



THE EXAMINATION OF RELATIONSHIP BETWEEN ORTHODONTIC TREATMENT NEED AND QUALITY OF LIFE IN TURKISH CHILDREN

TÜRK ÇOCUKLARINDA ORTODONTİK TEDAVİ İHTİYACI VE YAŞAM KALİTESİ ARASINDAKİ İLİŞKİNİN İNCELENMESİ

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SUMMARY

Objective: The aim of this research is to examine the associated with between orthodontic treatment need and quality of life (QoL) in Turkish children and to stress the association of this relation with some variables such as sociodemographic (age, gender, social class) factors, the level of orthodontic treatment need, frequency of visiting a dentist and treatment will.

Material and Methods: Study group was consisted of 178 children who were between ages of 11 and 14, and had orthodontic treatment need. Control group was consisted of 100 children who had no or negligible orthodontic problems. Dental Health Component (DHC) of Index of Orthodontic Treatment Need (IOTN) was based to establish the orthodontic treatment need of every individual. To determine the effect of this need on QoL, shortened 16 items version Child Perception Questionnaire (CPQ₁₁₋₁₄) and Child-Oral Impact of Daily Performance (Child-OIDP) index were used.

Results: The results reveal that the averages of total QoL in study group is statistically significant lower than the control group for both questionnaires ($p < 0.05$). Significantly lower QoL averages were experienced in CPQ₁₁₋₁₄ questionnaires only in emotional and social well being domains, and in Child OIDP questionnaire only in smiling, emotional stability and social contact domains when compared control groups with study groups ($p < 0.05$). Besides, statistically significant differences were determined in answers to the questions regarding the frequency of visiting a dentist and treatment will ($p < 0.05$).

Conclusion: The orthodontic treatment need significantly affects the QoL of school children in Erzurum, Turkey. However; this situation is associated with not the physical activities but with psychological activities of the child. It can be argued that the sub-titles such as oral symptoms and functional limitations of quality of life surveys with regard to oral health are not associated with orthodontics patients.

ÖZET

Amaç: Bu araştırmanın amacı Türk çocuklarında yaşam kalitesi (QoL) ile ortodontik tedavi ihtiyacı arasındaki ilişkiyi incelemek ve bu ilişkinin sosyodemografik faktörler (yaş, cinsiyet, sosyal sınıf), ortodontik tedavi ihtiyacı seviyesi, diş hekimi ziyaret sıklığı ve tedavi isteği ile olan ilişkisini vurgulamaktır.

Materyal ve Metot: Çalışma grubu ortodontik tedaviye ihtiyaç duyan ve yaşları 11 ile 14 arasında değişen 178 çocuktan, kontrol grubu ise ortodontik problemi olmayan ya da ihmal edilebilecek seviyede ortodontik problem yaşayan 100 çocuktan oluşmaktaydı. Her bireyin ortodontik tedavi ihtiyacını belirlemek için Ortodontik Tedavi İhtiyacı İndeksinin (IOTN) Diş Sağlığı Bileşeni (DHC) esas alındı. Yaşam kalitesi üzerine bu ihtiyacın etkisini belirlemek için kısaltılmış 16 maddelik CPQ₁₁₋₁₄ anketi ve Child-OIDP indexi kullanıldı.

Bulgular: Mevcut araştırmanın sonuçlarına göre çalışma grubundaki total yaşam kalitesi ortalamaları her iki ankette de kontrol grubundan istatistiksel olarak anlamlı şekilde daha düşüktür ($p < 0.05$). Kontrol grubu ile karşılaştırıldığında çalışma grubunda istatistiksel olarak anlamlı daha düşük yaşam kalitesi ortalamaları CPQ₁₁₋₁₄ anketinde sadece emasyonel ve sosyal iyilik alanlarında; Child OIDP anketinde ise yalnızca gülümseme, emasyonel stabilite ve sosyal iletişim başlıkları altında tespit edilmiştir ($p < 0.05$). Bunun yanında tedavi isteği ve diş hekimi ziyaret sıklığı sorularına verilen cevaplara bağlı oluşan yaşam kalitesi ortalamalarında da anlamlı farklılıklar belirlenmiştir ($p < 0.05$).

Sonuç: Ortodontik tedavi ihtiyacı Türkiye'nin Erzurum ilindeki okul çağı çocuklarında yaşam kalitesini anlamlı şekilde etkilemektedir. Bununla birlikte bu etki fiziksel değil sadece psikolojik aktiviteler ile ilgilidir. Bu noktadan hareketle kullanılan oral sağlıkla ilişkili yaşam kalitesi anketlerinin oral semptomlar ve fonksiyonel limitasyonlar gibi alt başlıklarının ortodonti hastaları ile alakalı olmadığı da düşünülebilir.

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INTRODUCTION

Oral health related quality of life (OHRQoL) has been defined as the absence of negative impacts of oral conditions on social life and a positive sense of dentofacial self confidence.¹ There is an increasing recognition that oral health has a significant impact on physical, social and psychological well-being.² In other words, it is a known fact that whilst the majority of oral diseases are not fatal, they give rise to significant morbidity, resulting in physical, social and psychological consequences which affect patient's quality of life (QoL).³ Traditional measures of oral health ignore the perceptions and feelings of the person and effect of their mouth on them. Besides this, patient perceptions are important in the assessment of treatment need, planning of appropriate therapy and clinical outcome.⁴

While QoL measures are relatively common in medical research, similar research in dentistry is underdeveloped. However, although enhancement of QoL is frequently stated as a reason for undertaking orthodontic treatment, there is still relatively little evidence for this in the literature. At the same time, in underdeveloped and developing countries such as Turkey, the relationship between orthodontic treatment need and QoL is largely unexplored. Considering this point, this research is the first study in this area in our country.

The aims of this research;

-to examine the relation between of orthodontic treatment need and QoL in Turkish children with CPQ₁₁₋₁₄ and Child-OIDP questionnaire

-to define the effect of this relation with the sociodemographic factors (age, gender, social class), orthodontic treatment need level, the frequency of visiting a dentist and treatment will.

MATERIAL AND METHODS

Sample

Current study was commenced on 302 patients between the ages 11-14 who applied to Atatürk University Oral Diagnosis and Radiology. The need level for orthodontics treatment was determined by an academic from the Department of Orthodontics (F.K.). He used DHC (dental health component) of IOTN (index of orthodontic treatment need).⁵ The patients

in our study group were grade 2 (little need), Grade 3 (borderline need), Grade 4 and 5 (very need). The control group were grade 1 (no need) or extremely minor malocclusions including contact point displacements less than 1 mm. Additionally, they had DMFT \leq 2 and no history of orthodontic treatment. Patients were not included in the study who gave insufficient data. Consequently, the study was implemented on 278 patients, one of which is the study group consisting of 178 patients and control group consisting of 100 patients.

Demographic information: Age, sex, and socioeconomic status (social class of the family is here defined by the income of the head of the family in combination with his/her level of education. Within this classification system, 6 social classes were distinguished. For the purpose of the statistical analysis, these were reduced to two categories: high social class and low social class).

Data Collection

For this research, shortened 16 items version of Child Perception Questionnaire (CPQ₁₁₋₁₄) and Child-Oral Impact of Daily performance (Child-OIDP) questionnaire were used. The CPQ₁₁₋₁₄ (36 item) which was developed by Jokovic *et al*⁶ to be used for 11 to 14-years-olds with a wide range of dental, oral, and orofacial disorders (oral symptoms, functional limitations, emotional well-being, social well-being) was applied. A 16-item short form of CPQ₁₁₋₁₄ was developed by the same research team to facilitate administration of the questionnaire in clinical settings.⁷ For children a 3-month reference period reduces recall bias compared with the 6-month period used by some adult measures. The Child-OIDP index appropriate for children to aid assessment of need in child population was developed in Thailand.⁸ This index is suitable for 11- to 12-year-olds and is administered as an interview. It allows for the calculation of condition specific impacts that attribute impacts to specific oral conditions such as malocclusion, oral deformity, traumatic dental injury, and enamel defects. It includes 8 performances: eating, speaking, cleaning sleeping, smiling, emotional stability, school work, social contact. The questionnaires were translated into Turkish in accordance with cross-cultural adaptation guidelines to produce Turkish version of the CPQ₁₁₋₁₄ and the Child-OIDP. For CPQ₁₁₋₁₄ (RSF: 16) each item

was scored: (0) never; (1) once/twice; (2) sometimes; (3) often; and (4) everyday/almost every day. Possible CPQ₁₁₋₁₄ scores range from 0 to 64, with higher scores indicating poorer oral health related quality of life (OHRQoL). For the Child-OIDP the response categories were (1) severe; (2) moderate; (3) little; (4) very little; (5) no impact. Possible Child-OIDP scores range from 8 to 40, with lower scores indicating poorer OHRQoL. As seen, the high score in CPQ₁₁₋₁₄ questionnaire coincide with low score Child-OIDP questionnaire. To prevent this situation formulated as (5) never; (4) once-twice; (3) sometimes; (2) often; (1) everyday/almost everyday in CPQ₁₁₋₁₄ questionnaire. In this way the high score in both questionnaires was provided better OHRQoL.

Following questions were tried to be figured out.

How often a child visits a dentist? Good (always), Moderate (sometimes), Poor (rarely)

Do you think your teeth need straightening?
Yes or No

Data Analysis

Data analysis was carried out on a personnel computer using the statistical Package for Social Sciences software for Windows version 10.0. Scores were derived from both questionnaires by summing the responses to each of the individual questions within the measures. T-test was used to compare questionnaires. $P < 0.05$ was considered statistically significant.

RESULTS

The study included 278 patients between the ages 11-14, 178 of whom are (88 male and 90 female) in the study group, the rest of whom are in the control group (50 male, 50 female). While in the study group, the number of the children from high and low social class groups were close to each other (88/90); high social class in the control group was higher than the low social class (80/20). Similarly, the frequency of visiting a dentist in the study group was low for many of the children (86.5%), but this situation was observed in %20 of the children in the control group. Age, sex, IOTN grades, social class and visiting dentist of control and study group were presented in Table 1.

Table 1. Sociodemographical distribution of the patients

	Study population		Control population	
	n	%	n	%
Gender				
Female	90	50.6	50	50.0
Male	88	49.4	50	50.0
Age				
11	42	23.6	25	25.0
12	26	14.6	25	25.0
13	54	30.3	25	25.0
14	56	31.5	25	25.0
Social class				
High	88	49.4	80	80.0
Low	90	50.6	20	20.0
DHC				
Grade 1 no need	-	-	100	100.0
Grade 2 little need	43	24.2	-	-
Grade 3 borderline need	45	25.3	-	-
Grade 4-5 very need	90	51.5	-	-
Visiting of dentist				
Good always	9	5.1	20	20.0
Moderate sometimes	15	8.4	52	52.0
Poor rarely	154	86.5	28	28.0

The averages of the answers by the study and control group to the questionnaires are presented in Tables 2 and 3. The difference between the amounts of the total QoL among the study and control groups was found to be statistically important for both questionnaires ($p < 0.05$).

The relation of the gender, age, DHC grade, visiting a dentist, social class, and treatment will to the total QoL of the patients in the study group for both questionnaires was shown in Table 4. In both questionnaires, the QoL averages of the female were found to be lower than those of the male, as the age got older the QoL averages increased. However, the differences were not found to be significant ($p > 0.05$). The QoL averages depending upon socioeconomic level were found to be closed one another ($p > 0.05$). The differences between DHC grade related QoL averages were unimportant ($p > 0.05$). The variables revealing the notable differences on the averages QoL in our study were visiting a dentist and treatment will. This notable difference was only seen in Child-OIDP questionnaire.

Table 2. Comparative analysis of CPQ₁₁₋₁₄ life quality rates in study and control group

CPQ ₁₁₋₁₄	Study population	Control population	P value
Oral symptom (mean±sd)	4.33±0.63	4.40±0.32	P>0.05
Functional limitation (mean±sd)	4.56±0.64	4.68±0.17	P>0.05
Emotional well being (mean±sd)	3.51±1.20	4.98±0.08	0.004
Social well being (mean±sd)	4.21±0.89	5.00±0.00	0.02
Total (mean±sd)	4.05±0.61	4.81±0.75	0.03

Table 3. Comparative analysis of life Child-OIDP quality rates in study and control group

Child-OIDP	Study population	Control population	P value
Eating (mean±sd)	4.23±1.11	4.50±0.68	p>0.05
Speaking (mean±sd)	4.22±1.22	4.34±0.92	p>0.05
Cleaning (mean±sd)	4.87±1.39	4.80±0.61	p>0.05
Sleeping (mean±sd)	4.71±0.88	4.74±0.53	p>0.05
Smiling (mean±sd)	3.52±1.57	4.30±1.02	0.02
Emotional stability (mean±sd)	4.15±1.22	4.70±0.46	0.04
School work (mean±sd)	4.94±0.27	5.00±0.00	p>0.05
Social contact (mean±sd)	4.40±1.16	5.00±0.00	0.04
Total (mean±sd)	4.20±0.80	4.88±0.13	0.04

Table 4-Comparative analysis of the effects of sociodemographical factors, level of the orthodontic treatment need, frequency of dental visit and treatment will on quality of life in patients of the study group.

	n	CPQ ₁₁₋₁₄ (mean±sd)	p value	ChildOIDP (mean±sd)	p value
Gender					
Female	90	3.97±0.54	0.12	4.14±0.79	0.79
Male	88	4.13±0.67		4.27±0.81	
Age					
11	42	4.21±0.37	0.95	4.40±0.70	0.58
12	24	4.16±0.49		4.41±0.78	
13	54	3.99±0.75		4.14±0.81	
14	56	3.93±0.64		4.02±0.80	
Social class					
High	88	4.09±0.62	0.57	4.19±0.92	0.10
Low	90	4.00±0.61		4.22±0.67	
DHC					
Grade 2 little need	43	3.88±0.53	0.78	3.90±0.86	0.12
Grade 3 borderline need	45	4.17±0.61		4.38±0.74	
Grade 4-5 very need	90	4.07±0.64		4.26±0.77	
Visit dentist					
Good always	9	3.98±0.29	0.40	4.54±0.45	0.04
Moderate sometimes	15	3.85±1.01		3.73±1.05	
Poor rarely	154	4.07±0.57		4.23±0.78	
Dou you think your teeth need straightening?					
Yes	140	3.97±0.61	0.84	4.10±0.83	0.03
No	38	4.33±0.52		4.58±0.56	

DISCUSSION

The study of QoL and orthodontics is further complicated by the fact that children and adolescents have very different concepts of QoL when compared with adults. It is widely acknowledged that a child's own concepts of QoL change with age; hence, it is often difficult to separate changes due to normal development from those due to orthodontic

intervention. Another challenge is cognitive development; not only the children must understand the questions, but they must also have the ability to grade their response in relation to a specific scale. Even the relevance and meaning of questions can differ between children of similar ages, and changes in individual children over time pose particular problems for studies involving repeated measurements.⁹ Additionally, the majority of measures developed in the field of dentistry are not applicable to orthodontic patients, primarily because most orthodontic conditions are asymptomatic and relate to aesthetic rather than features such as pain or discomfort.⁸ This means that research into outcomes of orthodontic treatment has tended to concentrate on traditional indices and measurements.

It is generally considered that the patient benefits psychologically from the orthodontic treatment with improved facial and dental appearance, and self-confidence increases accordingly.¹⁰ As a part of facial structure, the dentition plays an important role in facial appearance because people are frequently concerned with dental arrangement, alignment, and appearance. Additionally, malocclusion can impact on the overall facial appearance.¹¹ Moreover, some patients who have a severe malocclusion, the greater the embarrassment felt by individual.¹² Longitudinal study has suggested that malocclusion may adversely affect self-concept not only during adolescence, but also in adulthood.¹³

Ironically, milder deviations in tooth position tend to evoke ridicule and teasing, whereas severe deformities elicit strong emotional reactions such as pity or revulsion. A meta-analysis on the social effects of bullying associated with malocclusion has suggested that victims are often socially isolated and suffer psychological problems including anxiety and depression.¹⁴

Marques *et al*¹⁵ observed that female sex, normative need for treatment considered elective and highly desirable, and intermediate economic level such as variable are risk factors for an esthetic impact and there was no significant difference between esthetic impact and age. In the research of O'Brien *et al*¹⁶ reported that CPQ₁₁₋₁₄ scores were higher for girls, for higher grades of the DHC, and for children who thought that their teeth needed straightening, and the scores were unrelated to socioeconomic status. Bernabe *et al*¹⁷ stated education level was the only demographic variable that significantly affected the prevalence of self-perceived malocclusion and intensity of the impacts associated with self-perceived malocclusion. de Oliveira and Sheiham¹⁰ determined both the OHRQoL measure (OIDP and OHIP-14) used were significantly associated with the normative orthodontic treatment need measure, namely the dental health component of the IOTN index. In a quality of life research¹⁸ which has been conducted Japanese orthodontic patients, while the association between age and adolescent's oral health impact was significance; the association between social class and oral health impact was not significant. When we examined the effects of the age, gender, IOTN grades, social grades, and visiting a dentist on the average QoL in both questionnaires we saw that this effect was different in both of them. In CPQ₁₁₋₁₄ questionnaire, this effect for each variable was statistically unimportant ($p > 0.05$). However in Child-OIDP questionnaire it was determined that there was a notable difference between the answers of visiting a dentist and treatment will question (do you think your teeth need straightening?) and the average of QoL ($p < 0.05$). According to Child-OIDP questionnaire in the patients with high frequency of visiting a dentist total QoL rate was higher, in other words, their QoL was better. According to the same questionnaire, in the patients who gave a negative (no) answer to the

question "do you think your teeth need straightening?" the average of QoL was considerably higher than the ones answering positive (yes). This may be with respect to the ignorance of the current situation by the child, or may be related with the thought of greater aesthetic destruction for him stemming from orthodontic treatment. At the end of these, the averages of higher QoL were determined by expressing the pleasure of resulting from his present.

CONCLUSION

This is the only research in our country to examine the effect of orthodontic treatment need on the QoL. In this context, these two questionnaires appeared as reliable for examining the QoL in the area of orthodontics. Additionally, the results affected not only psychosocial activities of the children with orthodontic need, but also the physical activities. The sub-titles such as oral symptoms and functional limitations of quality of life surveys with regard to oral health were not associated with orthodontics patients. As observed in this research, the relationship of this effect with the variables, such as gender, age, DHC grades, visiting a dentist, treatment will, and social class can be different according to the statistical method or the kind of questionnaire.

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