Original research

Validity and reliability of a Turkish pediatric oral health-related quality of life measure

Purpose
This study aimed to develop Turkish measures for Pediatric Oral Health-related Quality of Life (POQL) and evaluate their reliability and validity for use in Turkish children aged 8–14 years (Child Self-Report measure; CSR) and their caregivers (Parent Report-on-Child measure; PRC).

Materials and methods
The English POQL was translated into Turkish, adapted for the Turkish culture, and tested in 149 children and their caregivers attending the Çukurova University Pediatric Dentistry clinics to assess the reliability, internal consistency, and discriminant and convergent validity of the Turkish version.

Results
The internal consistency of the Turkish POQL evaluated using Cronbach's alpha was 0.905 for CSR and 0.887 for PRC. To determine the test–retest reliability, the Turkish POQL was administered to a sub-sample (n=16) a second time 2 weeks after the first survey administration. Intraclass correlation coefficient values of the individual items were 0.895 for CSR and 0.992 for PRC. For total scores, there was a significant difference based on clinical caries status and perceived oral health in both CSR and PRC.

Conclusion
The Turkish POQL is a valid and reliable measure of the perceived impact of oral conditions on children's lives.

Keywords: *Quality of life, oral health, children, validity and reliability, pediatric*

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Introduction

The concept of need has a close relationship to the planning and organization of health care services (1). The drive for the use of patient-reported outcome measures, such as treatment need, has come from the modification of a biomedical perspective to a more comprehensive biopsychosocial model of health (2). Health related quality of life (HRQOL) measures refer specifically to an individual's perception of how their own health affects their activities of daily living and ability to function in society (3–5). The need to determine the significance and priority of oral health problems for children has led to the development of instruments for measuring oral health-related quality of life (6–9). Oral health-related quality of life (OHQL) assesses the

subjective impacts of oral conditions on social and emotional well-being and daily functioning (10, 11). Quality of life reports in combination with clinical data may provide information for planning health actions and positive self-perceptions of oral health status may encourage children and individuals to adopt healthy behaviors (6, 12, 13).

Oral health-related quality of life instruments for children include; The Child Oral Health Impact Profile (COHIP), The Early Childhood Oral Health Impact Scale (ECOHIS), The Child Oral Impacts on Daily Performance (Child-OIDP) and The Child Perception Questionnaire (CPQ) (1, 14-16). However, none of these instruments were developed with an emphasis on the experiences and views of children and parents from low-income populations. To address this need, Huntington *et al.* (17) developed POQL with a particular focus on input from parents and children from low income populations. This new instrument fulfils the need for measuring OHQL in Turkish children and their parents according to their socioeconomic condition, which may be shown by Gökalp *et al.* (18) by low rates of access to dental services, daily tooth brushing habits and dental appointment frequency.

To date, no oral-specific health-related quality of life instruments exists in the Turkish language for 8-14 year age groups. This is especially salient because dental caries is frequent among Turkish children, and there is an urgent need for community-based oral disease prevention programs. Thus, a brief self-report instrument in the form of a simple questionnaire may be helpful both in evaluating such programs as well as for assessing health status in individual children. The aim of this study is to evaluate the internal consistency, reliability and validity of a POQL developed for use on Turkish children between the ages of 8 and 14 years and their parents (caregivers).

Materials and methods

Study design

This is a cross-sectional study of the development and testing of a new oral health-related quality of life instrument developed to measure the impact of oral conditions on the daily lives of Turkish children and their parents. The study protocol and informed consent document was approved by the Çukurova University Ethical Committee, a subdivision of Turkish Ministry of Health, works full accordance with the World Medical Association Declaration of Helsinki (October 2, 2011, meeting number 5, decision number 5). The study started on 15th of March 2010 and ended on 7th of January 2013.

Parents gave written consent for themselves and their children and the children verbally assented to their own participation.

Approach

In the first step, the English POQL instrument was translated into Turkish and adapted to Turkish culture. In the second step, we assessed the reliability, internal consistency, discriminant and convergent validity of the Turkish version of the POQL.

Study sample

For the cultural adaptation process, 23 children and their caregivers attending Çukurova University Pediatric dentistry clinics completed the draft Turkish POQL instruments. Initial linguistic corrections were done by individual interviews with participants during this phase. After adaptation, the finalized Turkish POQL instruments were administered for testing of internal consistency, validity and reliability. A total of 196 children and their caregivers attending Çukurova University Pediatric dentistry clinics were asked to complete the Turkish POQL instruments. Of these, 149 completed the instruments in between 13 December 2011 and 22 May 2012. This convenience sample of 149 children, aged 8 to 14 years, and their caregivers, was used for the analyses described. A subset of 16 individuals from the sample completed the instrument again after two weeks in order to assess test-retest reliability.

Pediatric oral health-related quality of life instruments

The POQL is a 10-item instrument designed to measure oral health-related quality of life in children from both the child's and their caregiver's perspectives. Versions of the instrument for use in 8 to 14 year old children were created to capture two distinct perspectives: children's self-report (CSR) and caregiver's report on their child (PRC). POQL versions were also developed separately in English and Spanish for younger and older age groups of children and their caregivers (19). The original CSR and PRC that we used consisted of 4 domains: physical function (2 items), role function (2 items), social impact (3 items) and emotional impact (3 items). For each item, it was asked "how often the event occurred", with the response options of "all of the time", "some of the time", "once in a while" or "did not happen". It was also separately asked "how bothered the parent or child was by its occurrence", with response options of "very bothered", "somewhat bothered", "bothered a little bit", "never bothered" or "did not happen". A to-

tal POQL score was created by multiplying "how often" by "how bothered"; the sum of the multiplied scores from each survey were divided into the total sum of multiplied scores and multiplied by 100. POQL scores ranged between 0-100, with higher scores reflecting greater negative impacts of the child's oral conditions on their health-related quality of life.

The POQL was originally developed in English and validated in the Greater Boston Area (17). The process we used for developing the Turkish POQL versions followed internationally accepted guidelines for translation and cultural adaptation of self-report instruments (20–22). It consisted of: 1) two separate and independent translations from English to Turkish by two completely bi-lingual native speakers; 2) an initial meeting of an expert panel review committee consisting of 6 health professionals (native Turkish and English speakers, and bilingual speakers) to correct the translations and produce the first two independent Turkish versions; 3) back translations of the two Turkish versions independently by two bi-lingual speakers 4) committee review where the original English POQL and the two back translations were compared by English speakers; 5) corrections and reconciliation to achieve a single Turkish version; 6) pretesting the Turkish version with the target population using a convenience sample of 23 children their caregivers; 7) incorporate feedback from interviews with pre-test individuals; and creation of the final Turkish version (20–22). Face validity and content validity of the Turkish POQL instrument were examined at this stage of the study by the expert panel in order to assess the clarity of the wording of the items prior to the main study. Table 1 and Table 2 show the Turkish translations of POQL Parent Report on Child and Child Self-Report.

Other data collection

In addition to the POQL, we administered a brief questionnaire to collect basic demographic data, as well as general health and dental information. Demographic data included "age" of child, "gender", caregiver (completed the PRC), "parent's education" (highest attained level of formal education of caregiver), "income" (self-perception of family's economic status as reported by the caregiver) and tobacco "smoking" status (whether caregiver smokes or not).

Each child was also asked to self-rate their global oral health status, and caregivers were separately asked to rate their child's global oral health status. The CSR asked: "In general, how would you rate the health of your teeth and gums?" The PSR asked: "In general, how would you rate the health of your child's teeth and gums?" The response options for these questions were: 1=Excellent, 2=Very Good, 3=Good, 4=Fair and 5=Poor.

Clinical dental data collection

Participating children had a clinical dental examination, recording dmft and DMFT according to WHO criteria (7), and determination of treatment urgency as in the U.S. Association of State and Territorial Dental Directors Basic Screening Survey (ASTDD-BSS; 0=no obvious problems; 1=needs early treatment: caries without accompanying signs or symptoms or individuals with other health problems requiring care before their next routine dental visit; 2=needs immediate treatment: signs and symptoms that include pain, infection or swelling) (23). Oral hygiene was recorded based on examination of the four maxillary anterior teeth, as 0=no plaque accumulation; 1=plaque on gingival $1/3^{rd}$ of crown at least one tooth; 2=plaque on greater than $1/3^{rd}$ of crown at least one tooth.

Two clinically experienced examiners were used. Training consisted of a PowerPoint presentation of written descriptions, pictures of caries lesions and soft tissue lesions. According to ASTDD-BSS protocol, examiners also assess treatment urgency and oral hygiene in addition to DMFT and dmft. The inter-examiner agreement obtained on the examination parameters such as treatment urgency, oral hygiene and DMFT on 25% of the children was 0.89 as measured by kappa statistic. Dental treatments of children with any treatment needs were completed in turn.

Statistical analysis

All statistical analyses were performed using SPSS 16.0 software for Windows (SPSS, Inc.; Chicago, IL, USA). The final version of the Turkish POQL was assessed for internal consistency and test-retest reliability. Cronbach's alpha measured the internal consistency. Item-total correlations were calculated by Pearson correlation coefficient allowing us to determine the suitability of the domains of Turkish POQL identified in the factor analysis. Test-retest reliability was conducted in a subset of participants (n=16) two weeks after the initial POQL instrument administration and measured by intraclass correlation coefficient (ICC) (24). We assessed convergent validity by comparing the response on the POQL to responses to their self-rated overall oral health status, using the single-item global self-assessment of current oral health

Table 1. *Turkish translation of POQL Parent Report on Child (*questions for parents or caregivers)*

Genel Sorular	Cevaplar	
Genel olarak çocuğunuzun sağlığı nasıl?	Mükemmel/ çok iyi/ iyi/ orta/ kötü	
Genel olarak çocuğunuzun ağız ve diş sağlığı nasıl?	Mükemmel/ çok iyi/ iyi/ orta/ kötü	
Bir yıl öncesiyle karşılaştırdığınızda çocuğunuzun ağız ve diş sağlığı şimdi nasıl?	Çok daha iyi/ biraz daha iyi/ aynı/ biraz daha kötü/ çok daha kötü	
Genel olarak ağız ve diş sağlığınız nasıl?*	Mükemmel/ çok iyi/ iyi/ orta/ kötü	
Genel olarak diş hekimiyle deneyimleriniz nasıl?*	Mükemmel/ çok iyi/ iyi/ orta/ kötü	
En son diş hekimine ne zaman gittiniz?*	Son 6 ayda/ 6 ile 12 ay arasında/ 1yıldan fazla 2 yıldan az/ 2 ile 5 yıl önce/ 5 yıldan çok veya hiçbir zaman	
En son diş hekimi ziyaretinizin sebebi neydi?*	Düzenli kontrol ve diş taşı temizliği/ acil diş yaralanması/ acil diş ağrısı/ diş çekimi/ dolgu/ kanal tedavisi/ kaplama/ takma diş-protez/ diş teli- yer tutucu/ diğer	

	Cevaplar	
Ölçek Soruları	**Hangi sıklıkla meydana geldi?**	**Ne kadar rahatsızlık verdi?**
Çocuğunuzun ağız veya diş bölgesinden kaynaklanan bir ağrısı oldu mu?	Her zaman/ bazen/ arada bir/ hiçbir zaman/ bilmiyorum	Çok rahatsız edici/ biraz rahatsız edici/ çok az rahatsız edici/ rahatsız edici değil/ hiçbir zaman/ bilmiyorum
Çocuğunuz ağız ve diş problemleri yüzünden yemek yeme de güçlük çekti mi?	Her zaman/ bazen/ arada bir/ hiçbir zaman/ bilmiyorum	Çok rahatsız edici/ biraz rahatsız edici/ çok az rahatsız edici/ rahatsız edici değil/ hiçbir zaman/ bilmiyorum
Çocuğunuz ağız ve diş problemleri yüzünden okulda dikkat sorunu yaşadı mı?	Her zaman/ bazen/ arada bir/ hiçbir zaman/ bilmiyorum	Çok rahatsız edici/ biraz rahatsız edici/ çok az rahatsız edici/ rahatsız edici değil/ hiçbir zaman/ bilmiyorum
Çocuğunuz ağız ve diş problemleri yüzünden okula devamsızlık yaptı mı?	Her zaman/ bazen/ arada bir/ hiçbir zaman/ bilmiyorum	Çok rahatsız edici/ biraz rahatsız edici/ çok az rahatsız edici/ rahatsız edici değil/ hiçbir zaman/ bilmiyorum
Çocuğunuzun ağız ve diş problemlerinden dolayı başkalarının yanında gülümsemekten kaçındığı oldu mu?	Her zaman/ bazen/ arada bir/ hiçbir zaman/ bilmiyorum	Çok rahatsız edici/ biraz rahatsız edici/ çok az rahatsız edici/ rahatsız edici değil/ hiçbir zaman/ bilmiyorum
Çocuğunuz ağız ve diş problemleri yüzünden diğer çocuklardan daha çirkin olduğunu düşünüp endişelendi mi?	Her zaman/ bazen/ arada bir/ hiçbir zaman/ bilmiyorum	Çok rahatsız edici/ biraz rahatsız edici/ çok az rahatsız edici/ rahatsız edici değil/ hiçbir zaman/ bilmiyorum
Çocuğunuz ağız ve diş problemleri yüzünden görünüşünden mutsuz oldu mu?	Her zaman/ bazen/ arada bir/ hiçbir zaman/ bilmiyorum	Çok rahatsız edici/ biraz rahatsız edici/ çok az rahatsız edici/ rahatsız edici değil/ hiçbir zaman/ bilmiyorum
Çocuğunuz ağız ve diş problemleri yüzünden sinirli ve üzgün oldu mu?	Her zaman/ bazen/ arada bir/ hiçbir zaman/ bilmiyorum	Çok rahatsız edici/ biraz rahatsız edici/ çok az rahatsız edici/ rahatsız edici değil/ hiçbir zaman/ bilmiyorum
Çocuğunuz ağız ve diş problemleri yüzünden endişelendi mi?	Her zaman/ bazen/ arada bir/ hiçbir zaman/ bilmiyorum	Çok rahatsız edici/ biraz rahatsız edici/ çok az rahatsız edici/ rahatsız edici değil/ hiçbir zaman/ bilmiyorum
Çocuğunuz ağız ve diş problemleri yüzünden ağladı mı?	Her zaman/ bazen/ arada bir/ hiçbir zaman/ bilmiyorum	Çok rahatsız edici/ biraz rahatsız edici/ çok az rahatsız edici/ rahatsız edici değil/ hiçbir zaman/ bilmiyorum

which ranged from "poor" to "excellent." In addition, discriminant validity was assessed by comparing scale scores and total scores for children with untreated caries to children who were caries-free (25). The differences in POQL scores between the groups were assessed using the Mann-Whitney U-test.

Table 2. *Turkish translation of POQL Child Self-report*	
Genel Sorular	**Cevaplar**
Genel olarak sağlığın nasıl?	Mükemmel/ çok iyi/ iyi/ orta/ kötü
Genel olarak ağız ve diş sağlığın nasıl?	Mükemmel/ çok iyi/ iyi/ orta/ kötü
Bir yıl öncesiyle karşılaştırdığında ağız ve diş sağlığın nasıl?	Çok daha iyi/ biraz daha iyi/ aynı/ biraz daha kötü/ çok daha kötü
Genel olarak diş hekimiyle deneyimlerin nasıl?	Mükemmel/ çok iyi/ iyi/ orta/ kötü
En son diş hekimine ne zaman gittin?	Son 6 ayda/ 6 ile 12 ay arasında/ 1yıldan fazla 2 yıldan az/ 2 ile 5 yıl önce/ 5 yıldan çok veya hiçbir zaman
En son diş hekimi ziyaretinin sebebi neydi?	Düzenli kontrol ve diş taşı temizliği/ acil diş yaralanması/ acil diş ağrısı/ diş çekimi / dolgu/ kanal tedavisi/ kaplama/ takma diş-protez/ diş teli- yer tutucu/ diğer

	Cevaplar	
Ölçek Soruları	**Hangi sıklıkla meydana geldi?**	**Ne kadar rahatsızlık verdi?**
Ağız ve diş problemlerin yüzünden ağrın oldu mu?	Her zaman/ bazen/ arada bir/ hiçbir zaman/ bilmiyorum	Çok rahatsız edici/ biraz rahatsız edici/ çok az rahatsız edici/ rahatsız edici değil/ hiçbir zaman/ bilmiyorum
Ağız problemlerin yüzünden yemek yemede (sert/ sıcak/ soğuk) güçlük çektin mi?	Her zaman/ bazen/ arada bir/ hiçbir zaman/ bilmiyorum	Çok rahatsız edici/ biraz rahatsız edici/ çok az rahatsız edici/ rahatsız edici değil/ hiçbir zaman/ bilmiyorum
Ağız ve diş problemlerin yüzünden okula dikkatini vermekte güçlük çektin mi?	Her zaman/ bazen/ arada bir/ hiçbir zaman/ bilmiyorum	Çok rahatsız edici/ biraz rahatsız edici/ çok az rahatsız edici/ rahatsız edici değil/ hiçbir zaman/ bilmiyorum
Ağız ve diş problemlerin yüzünden okula devamsızlık yaptın mı?	Her zaman/ bazen/ arada bir/ hiçbir zaman/ bilmiyorum	Çok rahatsız edici/ biraz rahatsız edici/ çok az rahatsız edici/ rahatsız edici değil/ hiçbir zaman/ bilmiyorum
Ağız ve diş problemlerin yüzünden diğer insanların yanında gülmekten veya kahkaha atmaktan kaçındın mı?	Her zaman/ bazen/ arada bir/ hiçbir zaman/ bilmiyorum	Çok rahatsız edici/ biraz rahatsız edici/ çok az rahatsız edici/ rahatsız edici değil/ hiçbir zaman/ bilmiyorum
Başkaları tarafından güzel görünmediğini düşündün mü?	Her zaman/ bazen/ arada bir/ hiçbir zaman/ bilmiyorum	Çok rahatsız edici/ biraz rahatsız edici/ çok az rahatsız edici/ rahatsız edici değil/ hiçbir zaman/ bilmiyorum
Ağız ve diş problemlerin yüzünden görünüşünden mutsuz oldun mu?	Her zaman/ bazen/ arada bir/ hiçbir zaman/ bilmiyorum	Çok rahatsız edici/ biraz rahatsız edici/ çok az rahatsız edici/ rahatsız edici değil/ hiçbir zaman/ bilmiyorum
Ağız ve diş problemlerin yüzünden sinirli ve üzgün oldun mu?	Her zaman/ bazen/ arada bir/ hiçbir zaman/ bilmiyorum	Çok rahatsız edici/ biraz rahatsız edici/ çok az rahatsız edici/ rahatsız edici değil/ hiçbir zaman/ bilmiyorum
Ağız ve diş problemleri yüzünden endişelendin mi?	Her zaman/ bazen/ arada bir/ hiçbir zaman/ bilmiyorum	Çok rahatsız edici/ biraz rahatsız edici/ çok az rahatsız edici/ rahatsız edici değil/ hiçbir zaman/ bilmiyorum
Diş sorunların yüzünden ağladığın oldu mu?	Her zaman/ bazen/ arada bir/ hiçbir zaman/ bilmiyorum	Çok rahatsız edici/ biraz rahatsız edici/ çok az rahatsız edici/ rahatsız edici değil/ hiçbir zaman/ bilmiyorum

Results

Turkish POQL adaptation process

After the interviews with the individual patients and parents, and the professional staff committee reviews, participants and committee members reported that all items were relevant in relation to children's oral health. The English, "don't want", in the 5th POQL question was replaced with the word "avoid" (kaçınmak) in the Turkish version. For the 6th POQL question instead of the word "worry", "think" (düşünmek) was used. With the exception of these changes the conceptual meaning was preserved as in the English version.

The demographic data of children and their caregivers who completed the surveys is; seventy-six (53.3%) children were male and 73 (46.7%) children were female of the total 149 participants. The age of children range were between 7 and 14 (mean±SD: 10.82±1.76). "Caregivers" were parents of the child who filled the survey while "Parent's education" was the highest grade or level of school that parent have completed. "Income" was a self-report of the economic status of the child's family and "Parent smoke" was current smoking situation.

Factor Analysis

An exploratory iterated principal factor analysis on the 10 Turkish POQL items was conducted. Varimax rotation was used with the eigen value of 1. Turkish CSR and PCR data were separately rotated. Based on varimax rotation separately done for Turkish CSR and PCR, the variance was distributed across three factors and individual items clustered with a coherent theme to each factor: role and physical functioning, social functioning and emotional functioning. Factor loadings for "role and physical functioning" were .669, .679, .873 and .828 (pain, trouble eating, pay attention at school, miss school); "emotional impact" were .856, .820 and .789 (angry/upset, worry, cry); and "social impact" were .848, .836 and .731 on CSR. Factor loadings for "role and physical functioning" were .610, .785, .757 and .849 (pain, trouble eating, pay attention at school, miss school); "emotional impact" were .760, .873 and .782 (angry/upset, worry, cry); and "social impact" were .774, .805 and .697 on PRC. Thus, the Turkish version of POQL has 3 domains instead of the 4 domains in the English version. The English version includes Physical Functioning, Role Functioning, Social Impact and Emotional Impact. In contrast, the Role Function subscale in Turkish version includes both the Physical Impact and Role Function items of the original scale (17). For Turkish children and their caregivers the items "pain" and "difficulty while eating" are associated with the items "pay attention/school" and "miss school".

Reliability

The internal consistency was assessed using Cronbach's alpha coefficient. For the Turkish CSR Cronbach alpha was 0.905 and for the Turkish PCR it was 0.887. All the subscales show strong correlations with the total score ranging between 0.814 and 0.887. Cronbach's alpha coefficients did not increase by deleting any item. The item-total correlation coefficients ranged from 0.661 to 0.793 (Table 3).

The test-retest reliability of the Turkish POQL was examined through a sub-sample (n=16) completing the instrument a second time two weeks later the first survey application (Table 4). ICC values were 0.895 for the child self report and 0.992 for the parent report on child in Turkish version. ICC values of child report subgroups (role and physical function, social function and emotional function) ranged between 0.852 and 0.911. Parent report on child ICC values of subgroups ranged between 0.967 and 0.996. Discriminant validity of the scales and total scores was examined by comparing children with caries with children known to be caries free, and convergent validity by relating POQL scores with global perceptions of oral health status (the OH1) reported by child and caregiver separately. Table 5 shows the average scale and total scores by caries status and perceived oral health. For each scale and total score there was a significant difference by caries status and by child and parent-reported oral health.

Table 3. *Internal consistency reliability (Cronbach's alpha) interscale correlation*

	Role & Physical Function	Social Impact	Emotional Impact	Total POQL Score
CSR - Role & Physical Function	.862			
CSR - Social Impact	.615	.863		
CSR - Emotional Impact	.566	.553	.847	
CSR - Total Score	.887	.836	.815	.905
PRC - Role & Physical Function	.820			
PRC - Social Impact	.541	.789		
PRC - Emotional Impact	.550	.554	.853	
PRC - Total Score	.863	.827	.814	.887

Cronbach's alpha shown in bold
CSR: Child Self-Report measure; PRC: Parent Report-on-Child; POQL: Pediatric oral-health related quality of life

Table 4. *Test-retest of child self report and parent report on child (n=16)*

	Test1 Mean (sd)	Test2 Mean (sd)	Intraclass correlation coefficient		Paired T Test	
			ICC	p	T	p
CSR - Total Score	14.42 (14.31)	12.60 (10.38)	0.895	<.001	0.948	0.358
CSR - Role and Physical Function	13.28 (15.88)	11.84 (10.66)	0.852	<.001	0.590	0.564
CSR - Social Impact	14.58 (13.81)	12.15 (10.23)	0.853	<.001	1.005	0.282
CSR - Emotional Impact	15.79 (18.41)	13.88 (16.94)	0.911	<.001	0.754	0.462
PRC - Total Score	15.31 (13.74)	14.84 (12.35)	0.992	<.001	0.796	0.439
PRC - Role and Physical Function	15.49 (12.54)	14.84 (10.23)	0.967	<.001	0.639	0.533
PRC - Social Impact	20.31 (23.67)	19.79 (23.78)	0.989	<.001	0.417	0.682
PRC - Emotional Impact	10.06 (13.79)	9.8 (13.18)	0.996	<.001	0.436	0.669

CSR: Child Self-Report measure, PRC: Parent Report-on-Child, SD: standard deviation

Table 5. *Pediatric oral health related quality of life scores by caries status and reported oral health of child and caregiver*

SCORE	CARIES STATUS			OH1 – Child Self Report			OH1 – Parent Report on Child		
	Caries free	Caries	p	E, VG, G*	F, P*	p	E, VG, G*	F, P*	p
CSR – Total Score	15.0	26.2	<.001	13.6	35.2	<.001	13.2	34.1	<.001
CSR – Role & Physical Function	15.5	31.0	<.001	16.3	39.6	<.001	15.6	38.8	<.001
CSR – Social Impact	12.6	22.8	0.005	10.7	32.0	<.001	10.9	30.1	<.001
CSR – Emotional Impact	16.7	23.0	0.034	12.8	32.0	<.001	12.3	31.7	<.001
PRC – Total Score	14.4	24.1	0.001	15.4	28.8	<.001	11.9	35.1	<.001
PRC – Role & Physical Function	16.4	26.9	0.003	16.9	32.8	<.001	13.6	35.7	<.001
PRC – Social Impact	16.2	24.4	0.028	17.5	27.8	0.001	12.3	33.4	<.001
PRC – Emotional Impact	10.0	19.9	0.002	11.2	24.4	<.001	8.4	26.9	<.001

*E, VG, G: excellent, very good, good; *F, P: Fair, Poor; CSR: Child Self-Report measure; PRC: Parent Report-on-Child; SD: standard deviation

Discussion

Studies in English speaking countries, evaluating dental impacts on the quality of life, have been conducted since 1980 (26). In order to use these instruments among other populations, instruments need to be translated, adapted and validated. The process of translation and cross cultural adaptation was done according to WHO criteria (20). The English and Turkish versions were conceptually equivalent except in regards two items, "don't want" and "worry", resulting in modest differences in meaning from the English version before the initiating the testing process for reliability and validity.

Based on varimax rotation separately done for Turkish CSR and PCR, the variance was distributed across three factors. Distinctive from the four factor English version, role and physical functioning perception loadings for the Turkish version were on one factor defined as role plus physical functioning. This could be the result, for example, of a Turkish cultural perspective binding physical health to school success and attendance.

In relation to internal consistency, the item-total correlation values were higher than Streiner and Norman's (25) recommended level of 0.20. The Cronbach alpha of this analysis was satisfactory (between r=0.661 and r=0.793 in child report, between r=0.664 and r=0.768 in parent report on child). Cronbach alpha values and interscale correlations were close to those in the English version. The child self-report's Cronbach's α values were between 0.55 and 0.83 while the parent report on child values were between 0.54 and 0.86 (17).

Assessment instruments should be reproducible over time, the two week interval between the survey applications revealed high test-retest reliability. In general total and subscale scores of child and parent report showed ICC values r>0.7, indicating good reproducibility. Parent report on child test-retest correlation was better than for the child self- report. The ICC of the Turkish version were between 0.85 and 0.99, higher than those in the English version (0.49 and 0.88) (17). By comparison, ICC values of the Turkish PedsQL condition-specific version for arthritis were 0.79 to 0.91 for child self-reporting and 0.80 to 0.88 for parent report on child. Parent-child concordance

was 0.42 to 0.92 for the PedsQL Turkish version. Similarly, the Spanish version of the POQL showed high values of Cronbach α, between 0.86 and 0.93, for item-domain and item-total (19). The Spanish version of the POQL's ICC values showed similar results with the present study.

Importantly, the Turkish POQL instrument is able to discriminate between children with and without dental caries. Children with untreated caries had higher average total and subscale scores than children without untreated caries (p<0.05). The English version of the POQL showed similar results regarding untreated caries; caries-free children as compared to children with untreated caries showed significant differences by total POQL score, and by physical and emotional function scores based on the child self-report instrument. On the other hand, the PRC instrument showed significant difference between the groups for total POQL, role, physical and emotional function scores (17). Both the Turkish and English POQL instruments also demonstrated strong associations between caries experience and POQL scores like the Spanish POQL instruments; significant differences between the groups by dental caries were seen (p=0.4) (19).

Convergent validity was performed by grouping the answers to the "global rating of oral health item" (OH1) dichotomized as excellent, very good, and good versus fair or poor. The differences between POQL scores in the "Excellent", "Very Good" and "Good" categories were statistically significantly different than in parents and children who rated the child's oral health as fair or poor. Turkish subscales and total POQL scores were worse in the OH1 groups rating their oral health as fair/poor. The differences in POQL scores among OH1 response groupings and caries experience groupings were also consistent.

To the best of our knowledge this is the first study among 8-14 year old children in Turkey on pediatric oral health-related quality of life. In order to enhance the assessment of oral health and more comprehensively evaluate the oral health needs of children in different age groups, pediatric oral-health related quality of life measurements should be implemented across multiple Turkish speaking populations. Further studies with larger sample sizes could add more information to the literature. Research using instruments like the POQL is needed to more accurately determine the oral health needs of children and the impacts of dental problems on their quality of life.

Conclusion

The Turkish POQL is a quantitative and objective means by which to measure the impact of oral health in Turkish children and their families. Our findings suggest that the Turkish version of the POQL is a valid and reliable measure of the impact of oral conditions on the day-to-day lives of 8-14 year old Turkish children.

Türkçe öz: Türkçe Pediatrik Ağız Sağlığında Yaşam Kalitesi (POQL) Ölçeğinin Geçerlilik ve Güvenilirliğinin İncelenmesi. Amaç: Bu çalışmanın amacı Türkçe Pediatrik Ağız Sağlığında Yaşam Kalitesi (POQL) enstrümanının 8-14 yaş aralığındaki Türk çocukları ve ebeveynleri açısından geçerlilik ve güvenilirliğinin ölçülmesidir. Gereç ve Yöntem: İngilizce POQL Türkçeye çevrilmiş ve Türk kültürüne adapte edilmiştir. Çukurova Üniversitesi Çocuk Diş Hekimliği kliniğinde 149 çocuk ve onların ebeveynlerinin yaptığı anketlerle geçerliliği, iç tutarlılığı, ayırt edici tutarlılığı ve yakınsak geçerliliği ölçülmüştür. Bulgular: Türkçe POQL'ın iç tutarlılığı Cronbach alfa ile ölçülmüştür ve çocuk anketi için 0,905, ebeveyn anketi içinse 0,887 sonuçları bulunmuştur. Test-retest geçerliliği için alt örneklem seçilmiş (n=16); bu grubun anketleri iki hafta sonunda yeniden yapması istenmiştir. Sınıf içi korelasyon katsayısının bireysel sonuçları çocuk anketi için 0,895 ve ebeveyn anketi için 0,992'dir. Toplam skorlar açısından ise anketler arasında klinik çürük durumu ve algılanan ağız sağlığı durumu açısından her iki anket için anlamlı fark bulunmaktadır. Sonuç: Türkçe POQL çocukların ağız sağlıkları ile ilgili algıladıkları etkiyi ölçmek açısından geçerli ve güvenilir bir ölçektir. Anahtar Kelimeler: Yaşam kalitesi, ağız sağlığı, çocuk, geçerlilik ve güvenilirlik, pediatrik

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