Volume 04, Issue 04 (July-August 2021), PP 06-21 **www.ijmsdr.org**
ISSN: 2581-902X

International Journal of Medical Science and Dental Research

Child Perceptions Questionnaire 8-10:Validity and Reliability Of Turkish Version

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Abstract

Background/Aim: *Evaluation of the oral health related quality of life(QoL) of children along with dental examination is critical to reveal the consequences of dental problems. The Child Perceptions Questionnaire(CPQ) is one of the scales used for evaluating the QoL of children. It was aimed to develop the Turkish version of CPQ_{8-10}(T-CPQ_{8-10}) and to evaluate the psychometric properties of this version.* ***Methods:*** *The CPQ_{8-10} was translated, a pilot-study assessed comprehensibility, and scale's adaptation was completed. The data was collected with T-CPQ_{8-10}. Dental examination was performed. Confirmatory-factor-analysis for construct validity, item analysis, item-discrimination-index for discriminant validity, and Cronbach-Alpha-internal consistency-coefficient for reliability were calculated.* ***Results:*** *Totally 213 children (108 females,105 males) with a mean age of 9.38±0.75 participated. The mean CPQ_{8-10} was 15.31±10.82, Cronbach's alpha for the total scale was 0.871. Items were statistically discriminant and significant. The total and sub-scales were statistically-significantly related. CPQ_{8-10} scores and global ratings were positively correlated (<0.001).* ***Conclusions:*** *T-CPQ_{8-10} had good internal consistency reliability of subscales and was valid in healthy 8-10-year-old-children. Our findings underline the value of considering how oral conditions affect children's daily functioning. Besides, supports the importance of not only evaluating the dental health, but also QoL for a comprehensive oral health evaluation.*

Keywords - *children, oral health, quality of life, reliability, validity*

I. INTRODUCTION

Oral health is a frequently evaluated part of general health for effects on quality of life (QoL). Oral health-related quality of life (OHRQoL) reflects individuals' self-perception of their present oral health status and its effect on their QoL [1]. Dental problems and some treatment experiences may affect the QoL [2-6]; dental caries is one of the leading causes that negatively affecting child's own and their families' QoL [7]. Dental caries might cause pain-related irregular sleep, school absenteeism and decreased school success, limitation of speech, difficulty in chewing resulting with tooth loss, aesthetic and self-confidence problems; in brief, physical, physiological and social problems. The more the number of affected or lost teeth, the more significant the negative impact on the child's life [8].

Increased interest in evaluating oral conditions on QoL led to the creation of evaluation instruments. Children's views on their quality of life should not be neglected, and these views should be respected. In the steps for increasing the QoL of children, the ideas and feelings of themselves must be considered. So, children deserve their own, separate measurement methods from adults. A series of questionnaires (Child Oral Health Quality of Life-COHQoL) is one of the most commonly used to assess children and adolescents' QoL related to oral and orofacial disorders. It consists of 3 main questionnaire groups that aim to measure the perceptions of children (CPQ) [9, 10], perceptions of parents/caregivers (P-CPQ) [11], and the impact of children's oral health on family life (FIS) [12]. Children fill in Child Perceptions Questionnaires, and it is divided into three groups according to ages; 5-7, 8-10, and 11-14. CPQ for ages 8 to 10 (CPQ_{8-10}) consists of 4 subscales (oral symptoms, functional limitations, emotional well-being, social well-being), a total of 25 questions [9]. The CPQ might help assess the oral health of individuals and populations in epidemiological researches, make clinical decisions, and evaluate dental interventions, services, and programs [9]. In the literature, there are studies about translation or validation of CPQ_{8-10} in different languages [13-21]. However, the Turkish version of CPQ_{8-10} (T-CPQ_{8-10}) could not be found in the literature, which formed after the developers' necessary permissions.

The CPQ_{8-10} is a frequently used scale for evaluating the child's oral health quality of life. Consequences of the dental problems, which a great burden, on quality of life of school children with their own-report is significant. I In light of this knowledge, this study aims to develop the T-CPQ_{8-10} and to evaluate the psychometric properties of this version.

II. METHODOLOGY

2.1. Study design and Ethics statement

The local ethics committee approved this methodological study of X University, Ankara, Turkey (Approval number: 2020/05-15). The necessary permission was obtained from the researchers who developed the original "Child Perception Questionnaire (CPQ_{8-10})" in written form (by e-mail). The research protocol was explained to the children and their parents/caregivers, and their written consent was obtained to participate in the research.

2.2. Participants

Children aged between 8-10-years-old and Turkish speaking who applied to the pediatric dental clinic (Gölbaşı Oral Dental Health Center) were included in the study between February-March 2020. Children with any mental disability or admitted to the clinic for advanced signs of infection such as dental trauma or cellulitis were excluded from the study. Totally 200-250 children were planned to be involved depending on the number of items in the scale, calculating the 8-10 times of 25 items of the original scale [22].

2.3. Translation and Adaptation of the Questionnaire

The translation procedure followed was a forward and backward translation process. The Turkish translation of the scale items was initially accomplished by three translators and reviewed by three pediatric dental specialists. Afterward, the re-translation of the agreed Turkish translation was made by two translators whose native language was English (bilingual speakers), and the translations were compared with the original scale. Then, the agreed English translation was translated back into Turkish by two independent people. During the cross-cultural adaptation of the translated version, the word "steak" which could be translated in the Turkish language as "biftek" into "et" was changed on a question in original question number seven that "have you had a hard time biting or chewing food like apples, corn on the cob or steak, because of your teeth or mouth?"; which is more suitable for the nutritional habits of children in Turkey, and more comprehensive to them. The penultimate agreed version was subjected to a pilot study of 30 children not included in the final sample group to discuss the suitability of the items and determine the comprehensibility problems. The participants were informed about the purpose of the pilot study and asked to report the questions they had difficulty understanding and comment on the understandability of the scale. According to the pilot study results, the questionnaire was

organized by the committee, the cultural adaptation was completed, and the final version of the Turkish- CPQ_{8-10} was obtained. The adaptation process was summarized in Figure 1.

2.4. Data Collection

Data was collected after the ethical approval, and all formal permissions were completed in the first quarter of 2020. In the first part of data collection, a standardized questionnaire form, that comprises socio-demographic information and information about the child's oral hygiene habits was used, filled out by a pediatric dentist with a face-to-face interview method. After that, as a second part of the data collection, the children completed the Turkish version of CPQ_{8-10} (Appendix 1). Finally, the dental examination of the children was performed by a pediatric dentist in the dental clinic under the unit light according to the WHO guidelines [23].

CPQ_{8-10} questionnaire, which consists of 25 questions and four subscales, was used. In this questionnaire, oral symptoms in the first subscale (5 questions), functional limitations in the second subscale (5 questions), emotional well-being in the third part (5 questions), and social well-being in the fourth part (10 questions) were questioned.[9] For all questions, the frequency of the events in the previous four weeks concerning the child's oral/orofacial condition was evaluated. The responses were scored as a five-point Likert scale (never: 0, once/twice: 1, sometimes: 2, often: 3, every day/almost every day: 4). A total score and subscale scores were calculated by summing up all scores; the higher score pointed higher effect on the quality of life, indicating worse child OHQoL. Besides these 25 questions, the instrument also contains global ratings of the child's oral health and the extent to which the oral/orofacial condition affected his/her overall well-being. These were "When you think about your teeth or mouth, would you say that they are…" and "How much do your teeth or mouth bother you in your everyday life?" A 4-point response format, ranging from "very good"=0 to "poor"=3 (very good, good, fair, poor) and from "not at all"=0 to "a lot"=3 (not at all, a little bit, some, a lot), respectively, was offered for these ratings.

For dental examination, dmft(s) and DMFT(S) index system [23] which expressing the total number of teeth or surfaces with caries, fillings, and extraction as a result of caries and pufa, PUFA index system [24] which is used for revealing the clinical consequences of untreated dental caries with four components; the presence of pulpal involvement (p/P), ulceration (u/U), fistula (f/F) and abscess (a/A) were used. All lower cases were for primary teeth, while upper cases were indices used for permanent teeth.

2.5. Statistical analysis

Frequencies and percentages for categorical variables; mean, standard deviation, median, and IQR for continuous were given. Confirmatory factor analysis for construct validity; item analysis and item discrimination index, known as the lower-upper 27% group and seen the difference of each item in lower-upper 27% group computed on 116 observations for discriminant validity and the Cronbach Alpha internal consistency coefficient for reliability measurement, were calculated. As a result of the confirmatory factor analysis, standardized coefficient estimates and model fit indices were obtained. The estimation method was a maximum likelihood. Statistical analysis was performed by using SPSS Version 22.0 and SPSS AMOS 22. The differences of groups in subscales and total scores were tested by t and F tests, and different groups were determined by Bonferonni test. The significance level was 0.05.

III. RESULTS

In this study, a totally of 213 participants were involved; of the children 108 (50.7%) were female. The mean age of participated children was 9.38 ±0.75 (min:8- max: 10 years-old). Almost one in fourth (n=53, 24.9%) of children had not regular brushing habit (Table 1). The descriptive statistics of dmft (4.93±3.38), dmfs (12.47±9.65), DMFT (1.61±1.95), DMFS (2.32±2.95), pufa (1.25±1.51), PUFA (.03±.20) indices were obtained.

Analyzes for the global ratings of the child's oral health and extension to which the oral/orofacial condition affected his/her overall well-being were reported in details in Tables 1 and 2. $CPQ_{8–10}$ scores and global ratings were positively correlated (<0.001). Self-perceived ratings of oral health are shown in Table 2. Significant correlations ranged from .398 to .590 were detected between the global rating of oral health and all subscales. In oral symptoms, "fair" and "Poor" responses were statistically significantly differed to "very good" and "good" (p values were <0.001, .003 and .002, .019, respectively). In functional limitations, there were statistically significant differences between "fair" and "very good" (p=.007), poor and other categories (p values were for very good <.001, good <.001, fair .003 respectively). In emotional, social well-being, and total, there was a statistically significant difference between poor and other categories (p-value was <.001 for all). The mean (±sd.) score for the question "When you think about your teeth or mouth, would you say that they are…" was 1.51±1.00.

The analysis of self-perceived ratings of the influence of the oral conditions on daily life is shown in Table 2. Significant correlations ranged from .203 to .405 were detected between overall well-being and all subscales in this study. In oral symptoms, "not at all" and other categories were differed statistically (p-value was <.001 for all), and "sometimes" and "a lot" were differed to "a bit" (p<.003). In functional limitations, "some" and "a lot" responses were statistically significantly differed to "not at all" and "a little bit" (p<.003 in all situations). In emotional well-being and total, "sometimes" and "a lot" responses were statistically significantly differed to "not at all" and "a bit" (p<.008 for all). In social well-being, "a lot" and other categories were statistically significantly differed (p<.001). The mean (±sd.) score for the question "How much do your teeth or mouth bother you in your everyday life?" was 1.01±1.06.

In Table 3, Cronbach's alpha values for the subscales are shown, ranging from 0.67 to 0.86. These statistics indicated good internal consistency reliability of subscales. In item analysis, items were consistent. According to the item discriminant index, items were discriminate in the lower-upper 27% group and significance as statistically. Also, standardize estimates obtained confirmatory factor analysis were statistically significant (p<0.05). The mean CPQ_{8-10} score of the children was 15.29 ± 10.82. Cronbach's alpha for the total scale was 0.871. Construct validity was approved in this path. The result of confirmatory factor analysis was well-fitted. Fit indices obtained by model could accept (CMIN/df=2.669, RMR=0.064, GFI=0.801, RMSEA=0.089, SRMR = .0898). Three pairs of item results (11-12, 14-15, and 22-23) showed that children had similar perceptions. The modification was done between Item 11 and 12, 22 and 23, 14 and 15; respectively. In Table 4, correlation coefficients of total and subscale scores were shown by Spearman's correlation and Structural Equation Modelling. The relationship between total and sub-scales were found statistically significant. As a result, construct validity was proven.

The mean CPQ_{8-10} dimension scores to dmft, dmfs, DMFT, DMFS and pufa, PUFA categories did not show a statistically significant difference except for functional limitations and pufa (Table 5).

IV. DISCUSSION

In the quality-of-life studies, it is essential to use measurement tools for gathering a globally understandable result. When instrument is used in a new context or with a different group of individuals, it is necessary to re-establish its psychometric properties[1]. In this study, CPQ_{8-10} had been translated and Turkish version of the scale was evaluated; which that showed the psychometric properties of the T-CPQ_{8-10} were suitable among this target group. In the industrialized countries school children have been faced with dental caries as a great burden. Although the quality of life is a subjective perception, parents are frequently used as informants on children's health. However, parents' perception of their children's OHRQoL is not accurate enough to detect oral health problems and they had limited knowledge[25, 26]. On that sense, the consequences of caries on quality of life of school children with their own-report is significant. Besides, 8-10 years-old children are the primary school aged children elder than the first year of school in which the reading and writing is learnt, making easy to self-report the QoL. This study was planned for these aged children with dental caries.

In this study, except the 25-questions instrument, the self-reported ratings of the child's oral health and influence of the oral conditions on daily life were also evaluated with the questions as "when you think about your teeth or mouth, would you say that they are…" and "how much do your teeth or mouth bother you in your everyday life?" (Overall well-being). Significant correlations ranged from 0.20 to 0.59 were detected between global ratings of oral health and overall well-being and all subscales, indicating that children are able to give psychometrically acceptable accounts concerning their health status and its overall effects on their lives[27]. Total correlations between $CPQ_{8–10}$ scores and global ratings of oral health and overall well-being were 0.59 and 0.41, respectively. Correlations in the literature for other languages were reported as: 0.45-0.45 in Danish[13], 0.38–0.39 in Brazilian[14], 0.37–0.32 in Korean[16] versions for oral health and overall well-being, respectively. Our results were in agreement with the Danish[13], Brazilian[14], Korean[16] versions of the $CPQ_{8–10}$ which revealed significant associations between global ratings. It was expected that children who rated their overall health and oral health status as poor/a lot bothered would have higher scores. The analysis confirmed that higher $CPQ_{8–10}$ overall scores and subscale scores for each of the four domains were associated with poorer self-perceived oral and general health. This was similar with the original scale except for the overall correlation and the correlation between the functional limitations and social well-being scores. The study showed that the CPQ scores of oral symptoms were higher than other subscale scores; which might be caused by children's familiarity with oral symptoms like loose primary teeth in that age group.

For reliability, internal consistency was evaluated with Cronbach's alpha. For the reliable scale, items need to be corelated with each other for items addressing the same concept are actually doing so[28]; it was checked for four sub-scales and the overall scale. The Cronbach's α were 0.693, 0.667, 0.855 and 0.849 for oral symptoms, functional limitation, emotional well-being and social well-being, respectively; which showed the subscales were reliable in the acceptance of values higher than 0.60 shows a reliable scale[22]. Emotional well-being sub-scale items were the most consistent among sub-scales, which is in parallel with the original scale reliability test result[9]. Besides, the oral symptoms domain had the highest mean values in sub-scales; that may be caused by dental caries make difficulty in biting, chewing and similar oral functions as it was predicted. In comparison to other studies concerning Cronbach alpha values of subscales, were not so different: 0.63–0.89 in original Canadian[9], 0.57–0.78 in Danish,[13] 0.67–0.92 in Brazilian[14], 0.71-0.86 in Mexican[15], 0.57–0.77 in Korean[16], 0.78–0.92 in Arabic[17], 0.58-0.86 in German[18] and 0.65–0.88 in Australian[20] 0.74-0.78 in French versions[21]. Total Cronbach's α was 0.87 that showed a highly internal consistency reflecting reliability. This value in the reported studies were as: 0.89 in Canadian[9], 0.82 in Danish[13], 0.95 in Brazilian[14] , 0.89 Mexican[15] , 0.85 in Korean[16], 0.95 in Arabic[17], 0.88 in German[18], 0.81 in French versions[21].

For construct validity, the result of confirmatory factor analysis was evaluated. The estimates and fit indices of the confirmatory factor analyses was approved in acceptable level.

The $CPQ_{8–10}$ has been previously tested conventionally in different clinical samples of children with dental caries, clefts of the lip and/or the palate and malocclusions[9, 13, 22]. In this study, the subscale scores and total score were indifferent in statistically significance according to the DMFT, DMFS and dmft, dmfs groups. For $CPQ_{8–10}$, between the caries experience and CPQ_{8-10} a positive association in Canadian[9], Brazilian (only primary tooth)[14], Mexican[15], Korean[16], Arabic[17], German[18] and Australian[20] versions. These differences were stated possibly caused by that the deciduous untreated dental caries among children 8 to 10 could progress to become painful, but that dental caries on permanent teeth may not be so severe for children aged 8 to 10 years to influence their OHRQOL.

Concerning dental caries experience and consequences of untreated dental caries, it was hypothesized that children with more severe caries and with more "pufa or PUFA" signs would have higher impacts on their QoL. However, only primary dentition showed statistically significant difference in functional limitation sub-scale. This predicted result is caused due to the process of untreated dental caries lesions' progress to become painful and distressing. When the children were categorized according to decayed, missing or filled tooth in primary or permanent dentition as at least 1 or not at all (dmft=0 and DMFT=0), it was seen only ten children

had healthy teeth. This very low number might be caused due to the children were gathered from the clinical appliers, which is frequently related with a problem in our country. Children with dmft index score zero were 24 (11.3%), while DMFT index score zero were 98(46.0%). Analysis within DMFT was not statistically significant but also provided some evidence to suggest that the $CPQ_{8–10}$ scores were associated with the severity of this clinical condition in an expected direction. In the age 8-10 when thought the eruption times of the teeth, 54.0% of the children had at least 1 DMF tooth; which is need to be considered. Besides, children's experiences like dental eruption during the mixed-dentition period might be related to physiological processes and affect the OHRQoL[14]. Our findings underline the value of considering how dental conditions affect children's daily functioning.

V. CONCLUSION

In conclusion, Turkish version of CPQ_{8-10} was translated from English to Turkish, culturally adapted and tested for reliability and validation. T-CPQ_{8-10} had a good internal consistency and reliability of subscales. Testing in a sample of children revealed that T-CPQ_{8-10} seem to be a valid instrument for measuring OHQoL in healthy children.

Clinical relevance

Scientific rationale of the paper: Evaluation of the OHRQoL of children along with dental examination is critical to reveal the consequences of dental problems. In the steps for increasing the QoL of children, the ideas and feelings of themselves must be taken into consideration.

Principal findings: Turkish version of CPQ_{8-10} is a valid instrument for measuring OHQoL in healthy children 8-10 years old.

Practical implications: Our findings underline the value of considering how oral conditions affect children's daily functioning. Besides, supports the importance of not only evaluating the dental health, but also quality of life for a comprehensive oral health evaluation.

Limitations of the study: For reliability, although it was planned to do a test-retest for the one in four of the children, it could not be completed due to the disturbance of the patient examination/treatment in dental clinics in the COVID-19 pandemic, which was occurred in the mid of the study. Further, CPQ_{8-10} component of COHQoL measurement scales was tested in clinical setting with systemically healthy children with/without caries, but it would be valuable to test the measures sensitivity with respect to specific oral childhood conditions (such as in a group of children with traumatic dental injuries, orthodontic problems, and etc.) or special health care needed groups. Therefore, further researches in different groups are required.

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Tables

Table 1. Some characteristics of children

Characteristics	n (213)	% (100.0)
Gender		
Female	108	50.7
Male	105	49.3
Regular tooth brushing		
No	41	19.3
Yes	172	80.7
Frequency of brushing		
Never	1	0.5
Rarely	40	18.8
Once a day, at night	76	35.7
Once a day, in the morning/midday	26	12.2
Twice a day or more times a day	70	32.8
Dental visit history		
No	16	7.5
Yes	197	92.5
When you think about your teeth or mouth, would you say that they are…		
Very good	50	23.5
Good	34	16.0
O.K.	99	46.5
Poor	30	14.1
How much do your teeth or mouth bother you in your everyday life?		
Not at all	85	39.9
A little bit	73	34.3
Some	22	10.3
A lot	33	15.5

Table 2. Mean, standard deviation and differences of self-perceived ratings of oral health and influence of oral conditions on daily life to $CPQ_{8–10}$ scores

	Answers for the questions (mean ± sd)				**F (p value)**	**r (p value)**
	When you think about your teeth or mouth, would you say that they are…					
	Very good[a]	**Good[b]**	**OK[c]**	**Poor[d]**		
Oral Symptoms	4.60 ± 3.48	5.52 ± 3.12	7.45 ±3.39[b,a]	8.05 ± 3.11[b,a]	9.353 (<0.001)	.475 (<0.001)
Functional	1.83 ± 2.60	2.91 ± 3.56	3.96 ± 2.97[a]	6.57 ±3.25[a,b,c]	10. 955	.452

Limitations					(<0.001)	(<0.001)
Emotional Well-being	1.83 ± 2.81	2.05 ± 2.74	2.45 ± 3.56	7.10 ±5.56[a,b,c]	12.334 (<0.001)	.398 (<0.001)
Social Well-being	.53 ± .82	1.88 ± 3.42	2.05 ± 3.77	7.52 ±6.18[a,b,c]	16.296 (<0.001)	.406 (<0.001)
Overall scale	8.80 ± 6.75	12.36 ± 8.25	15.95 ±9.88[a]	29.24 ± 13.44[a,b,c]	21.648 (<0.001)	.590 (<0.001)
	How much do your teeth or mouth bother you in your everyday life?					
	Not at all[a]	**A little bit[b]**	**Some[c]**	**A lot[d]**		
Oral Symptoms	2.19 ± 2.38	5.24 ± 3.34[a]	7.57 ± 2.94[a,b]	8.08 ± 3.17[a,b]	28.047 (<0.001)	.333 (<0.001)
Functional Limitations	1.08 ± 1.67	2.06 ± 2.66	4.17 ± 3.25 [a,b]	5.76 ± 3.52 [a,b]	14.488 (<0.001)	.398 (<0.001)
Emotional Well-being	0.65 ± 1.09	0.68 ± 1.57	3.14 ± 3.72 [a,b]	5.48 ± 5.45 [a,b,c]	12.590 (<0.001)	.203 (0.003)
Social Well-being	0.31 ± .55	0.62 ± 1.56	2.37 ± 3.62	6.56 ± 7.08 [a,b,c]	15.426 (<0.001)	.290 (<0.001)
Overall scale	4.23 ± 4.04	8.59 ± 6.18	17.25 ± 8.38 [a,b]	26.46 ± 16.04 [a,b,c]	34.410 (<0.001)	.405 (<0.001)

[a,b,c,d] *The categories with the same letters were differentiated statistically significant.*

Table 3. The results of item analysis, confirmatory factor analysis, reliability and descriptive statistics according to subscales

Scale domains	Item Analysis					Item Discrimination Index		Standartized Estimates
	Mean ± sd	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	t	p	
Oral symptoms[a]								
Pain in the teeth or mouth	1.38±0.938	5.22	8.708	.476	.634	-5.463	<.001	.545
Sore spots in the mouth	0.89±0.94	5.71	9.205	.374	.673	-6.176	<.001	.438
Pain in the teeth when drinking cold drinks or eating foods	1.25±1.024	5.35	8.398	.468	.635	-9.327	<.001	.559
Food stuck in the teeth	1.65±1.10	4.9	8.115	.456	.640	-	<.001	.592

	8	5				9.390		
Food stuck in the teeth	1.42±1.186	5.18	7.685	.476	.633	-9.274	<.001	.646
General	6.60± 3.50	min=0, max=16, median =7, IQR=5, Cronbach Alfa =0.693						
Functional Limitations[b]								
Needed longer time than others to eat the meal	0.9±1.079	2.74	7.617	.386	.633	-6.914	<.001	.540
Had a hard time biting or chewing food like apples. corn on the cob or steak	1.05±1.087	2.59	6.554	.601	.523	-9.917	<.001	.685
Had trouble eating foods that would like to eat	0.9±1.197	2.75	6.879	.441	.610	-6.208	<.001	.544
Had trouble saying some words	0.37±0.828	3.28	8.569	.376	.637	-5.515	<.001	.498
Had a problem sleeping at night	0.43±0.836	3.22	8.783	.322	.656	-6.162	<.001	.466
General	3.64 ±3.33	min=0, max=15, median =3, IQR=5, Cronbach Alfa = .667						
Emotional well-being[c]								
Been upset	0.75±1.01	1.97	9.801	.560	.855	-9.978	<.001	.530
Felt frustrated	0.46±0.914	2.25	9.652	.683	.822	-7.607	<.001	.682
Been shy	0.45±0.892	2.27	9.565	.725	.812	-6.383	<.001	.853
Been concerned what other people think	0.52±0.955	2.20	9.093	.757	.801	-7.255	<.001	.802
Worried about not as good-looking as others	0.54±0.988	2.18	9.518	.635	.834	-7.807	<.001	.723
General	2.72 ± 3.79	min=0, max=18, median =1, IQR=4, Cronbach Alfa = .855						
Social well-being[d]								
Missed school	0.3±0.674	2.03	13.947	.532	.837	-5.665	<.001	.594
Had a hard time doing homework	0.23±0.603	2.10	13.695	.676	.824	-5.197	<.001	.722

Had a hard time paying attention in school	0.29±0.714	2.04	13.496	.586	.832	-4.661	<.001	.637
Not wanted to speak or read out loud in class	0.25±0.645	2.08	13.653	.631	.828	-5.367	<.001	.686
Tried not to smile or laugh when with other children	0.34±0.823	1.99	14.152	.363	.859	-5.569	<.001	.453
Not wanted to talk to other children	0.22±0.601	2.11	13.841	.643	.827	-5.444	<.001	.692
Not wanted to be with other children	0.16±0.526	2.17	14.284	.634	.830	-4.209	<.001	.650
Stayed away from activities like sports and clubs	0.15±0.568	2.18	14.189	.599	.831	-3.727	<.001	.627
Other children teased you or called you names	0.14±0.491	2.19	14.706	.566	.835	-4.318	<.001	.625
Other children asked questions	0.26±0.634	2.08	14.743	.407	.847	-4.744	<.001	.449
General	2.33±4.12	min=0, max=21, median =0, IQR=2, Cronbach Alfa = .849						
Overall scale[e]	15.31±10.82	min=0, max=56, median =14, IQR=13, Cronbach Alfa = .871						

Number of items: [a]*:5;* [b]*:5;* [c]*:5;* [d]*:10;* [e]*:25*
Range of possible values: [a]*:0-20;* [b]*:0-20;* [c]*:0-20;* [d]*:0-40;* [e]*:0-100*

Ranges: [a]*:0-16;* [b]*:0-15;* [c]*:0-18;* [d]*:0-21;* [e]*:0-56*

Table 4. Correlation coefficient of total and subscale scores

	OS	FL	EW	SW
Total scale	.748	.740	.700	.668
Subscales				
Oral Symptoms	-	.562	.318	.257
Functional Limitations	.760	-	.292	.357
Emotional Well-being	.309	.338	-	.560
Social Well-being	.323	.442	.560	-

* The diagonal up elements are Spearman's correlation coefficient and the diagonal down elements are structural model correlation coefficients in measurement error model.

OS: Oral symptoms, FL: Functional limitations, EW: Emotional well-being, SW: Social well-being

Table 5. The mean and standard deviation of CPQ_{8-10}dimension scores according to dental index categories

Subscales	**Dental indices**											
	dmft		**DMFS**		**dmfs**		**DMFT**		**pufa**		**PUFA**	
	0[a]	1[b]	0[a]	1[b]	0[a]	1[b]	0[a]	1[b]	0[a]	1[b]	0[a]	1[b]
Oral Symptoms	6.83 ± 3.37	6.57 ± 3.52	6.67 ± 3.74	6.54 ± 3.28	7.00 ± 3.40	6.55 ± 3.51	6.72 ± 3.77	6.50 ± 3.25	6.09 ± 3.64	6.99 ± 3.35	6.62 ± 3.48	5.83 ± 4.17
Functional Limitations	3.30 ± 3.23	3.68 ± 3.35	3.33 ± 3.40	3.91 ± 3.26	3.46 ± 3.24	3.67 ± 3.35	3.39 ± 3.43	3.86 ± 3.24	3.11 ± 3.18	4.05 ± 3.40*	3.63 ± 3.33	4.17 ± 3.66
Emotional Well-being	3.87 ± 4.36	2.58 ± 3.70	2.24 ± 3.20	3.13 ± 4.21	3.79 ± 4.28	2.58 ± 3.71	2.27 ± 3.21	3.10 ± 4.20	2.79 ± 3.57	2.66 ±3.96	2.70 ± 3.79	3.33 ± 3.93
Social Well-being	1.83 ± 2.99	2.39 ± 4.24	2.15 ± 4.09	2.48 ± 4.17	2.08 ± 3.19	2.36 ± 4.23	2.18 ± 4.12	2.45 ± 4.14	1.97 ± 3.46	2.60 ± 4.56	2.32 ± 4.15	2.67 ± 3.20
Overall scale	15.83 ± 9.96	15.24 ± 10.94	14.39 ± 10.80	16.11 ± 10.82	16.33 ± 10.05	15.18 ± 10.93	14.56 ± 10.90	15.95 ± 10.76	13.96 ± 10.04	16.34 ± 11.31	15.29 ±10.79	16.00 ± 13.02

[a] *Dental index category as absent;* [b] *Dental index category as exist*

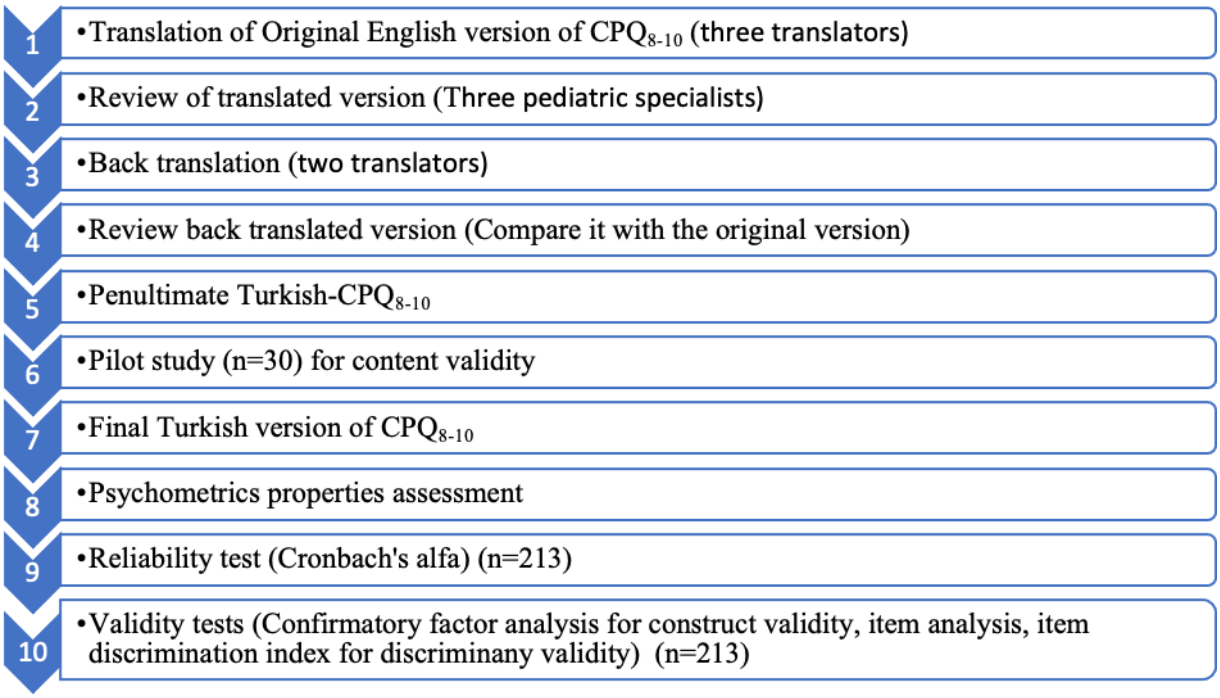

Figure 1. The adaptation process of the scale's validity and reliability

Appendix 1. Turkish-CPQ$_{8-10}$ questionnaire form

Çocuk Algı Anketi

Son 4 haftada, ne sıklıkta...

	Hiç	1-2 kez	Ara sıra	Sıklıkla
1. Dişlerinizde ya da ağzınızda ağrı hissettiniz?				
2. Ağzınızın içinde yara oluştu?				
3. Yemek yerken ya da soğuk bir şey içerken dişlerinizde ağrı hissetiniz?				
4. Dişleriniz arasında yemek kaldı?				
5. Nefesiniz kötü koktu?				
6. Dişleriniz ya da ağzınızdan dolayı yemeğinizi başkalarından daha uzun sürede yediniz?				
7. Dişleriniz ya da ağzınızdan dolayı elma, koçanla mısır veya et ısırırken ya da çiğnerken zorlandınız?				
8. Dişleriniz ya da ağzınızdan dolayı yemek istediğiniz şeyleri yerken sorun yaşadınız?				
9. Dişleriniz ya da ağzınızdan dolayı bazı kelimeleri söylerken sorun yaşadınız?				
10. Dişleriniz ya da ağzınızdan dolayı gece uyumanızı engelleyen problem yaşadınız?				
11. Dişleriniz ya da ağzınızdan dolayı kendinizi üzgün hissettiniz?				
12. Dişleriniz ya da ağzınızdan dolayı kendinizi hayal kırıklığına uğramış hissettiniz?				
13. Dişleriniz ya da ağzınızdan utandınız?				
14. Dişleriniz ya da ağzınız hakkında diğer insanların ne düşündüğü sizi kaygılandırdı?				
15. Dişleriniz ya da ağzınız nedeniyle başkaları kadar hoş görünmediğinizden endişe duydunuz?				
16. Dişleriniz ya da ağzınızdan dolayı okula gitmediniz?				
17. Dişleriniz ya da ağzınızdan dolayı okul ödevinizi yapmakta zorlandınız?				
18. Dişleriniz ya da ağzınızdan dolayı okula odaklanmakta zorlandınız?				
19. Dişleriniz ya da ağzınızdan dolayı sınıfta söz almak veya yüksek sesle okumak istemediniz?				

20. Dişleriniz ya da ağzınızdan dolayı başka çocukların yanında gülmemeye veya kahkaha atmamaya çalıştınız?					
21. Dişleriniz ya da ağzınızdan dolayı başka çocuklarla konuşmak istemediniz?					
22. Dişleriniz ya da ağzınızdan dolayı başka çocukların yanında bulunmak istemediniz?					
23. Dişleriniz ya da ağzınızdan dolayı spor ve kulüp etkinliklerinden uzak durdunuz?					
24. Dişleriniz ya da ağzınızdan dolayı diğer çocuklar sizle alay etti ya da size isim taktı?					
25. Diğer çocuklar dişleriniz ya da ağzınızla ilgili soru sordu?					