

# Evaluation of Changes in Quality of Life After Dental Treatment in Children

## Çocuklarda Diş Çürüğü Tedavisi Sonrası Yaşam Kalitesindeki Değişimlerin Değerlendirilmesi

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### Abstract

**Objective:** Various instruments can be used in children to determine the impact of Oral Health Related Quality of Life (OHRQoL). Child Perceptions Questionnaire (CPQ<sub>8-10</sub>) can be used to evaluate the oral symptoms, functional limitations, emotional well-being and social well-being of subjects. Our study aimed at evaluating the impact of dental caries on OHRQoL and the changes in quality of life of subjects after treatment of dental caries compared to subjects without dental caries using CPQ<sub>8-10</sub>.

**Materials and Methods:** Study included a total of 200 systemically healthy subjects aged 8-10 years (110 girls, 90 boys; 9.10±0.8) who referred to Adnan Menderes University Pediatric Dentistry clinic between June 2016 and May 2017. Based on the results of clinical and radiological examination, two groups were created consisting of subjects with (n=100, 9.14±0.81) and without (n=100, 9.05±0.82) dental caries and treatment needs, and CPQ<sub>8-10</sub> questionnaire was used to evaluate the quality of life. Questionnaire was repeated 4 weeks after the completion of treatment of subjects with dental caries. Results were subjected to statistical evaluation.

**Results:** Pre-treatment CPQ<sub>8-10</sub> scores of subjects with dental caries were higher than those of subjects without dental caries (17.46±11.66 and 6.86±4.76, respectively; p<0.001) OHRQoL scores were decreased after dental treatment (4.06±5.40) and the difference was statistically significant (p<0.001). CPQ<sub>8-10</sub> scores after dental treatment were lower than those of subjects without dental caries who did not need treatment (p<0.001).

**Conclusion:** We have determined that the untreated dental caries negatively affect the quality of life in children aged 8-10 years, and the quality of life substantially improves after treatment of dental caries.

### Keywords

Quality of life, dental caries, CPQ<sub>8-10</sub>

### Anahtar Kelimeler

Yaşam kalitesi, diş çürüğü, CPQ<sub>8-10</sub>

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### Öz

**Amaç:** Ağız sağlığının yaşam kalitesi üzerine etkisinin Oral Health Related Quality of Life (OHRQoL) belirlenmesi için çocuklarda farklı ölçekler uygulanabilmektedir. "Çocuk Algıları Ölçeği" [Child Perceptions Questionnaire" (CPQ<sub>8-10</sub>)] ile gönüllülerin ağız içi semptomları, fonksiyonel kısıtlılıkları, duygusal problemleri ve sosyal etkiler değerlendirilebilmektedir. Çalışmamızda diş çürüğünün OHRQoL üzerine etkisinin değerlendirilmesi, diş çürüklerinin tedavisi sonrasında yaşam kalitesindeki değişimlerinin CPQ<sub>8-10</sub> ile diş çürüğü olmayan gönüllülerle karşılaştırılması amaçlanmıştır.

**Gereç ve Yöntemler:** Adnan Menderes Üniversitesi Diş Hekimliği Pedodonti Kliniği'ne, Haziran 2016-Mayıs 2017 tarihleri arasında başvuran 8-10 yaş arasındaki

sistemik olarak sağlıklı 200 gönüllü (110 kız, 90 erkek,  $9,10\pm 0,8$ ) çalışmaya dahil edilmiştir. Klinik ve radyolojik muayene sonucunda, diş çürüğü ve tedavi ihtiyacı olan ( $n=100, 9,14\pm 0,81$ ) ve diş çürüğü ve tedavi ihtiyacı olmayanlardan ( $n=100, 9,05\pm 0,82$ ) oluşan iki grup oluşturulmuş ve yaşam kalitesinin değerlendirilmesinde CPQ<sub>8-10</sub> anketi uygulanmıştır. Diş çürüğü olan gönüllülerin, tedavilerinin tamamlanmasından 4 hafta sonra anket tekrarlanmıştır. Sonuçlar istatistiksel olarak değerlendirilmiştir.

**Bulgular:** Diş çürüğü bulunan gönüllülerin tedavi öncesi CPQ<sub>8-10</sub> skorları ( $17,46\pm 11,66$ ) diş çürüğü olmayanlara ( $6,86\pm 4,76$ ) göre daha yüksek bulunmuştur ( $p<0,001$ ). Diş tedavileri sonrasında, yaşam kalitesi skorları ( $4,06\pm 5,40$ ) düşüş göstermiştir ve bu fark istatistiksel olarak anlamlıdır. ( $p<0,001$ ). Diş tedavisi sonrasındaki CPQ<sub>8-10</sub> skorları, tedavi ihtiyacı olmayan çürüksüz gönüllülerden daha düşük olarak tespit edilmiştir ( $p<0,001$ ).

**Sonuç:** Sekiz-on yaş aralığındaki çocuklarda tedavi edilmemiş diş çürüğünün yaşam kalitesini olumsuz yönde etkilediği ve diş çürüklerinin tedavi edilmesi sonrasında yaşam kalitesinin önemli derecede arttığı belirlenmiştir.

## Introduction

Oral and dental health problems may cause negative effects on functional, social and psychological status of children. Evaluation of impact of oral and dental health on quality of life of children can improve the communication between patients, parents and dentists. In addition, evaluation of Oral Health-Related Quality of Life (OHRQoL) may be helpful in assessing the treatment needs, setting the priorities and assessing the outcomes of treatment strategies and initiatives (1).

Assessments have been conducted in recent years to investigate the impacts of dental caries, traumatic dental injuries, gingival diseases and malocclusions on quality of life in children (2-4). Various questionnaires and scales have been used to conduct such assessments. Early Childhood Oral Health Impact Scale (ECOHIS) is a method that is applied to children aged 2-5 years and responded by the parents (5). Oral Impact on Daily Performance scale evaluates the impacts of oral and dental health on daily activities (6). Child Perceptions Questionnaire (CPQ), which was also used in our study, was developed by Jokovic et al. (7) in 2004. This questionnaire can be applied to two different age groups of 8-10 years and 11-14 years. CPQ questionnaires, which contain questions that evaluate the functional, emotional, social and oral symptoms, have been adapted to many languages and found to be successful in determining OHRQoL (8-11).

Studies performed using CPQ<sub>8-10</sub> questionnaire have shown that the dental caries negatively affect the quality of life in children (12,13). The aim of our study was to determine if treatment of dental caries eliminated such negative effects, using CPQ<sub>8-10</sub> questionnaire.

## Materials and Methods

Our study was conducted at Adnan Menderes University Faculty of Dentistry. Ethics committee's approval was obtained (Adnan Menderes University, Faculty of Medicine, Non-Interventional Ethics Committee/2016-876) before initiation of the study. The CPQ<sub>8-10</sub> was used to evaluate OHRQoL in both groups. Questionnaire consisted of 25 questions including 5 questions for oral symptoms, 5 questions for functional, 5 questions for emotional and 10 questions for social status. Questions were directly asked to children and they were asked to respond the questions as "never", "a few times", "sometimes", "often" and "almost every day". Responses were scored between 0 and 4 according to 5-point Likert scale. Besides these 25 questions, the following 2 questions were also asked to children to obtain a general evaluation about their oral health: "What do you think about your mouth and teeth?" and "How often do you feel uncomfortable with your mouth and teeth?" (Questions 26 and 27). Study included 200 children aged 8-10 years who referred to pediatric dentistry clinic for examination between June 2016 and May 2017. Three calibrated dentists carried out the dental examinations. Based on the results of clinical and radiological examination, two groups were created consisting of subjects with dental caries who have no pain last 4 week, have no need radicular pulpal treatments and only need restorative dental treatment ( $n=100$ ) and without ( $n=100$ ) dental caries, and CPQ<sub>8-10</sub> was used to evaluate the quality of life. Age, gender, health insurance status and income levels were also recorded in addition to questions evaluating the quality of life. Status of dental caries was reported as decayed, missing and filled teeth (DMFT)/dft, decayed-missing-filled surfaces (DMFS)/dfs in consequence of clinical examination.

Following the completion of clinical examination and questionnaire, treatment of patients with dental caries was initiated by a single specialist (MD). Oral hygiene training were given to patients after completion of preventive treatments and asked to return to clinic for control visit 4 weeks for repeating the questionnaire by two different specialist (KUGG and IS). All patients included were informed about the study.

### Statistical Analysis

Data of group of healthy subjects and pre and post-treatment data of patients with dental caries were recorded and statistically evaluated by IBM SPSS Statistics 21.0 program (Armonk, NY, USA). Results were evaluated using chi-square test, Mann-Whitney U and Kruskal-Wallis tests.

### Results

Records of 110 girls and 90 boys included in two groups consisting of subjects with (n=100, age=9.14±0.81 year) and without (n=100, age=9.05±0.82 year) dental caries and treatment needs were evaluated. No statistically significant relationship was found between the age, gender, social insurance status and the OHRQoL; however, OHRQoL was observed to increase with the increase in income level and a statistically significant relationship was found (p=0.017) (Table 1). In group of patients with dental

caries, mean DMFT/dft and mean DMFS/dfs values were calculated to be 2.51±1.99 ve 3.62±2.53 and 3.62±3.39 ve 7.39±5.97, respectively.

CPQ<sub>8-10</sub> values of groups caries free and dental caries pretreatment and post-treatment were found to be 6.86±4.76, 17.46±11.66 and 4.06±5.4, respectively (Table 2). When the responses to Questions 26 and 27 were evaluated, the mean values were determined to be 1.64±0.905, 1.08±0.849 and 1.82±0.657 and 1.31±0.961, 1.71±0.891 and 43±0.537, respectively in caries free, dental caries pretreatment and post-treatment subjects (Table 3).

### Discussion

Most of the current OHRQoL instruments could manage to measure the impact of oral health on physical, functional, social and emotional well-being of a person. As in adults, oral and dental health disorders can affect diet, health and quality of life in children (14). Results of our study also showed that the oral and dental health affect quality of life. A significant difference was observed between the OHRQoL values of caries free children and children with dental caries, and dental caries were determined to negatively affect the quality of life. According to results of our study, quality of life is not affected by age, gender and health insurance status.

**Table 1. Distribution of age, gender, income level and health insurance in groups**

	Caries free subjects (n)	Subjects with dental caries (n)	Total	Rate (%)
Age				
8	31	27	58	29.0
9	33	32	65	32.5
10	36	41	77	38.5
Gender				
Girls	55	55	110	55.0
Boys	45	45	90	45.0
Income level				
TRY <1.000	13	22	35	17.5
TRY 1.000-2.999	48	60	108	54.0
TRY 3.000-5.999	25	14	39	19.5
TRY >6.000	14	4	18	9.0
Health insurance				
Yes	95	94	189	94.5
No	5	6	11	5.5

**Table 2. Study groups and oral health related quality of life values (p<0.001)**

	Caries free	Dental caries pretreatment	Dental caries Post-treatment
Oral symptoms (Questions 1-5)	2.50±2.24b	5.75±2.88c	0.91±1.34a
Functional limitations (Questions 6-10)	1.31±1.60b	4.08±3.50c	0.89±1.33a
Emotional well-being (Questions 11-15)	1.89±2.31b	4.59±4.64b	1.13±2.25a
Social well-being (Questions 16-25)	1.15±1.88a	3.17±4.56b	1.17±2.32a
Total (Questions 1-25)	6.86±4.76b	17.46±11.66c	4.06±5.40a

a,b,c: A statistically significant differences is shown with the letter a, b, c in the same column

**Table 3. Responses to questions 26 and 27 and mean values by groups**

	Caries free	Dental caries pre-treatment	Dental caries post-treatment
Question 26	1.64±0.90b	1.08±0.84a	1.82±0.65c
Question 27	1.31±0.96b	1.71±0.89c	0.43±0.53a

a,b,c: A statistically significant differences is shown with the letter a, b, c in the same column

Children of parents with higher education and family income levels are likely to have a better quality of life. It has been shown that lower education level causes decreased income (15) and the low income level is associated with poverty (16). Children from poor families have limited access to healthcare services and preventive interventions that avoid poor quality of life (17). Results of our study indicated a significant relationship between family income level and quality of life. Children from families with higher income level were observed to have a superior quality of life.

Untreated dental caries in children can cause difficulties in chewing, sleeping and socializing, and affect self-confidence, growth and weight gain, thereby decreasing quality of life (18). Such effect of dental caries has given rise to investigations into whether dental treatments could improve the quality of life again. In recent years, investigators evaluated pre- and post-treatment quality of life of children given dental treatment under general anaesthesia using ECOHIS scale, and reported that dental treatment positively affected the quality of life (19-21). These studies were usually conducted in patients aged 6 years and below. In a study conducted in an older age group by administering treatment under clinical conditions, CPQ<sub>8-10</sub> questionnaire was applied to a total of 186

children divided into 2 groups as healthy children and children with dental caries. Questionnaire was repeated 4 weeks after the completion of treatment in patients who needed treatment. Based on the results of study, it was concluded that the treatment of dental caries positively affected the quality of life (22). These results are consistent with the results of our study.

#### Study Limitations

Our study showed that the post-treatment OHRQoL values were significantly higher compared to group of healthy subjects. This difference might be associated with the resolution of pre-treatment symptoms such as pain and dental fear and the reduction of anxiety.

Orthodontic problems are also known to affect quality of life. Healey et al. (23) evaluated the relationship between malocclusion and the quality of life using CPQ<sub>11-14</sub> questionnaire and reported a significant relationship between them. Orthodontic evaluations were not conducted in subjects with and without dental caries in our study, and the patients presented to our clinic with orthodontic problems were asked to complete the questionnaire without receiving orthodontic treatment. This might have affected the OHRQoL values and can be considered as a limitation of our study.

As another limitation, the relationship between treatment type and the quality of life could not be evaluated in our study. More traumatic procedures like tooth extraction and the number of such procedures are believed to increase the possibility of problems such as post-treatment eating difficulty in children (24). On the other hand we did not evaluate the validity of CPQ<sub>8-10</sub> in Turkish children. During the development and evaluation of the CPQ for 8- to 10-year-olds, questions were selected from the CPQ<sub>11-14</sub> (7). The translation and validation of CPQ<sub>11-14</sub> version into Turkish was carried out by Aydogan (25). The CPQ<sub>8-10</sub> was used to evaluate OHRQoL in both groups. We approved the validation of CPQ<sub>11-14</sub> version into Turkish children for assessing the 8-10 years old. Further studies are needed to development of the CPQ<sub>8-10</sub> in Turkish children for more accurate estimation.

## Conclusion

Our study has shown that the quality of life of 8 to 10-years-old children with dental caries that need to be treated is negatively affected compared to children without dental caries and treatment needs, and the quality of life is significantly improved after treatment. Thus, it appears that the dental treatments are likely to improve the quality of life in children.

## Ethics

**Ethics Committee Approval:** Adnan Menderes University Faculty of Medicine, Non-Interventional Ethics Committee, (approval number: 2016-876).

**Informed Consent:** All patients included were informed about the study.

**Peer-review:** Externally peer-reviewed.

## Authorship Contributions

Surgical and Medical Practices: K.G.U.G., M.D., Concept: K.G.U.G., I.S., Design: K.G.U.G., I.S., Data Collection or Processing: K.G.U.G., M.D., Analysis or Interpretation: K.G.U.G., M.D., Literature Search: K.G.U.G., M.D., Writing: K.G.U.G., M.D., I.S.

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

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