistically significant way. Among the participants, autistic children had the highest oral hygiene score and children with cerebral palsy had the lowest oral hygiene score.[17] In our study, children with autism with 41.5% had good oral hygiene scores and children with cerebral palsy with 40.0% had poor oral hygiene scores, supporting the results of this study. Another study found that children with autism had the highest oral hygiene and children with mental retardation had the poorest oral hygiene in their study.[19]

In previous studies, the prevalence of dental trauma was found to be 58.6% in healthy children.[20] In children with special care needs, the rate was 9.2%.[21] In a study, they found no statistically significant difference between boys and girls in terms of dental trauma rates ($p>0.05$). They also showed that there was no statistically significant relationship between the frequency of dental trauma and the type of disability ($p>0.05$). In this study, the frequency of dental trauma was found to be 14% in children with autism and 20% in children with Down syndrome. 21.62% dental trauma was found mostly in individuals with intellectual disabilities.[22] However, in our study, there was a statistically significant difference in terms of dental trauma according to disability status ($p=0.001$). There was no statistically significant difference between girls and boys for dental trauma. The highest trauma rate was 30.8% in participants with Down syndrome, followed by participants with mental retardation at 25%. No trauma was found in patients with physical retardation and cerebral palsy.

Studies on DMFT and dmft values of children with disabilities have shown a higher caries prevalence in disabled children compared to healthy children. On the other hand, there are also studies reporting that there is no difference between disabled and healthy children in terms of caries incidence.[7,8,10,23] The reasons for the differences observed between disabled and healthy children in terms of caries prevalence include differences in carbohydrate intake frequency, differences in salivary flow rate, impaired cooperation, lack of hygiene due to muscle and joint problems and chewing difficulties.[23]

In a study conducted in the 0-6 age group, the highest DMFT value was observed in the cerebral palsy group. In the 6-12 age group, the highest DMFT value was observed in children with Down syndrome and in children with mental retardation in the permanent dentition period.[16] In a different study, no statistically significant difference was found between DMFT and dmft scores of participants with autism, mental retardation and Down syndrome ($p>0.05$).[22] In our study, there was a statistically significant difference between the dmft and DMFT scores according to disability status between the groups ($p=0.001$). The highest dmft score was observed in the physical retardation group. The lowest dmft score was observed in the cerebral palsy and mental retardation groups. The highest DMFT index was seen in patients with physical retardation and the lowest DMFT score was seen in patients with Down syndrome. In one study, pediatric patients with Down syndrome had a higher incidence of gingivitis, while the incidence of caries was similar or lower than in the normal population. The reason for this was related to the fact that IgA, which was found at a higher rate in the saliva of children with Down syndrome compared to normal children, increased resistance to caries.[24]

In previous studies on these indices, while there are studies on healthy children aged 5-12 years,[13,25-27] there are not many studies on children with special education needs. In our study, a statistically significant difference was found in the evaluation of PUFA, PUFA and PUFA/pufa prevalence according to disability status. The highest PUFA prevalence was found in the physical retardation group (54%) and the lowest PUFA prevalence was found in the autism group (23%). The highest PUFA prevalence was found in the learning disability group (51%) and the lowest PUFA prevalence was found in the mental retardation group (33%). The highest PUFA/pufa prevalence was seen in the physical retardation group (49%) and the lowest PUFA/pufa prevalence was seen in the Down syndrome group (31%). PUFA, PUFA, PUFA/pufa prevalence was not observed in the cerebral palsy group.

Conclusion

Children with special health care cannot have a good oral and dental health because they cannot provide oral care due to their physical and mental deficiencies. This leads to many problems such as excessive number of dental caries and gingival problems. In order to prevent these problems, periodic oral and dental examinations should be carried out for these individuals and, if necessary, it should be ensured that they perform their oral care well with the help of an assistant.

Conflict of Interest

The authors declare that there is not any conflict of interest regarding the publication of this manuscript.

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Ethics Committee Permission

The study was approved by the Non-Interventional Research Ethics Committee of Fırat University (date: 29.12.2022 and number: 2022/16-18).

Authors' Contributions

Concept/Design: ŞY. Data Collection and/or Processing: ŞY, BT. Data analysis and interpretation: ŞY, BT. Literature Search: BT. Drafting manuscript: ŞY, BT. Critical revision of manuscript: ŞY. Supervision: ŞY.

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