

Assessment of the Reliability and Validity of the Farsi Translation of the “Orthognathic Quality of Life Questionnaire” in 10-14 Year-Olds in Shiraz

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Abstract

Background and Aim: The Orthognathic Quality of Life Questionnaire (OQLQ) was designed by Cunningham in 2001 to assess the quality of life of patients in relation to orthodontic treatments. This study sought to evaluate the validity and reliability of the Farsi version of OQLQ in 10-14 year-olds in Shiraz.

Materials and Methods: This descriptive analytical study was conducted on 240 students in the age range of 10-14 years that were randomly selected from the 4 educational districts in Shiraz. One elementary and one middle school were selected from each district. The OQLQ questionnaire contains two sections. The first section asks for demographic information of patients and the second part contains 22 questions regarding the quality of life in relation to dental status. This questionnaire was translated to Farsi using the standard forward-backward translation method. The standardized Cronbach's alpha, alpha if item deleted, item-total correlation and inter-item coefficients were used for the assessment of the reliability and validity of the questionnaire. For the calculation of test-retest validity, 30 students filled out the questionnaire again 2 weeks after the first session. Mann Whitney U and Chi square tests were used to assess the correlation between the different aspects of the quality of life in the questionnaire and willingness to take the treatment. Data were analyzed using SPSS version 18 software.

Results: The internal consistency analysis of the OQLQ indicated a good correlation between questions and domains of the questionnaire. Cronbach's alpha in this study was 0.86. For the calculation of test-retest reliability of the questionnaire, weighted kappa was found to be 0.91. Mann Whitney U and Chi square tests found significant differences between willingness for orthodontic treatment and dentofacial esthetics (part 2, $p=0.008$) and knowledge about dentofacial esthetics (part 4, $p=0.018$).

Conclusion: Farsi translation of OQLQ is a suitable tool for the assessment of the effect of dentofacial problems on the quality of life of orthognathic patients in an Iranian population.

Key Words: Orthodontic status, Quality of life, Reliability, Validity

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Introduction

Quality of life is defined as one's perception of their own wellbeing and satisfaction or dissatisfaction with important aspects of life [1]. Health sta-

tus is an important aspect of quality of life and has a significant impact on it [2]. Quality of life in relation with oral health is defined as no negative effect of oral and dental conditions on one's social

life and having positive feelings about their dentofacial status [3]. Studies have shown that oral and dental problems can negatively affect psychological, social and physical status of patients and compromise their quality of life by affecting their social position and inter-personal relations [4]. Oral and dental problems such as malocclusion are highly prevalent affecting the physical, economical, social and psychological aspects of patients' lives [5]. It has been well established that the majority of patients with malocclusion feel embarrassed in social positions and may have negative personal perceptions towards their own dentofacial appearance [6, 7]. Thus, it seems logical to expect that orthodontic treatments reinforce the self-esteem and reduce the social anxiety of patients [8, 9]. In fact, greater attention should be paid to the effects of malocclusion on the physical, psychological and social aspects of quality of life of patients to better elucidate this subject and unveil the actual reasons behind the demand for orthodontic treatments (other than the clinical factors and the clinician's professional opinion) [7]. In other words, we may state that people have different perceptions of malocclusion and patient's perception of his/her own condition may not correlate with its severity [10]. Such differences are responsible for variable demands of patients for orthodontic treatment [11]. During the past 20 years, several tools have been introduced for the assessment of oral health related quality of life. OQLQ was introduced by Cunningham as a suitable tool for the assessment of orthognathic quality of life [12, 13]. This questionnaire has 22 questions and includes 4 different domains of quality of life in relation to orthognathic status namely the social aspect, dentofacial esthetics, oral function and knowledge about dentofacial esthetics (self-confidence). This questionnaire has been evaluated by several researchers in the UK [12], Brazil [13] and Jordan [14].

An assessment tool should have adequate reliability and validity in order for the researcher to be able to collect the required data and by analyzing these data he/she will evaluate the study hypothesis and answer the study's questions. Validity means that the scale and content of the instrument or questions included in the questionnaire accurately measure the variables and subject of the study. Reliability

also known as accuracy means that the tool designed for measurement of a specific variable will yield similar results if used in another time or location for the same purpose. In other words, it should be reproducible [6]. Considering all the above and the need for the assessment of orthodontic status of children and its correlation with their quality of life, this study was performed to evaluate the reliability and validity of the Farsi translation of the questionnaire introduced by Cunningham.

Materials and Methods

This descriptive analytical study was conducted on 10-14 year-old students in Shiraz during 2012. Data were collected using the Farsi translation of OQLQ introduced by Cunningham in 2001. The questionnaire contained two parts. Part 1 included demographic characteristics namely first name, last name, age, gender and educational district of students and the 2nd part included 22 questions about the quality of life in relation to dental status. Each question had 4 answer choices as follows:

Selection of choice 1 means that the issue covered by the statement slightly bothers you. Choice 4 means that the issue covered in the statement bothers you a lot. Choices 2 and 3 rank in between the two extremes. Selection of the choice "N/A" means that the issue covered in the statement does not apply to you or if it does, it does not bother you at all.

The main questionnaire is based on the correlation of these questions in 4 separate domains including social aspect, dentofacial esthetics, oral function and knowledge about dentofacial esthetics (self-confidence). The final score of the questionnaire is the sum of scores given to each question and can range from 0-88. High and low scores indicate poor and good OQLQ, respectively. This questionnaire was translated in 3 steps. First, the original English version was translated to Farsi by two expert translators separately. In the next step, the translated Farsi version was translated back to English (Backward translation). This version was compared with the original version. The two versions were similar with only slight differences. This version was translated to Farsi and the final Farsi version was prepared.

In order to qualitatively assess the validity of its content, 5 experts were requested to express their

opinions regarding the grammar and choice of words. Next, in a pilot study, 30 students were asked to fill out the questionnaire. The questions were revised accordingly and the revised questionnaire was used in the final study. This descriptive analytical study was conducted on 250 students (130 females and 120 males) aged 10-14 yrs. Students were selected from schools in 4 educational districts in Shiraz using multi-level sampling after obtaining approval from the Ministry of Education and Training. Information regarding the study was given to parents and a written informed consent was obtained. The inclusion criteria were signing a written informed consent by the parents and no history of previous or current orthodontic therapy. Students were examined in a well-lit room by a pediatric dentistry resident. Ten students were excluded from the study (4 females and 6 males) because their parents did not sign the consent form or the children had already undergone orthodontic treatment.

OQLQ was filled out by the students and they were asked to express their desire for orthodontic treatment at the end of the questionnaire by a yes or no answer. The internal consistency of data was assessed by standardized Cronbach's alpha, alpha if item deleted, inter-item and item-total correlation coefficients. For the calculation of test-retest reliability, 35 students filled out the questionnaire twice with a 2-week interval. The reliability was assessed by weighted kappa statistics.

SPSS version 18 software was used for data analysis. Mann Whitney U and Chi square tests were applied to find correlations between different aspects of quality of life in the questionnaire and desire for orthodontic therapy.

Results

A total of 240 students in the age range of 10-14 years were randomly selected from two elementary (n=30) and middle schools (n=30) in each of the 4 educational districts in Shiraz. Students filled out the questionnaire. Internal consistency analysis of data for evaluation of reliability and question domains of the Farsi version of the questionnaire are shown in Table 1. A good correlation existed between the domains and questions in the Farsi version of the questionnaire. The low "item total correlation" indicated the low correlation of question

with the understudy domain. Cronbach's alpha in this study was found to be 0.86. For the test-retest reliability of the questionnaire, weighted kappa was found to be 0.91.

Criterion validity analysis indicated that children who were personally more willing to undergo orthodontic treatment were also in greater need of treatment from the dentist's perspective and scored higher in the questionnaire (Table 2). According to Mann Whitney U and Chi square tests, of the 4 domains evaluated in this study, desire for orthodontic treatment had a significant correlation with the second domain (dentofacial esthetics, $p=0.008$) and the fourth domain (knowledge about the dentofacial esthetics, $p=0.018$). However, no association was observed with the first domain (social aspects of quality of life) or the third domain (oral function).

Discussion

In order to be chosen for use in a country, a tool must have acceptable psychological characteristics and must be culturally relevant for the respective population [15,16]. Dentofacial disorders affect psychological, physical and social aspects of quality of life of patients. Such disorders can negatively influence the function and interpersonal relations of patients [17]. This study was the first to evaluate the reliability and validity of the Farsi version of OQLQ in an Iranian population. The results showed that the questionnaire had optimal reliability and validity and there were excellent correlations between the questions and domains. Bortoluzzi et al, in their study in Brazil concluded that this questionnaire had adequate reliability and validity among children [13].

Our study results demonstrated that the mean OQLQ among an Iranian population was almost equal to the value in a Brazilian population [13]. However, the mean OQLQ in our study was lower than that in British [12] and Jordanian populations [14]. This issue may be attributed to the cultural and value system differences among different communities. The Farsi version of this questionnaire contains relatively simple and understandable questions for the Iranian population. In the Farsi version of the questionnaire, some questions in

Table 1. Internal consistency analysis for different domains of the Farsi version of OQIQ questionnaire

Domain/Question	Item-total correlation	Cronbach's alpha if item deleted
Domain 1: Social aspect	0/62	
15- When I meet someone for the first time, I try to cover my mouth	0/68	0/854
16- I worry about meeting people for the first time	0/71	0/849
17- I worry that people will make hurtful comments about my appearance	0/48	0/853
18- I lack confidence when I am out socially	0/58	0/852
19- I do not like to smile when meeting people	0/67	0/856
20- I sometimes get depressed because of my appearance	0/86	0/853
21- I sometimes think that people are staring at me	0/81	0/855
22- Comments about my appearance really upset me, even when I know people are just joking	0/75	0/856
Domain 2: Dentofacial esthetics		
1- I am self-conscious about the appearance of my teeth	0/28	0/857
7- I do not like to see my profile	0/61	0/85
10- I do not like to have my picture taken	0/73	0/8540
11- I do not like being seen on a video	0/64	0/856
14- I am self-conscious about my facial appearance	0/54	0/857
Domain 3: Oral function		
2- I have problems biting	0/74	0/859
3- I have problems chewing	0/82	0/858
4- There are some foods I avoid eating because the way my teeth meet makes it difficult	0/63	01/860
5- I do not like eating in public places	0/45	0/859
6- I feel pain in my face/jaw	0/72	0/862
Domain 4: Knowledge about dentofacial esthetics		
8- I spend too much time studying my face in the mirror	0/65	0/859
9- I spend too much time studying my teeth in the mirror	0/46	0/859
12- I often stare at other people's teeth	0/74	0/856
13- I often stare at other people's faces	0/64	0/857

Intra-class correlation coefficient: First domain: 0.83, second domain: 0.84, third domain: 0.72, forth domain: 0.79

Table 2. Assessment of criterion validity for the comparison of desire for orthodontic treatment among the understudy population (all in need of orthodontic therapy)

Domain	Mean	SD	P value
Social aspect			
Desire for treatment (personal)	16/51	3/91	</001
Need for treatment (dentist)	20/02	4/27	</001
No desire for treatment	5/03	3/93	</001
No need for treatment	9/25	4/44	</001
Dentofacial esthetics			
Desire for treatment (personal)	6/33	3/03	</001
Need for treatment (dentist)	8	3/7	</001
No desire for treatment	2/15	2/63	</001
No need for treatment	3/6	2/7	</001
Oral function			
Desire for treatment (personal)	6/33	4/01	</001
Need for treatment (dentist)	8/8	4/65	</001
No desire for treatment	2/85	7/05	</001
No need for treatment	4/03	2/65	</001
Knowledge about dentofacial esthetics			

Desire for treatment (personal)	6/04	3/71	</001
Need for treatment (dentist)	5/4	2/73	</001
No desire for treatment	3/30	2/61	</001
No need for treatment	4/65	2/85	</001

some domains have low consistency with other questions. This issue was also observed in the original questionnaire and the Brazilian version. In the original questionnaire, question 1 in the second domain and question 8 in the fourth domain have consistency below the standard limit. In the Portuguese/Brazilian version, in addition to the mentioned two questions, question 5 in the third domain has the same problem. In the Farsi version, questions 1, 5, 9 and 17 had consistency below the standard limit. Although except for question 1 (0.28), the consistency was close to the standard limit in the remaining 3 questions.

The results of criterion validity analysis indicated that children who were personally more willing to undergo orthodontic treatment were also in greater need for treatment from the dentist's perspective and scored higher in the questionnaire. Assessment of the responses of the study population reveals that females responded to questions about different aspects of orthognathic quality of life with greater sensitivity. Of the 4 domains evaluated in this study, desire for orthodontic treatment had significant correlations with the second domain (dentofacial esthetics, $P=0.008$) and the fourth domain (knowledge about dentofacial esthetics, $P=0.018$). However, no correlation was found between the desire for orthodontic treatment and social aspects of quality of life (first domain) or the third domain (oral function). These findings are in accord with the results of Pabari et al [18]. They reported that the desire for leveling and aligning the teeth and improve the smile was the key motive for orthodontic treatment among 18-64 year-olds. In a study by Sergl and Zentner [19] self-perception of appearance was suggested to be the main motive for orthodontic treatment and complaints of oral/dental function had a lower rank. These findings are in agreement with those of Kiak et al, [20] and Williams et al [21]. They also stated that dentofacial appearance was the main motivating factor for orthognathic treatments.

Based on our obtained results, children who scored higher (lower quality of life) in the OQLQ had greater desire for orthodontic treatment.

Conclusion

Within the limitations of this study, we may conclude that OQLQ is a suitable tool for the assessment of dentofacial problems among an Iranian population.

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References

- 1- Becker M, Diamond R, Sainfort F. A new patient focused index for measuring quality of life in persons with severe and persistent mental illness. *Quality of Life Res.* 1993 Aug; 2(4):239-51.
- 2- Cunningham SJ, Hunt NP. Quality of life and its importance in orthodontics. *J Orthod.* 2001 Jun; 28(2):152-8.
- 3- Inglehart M, Bagramian RA. Oral health-related quality of life. Chicago: Quintessence; 2002 Aug: 4(2):154-159.
- 4- Gift HC, Redford M. Oral health and the quality of life, *Clin in Ger Med.* 1992 Aug;8(3):673-83.
- 5- Bedi R, Gulati N, McGrath C. A study of satisfaction with dental services among adults in the United Kingdom. *Br Dent J.* 2005 Apr 9; 198(7): 433-7.
- 6- Shaw WC. The influence of children's dentofacial appearance on their social attractiveness as judged by peers and lay adults. *Am J Orthod.* 1981 Apr;79(4):399-415.
- 7- Zhang M, McGrath C, Hagg U. The impact of malocclusion and its treatment on quality of life: a literature review. *Int J Pediat Dent.* 2006 Nov; 16(6):381-7.

- 8- Albino JE, Lawrence SD, Tedesco LA. Psychological and social effects of orthodontic treatment. *J Behav Med.* 1994 Feb;17(1):81-98.
- 9- Cunningham SJ, O'Brien C. Quality of life and orthodontics. *Sem in Orthod.* 2007 Aug; 13(1):96-103.
- 10- Kiyak HA. Cultural and psychologic influences on treatment demand. *Sem in Orthod.* 2000 Apr; 26(2):504-14.
- 11- Feu D, De Oliveira BH, De Oliveira Almeida MA, Kiyak HA, Miquel JA. Oral health-related quality of life and orthodontic treatment seeking. *Am J Orthod Dentofacial Orthop.* 2010 Aug; 138(2):152-9.
- 12- Cunningham SJ, Garratt AM, Hunt NP. Development of a condition-specific quality of life measure for patients with dentofacial deformity: I. Reliability of the instrument. *Com Dent Oral Epidemiol.* 2000 Jun; 28(3):195-201.
- 13- Bortoluzzi MC, Manfro R, Soares IC, Presta AA. Cross-cultural adaptation of the orthognathic quality of life questionnaire (OQLQ) in a Brazilian sample of patients with dentofacial deformities. *Med Oral Patol Oral Cir Bucal.* 2011 Aug 1; 16(5):e694-9.
- 14- Al-Ahmad HT, Al-Sa'di WS, Al-Omari IK, Al-Bitar ZB. Condition-specific quality of life in Jordanian patients with dentofacial deformities: A comparison of generic and disease-specific measures. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2009 Jan; 107(1):49-55.
- 15- Streiner DL, Norman GR. Health measurement scales. A practical guide to their development and use. 2nd ed. New York: Oxford University Press; 2000.
- 16- Astrom AN, Haugejorden O, Skaret E, Trovik TA, Klock KS. Oral impacts on daily performances in norwegian adults: Validity, reliability and prevalence estimates. *Europ J Oral Sci.* 2005 Aug; 13(4):289-96.
- 17- Modig M, Andersson L, Wårdh I. Patients' perception of improvement after orthognathic surgery: pilot study. *Br J Oral Maxillofac Surg.* 2006 Feb; 44(1):24-7.
- 18- Pabari S, Moles DR, Cunningham SJ. Assessment of motivation and psychologic characteristics of adult orthodontic patients. *Am J Orthod Dentofacial Orthop.* 2011 Dec; 140(6):263-72.
- 19- Seroglou HG, Zentner A. Study of psychosocial aspects of adult orthodontic treatment. *Int J Adult Orthod Orthognath Surg.* 1997; 12(1):17-22.
- 20- Kiyak HA, Hohl T, Sherrick P, West RA, McNeill RW, Bucher F. Sex differences in motives for and outcomes of orthognathic surgery. *J Oral Surg.* 1981 Oct; 39(10):757-64.
- 21- Williams AC, Shah H, Sandy JR, Travess HC. Patients' motivations for treatment and their experiences of orthodontic preparation for orthognathic surgery. *J Orthod.* 2005 Sept; 32(3):191-202.