Validation of a Malay version of the short-form Child Perceptions Questionnaire (CPQ_{11-14}) in Brunei

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Abstract

Aim: The objectives of this study were to examine the test-retest reliability, construct and discriminative validities of the Malay version of the Child Perceptions Questionnaire (CPQ_{11-14}).

Methods: This study was a cross-sectional survey of a convenience sample of 11-14-year-old primary schoolchildren attending government schools in Brunei. Children were examined for dental caries and malocclusion, and oral-health-related quality of life (OHRQoL) was measured using the short-form Malay version of the CPQ_{11-14}.

Results: A total of 457 children (51.9% female) were examined. Construct validity was satisfactory, demonstrating significant associations between the mean CPQ_{11-14} scores and global ratings of oral health and overall well-being. Associations with caries experience and malocclusion were less clear-cut.

Conclusion: The Malay short-form CPQ_{11-14} shows some promise as an instrument for measuring OHRQoL in 11-14-year-old Bruneian children, although its ability to discriminate among Bruneian children in different malocclusion treatment need categories seems to be limited.

Key Words: Caries experience, malocclusion, quality of life, validity, short-form CPQ_{11-14}

Introduction

The Child Perceptions Questionnaire (CPQ_{11-14}) was developed in Toronto as a measure of oral health-related quality of life (OHRQoL) specifically for 11-to-14-year-old children[1]. The intention behind its development was to improve the description of children's oral health, while taking into consideration the importance of psychological aspects in the concept of health. The original version was designed using the item impact method, which focuses on items which are of most relevance to respondents. It covers the four domains of oral symptoms, functional limitations, emotional well-being, and social well-being. Because the questionnaire was considered long (at 37 items), shorter forms were developed (with 8 and 16 items) to facilitate its use in both clinical settings and population-based oral health surveys[2]. Two methods were used to produce the short-form versions using data collected during the development of the

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long-form CPQ_{11-14}; these were the item impact and stepwise regression approaches. The item content of the 16--item short-form versions of the CPQ_{11-14} is presented by domain in Table 1.

The developers of the CPQ_{11-14} have determined the psychometric properties of the long-form and the short-forms CPQ_{11-14} to be satisfactory, but stated that these measures must be validated and employed in other cultures, involving clinical and population-based samples of children and adolescents in different countries. The short-form measure has been tested and validated in a representative population sample of schoolchildren in New Zealand[3]. On the other hand, the long-form CPQ_{11-14} has been shown to be valid and reliable in a number of different countries, including Canada[1], the United Kingdom[4,5], New Zealand[6], Uganda[7], Saudi Arabia[8], Australia[9], Brazil[10,11], Hong Kong[12] and Denmark[13]. Only three of these validation studies used a random sample of a school-based population[5.6,9], while the others used convenience samples of children attending dental clinics or of neither the school-based population (Table 2). However, the long-form nor the short-form CPQ_{11-14} has been translated into a Malay (Bahasa Melayu) version and tested in the South-East Asian region.

Table 1. The 16-item short-form version CPQ_{11-14} (ISF version)

In the past 3 months, how often have you … (had/been) … because of your teeth/mouth?

Oral Symptoms	1	Pain in the teeth, lips, jaws or mouth
	2	Mouth sores
	3	Bad breath
	4	Food caught between/in the teeth
Functional Limitations	5	Taken longer than others to eat a meal
	6	Difficult to bite or chew food like apples, corn on the cob or steak
	7	Difficult to say any words
	8	Difficult to drink or eat hot or cold foods
Emotional Well-being	9	Irritable/frustrated
	10	Shy/embarrassed
	11	Concerned with what other people think
	12	Upset
Social Well-being	13	Avoided smiling/laughing when around other children
	14	Argued with other children or your family
	15	Teased/called names by other children
	16	Asked questions about your teeth, lips, jaws or mouth by other children

Table 2. Previous CPQ_{11-14} validation studies

Authors	Country (Language)	Settings (Sampling)	Number of participants	Number of CPQ items
Jokovic *et al* (2002)	Toronto (English)	Clinical (Convenience)	123	37, 16 and 8
Foster Page *et al* (2005)	New Zealand (English)	Population (Random)	430	35, 16 and 8
Robinson *et al* (2005)	Uganda (Lugandan)	Population (Convenience)	174	37
Marshman *et al* (2005)	U.K (English)	Clinical (Convenience)	89	37
Brown and Al-Khayal (2006)	Saudi Arabia (Arabic)	Clinical (Convenience)	134	36
O'Brien *et al* (2006)	U.K (English)	Population (Random)	325	36
Do and Spencer (2008)	Australia (English)	Population (Random)	468	31
Goursand *et al* (2008)	Brazil (Portuguese)	Clinical (Convenience)	160	37
McGrath *et al* (2008)	Hong Kong (Chinese)	Clinical (Convenience)	225	37
Barbosa *et al* (2009)	Brazil (Portuguese)	Population (Convenience)	120	37
Wogelius *et al* (2009)	Denmark (Danish)	Clinical (Convenience)	168	37

The planning of future dental services in Brunei is compromised by a lack of up-to-date information. There is evidence from small scale surveys undertaken in 1999 that the oral health in Brunei of both adults and children is poor. Dental caries is still a major public health problem in Brunei. According to the 1999 oral health survey, only one-tenth of 5-6-year-olds were caries-free; on average, each 12-year-old had nearly 5 permanent teeth that had experienced dental decay (Table 3). The dental health of pre-school children in Brunei has not been documented to the same extent as the dental health of schoolchildren. This is probably because deciduous teeth still are not considered to be as important or as valuable as permanent teeth, and also because the older children may be going to school and are easier to identify and include in oral health surveys.

Table 3. Dental caries status of the population of Brunei Darussalam (1999)

	5-6-year-olds		10-12-year-olds		13-15-year-olds		35-44-year-olds	
	% CF	dmft	% CF	DMFT	% CF	DMFT	% CF	DMFT
Districts								
Brunei-Muara	13.7	7.2	12.7	4.8	7.2	7.0	0.0	15.4
Belait	10.3	7.7	14.0	4.0	4.0	5.0	0.0	14.7
Tutong	9.2	6.8	9.5	3.1	DNA	DNA	0.0	13.2
Temburong	0.0	15.0	3.2	8.1	0.0	9.3	9.7	10.5
Brunei Darussalam	11.3	7.1	12.9	4.8	5.8	7.2	1.7	14.4

CF - Caries-free
dmft- decayed, missing, filled teeth for primary teeth
DMFT- Decayed, Missing, Filled teeth for permanent teeth
DNA - Data not available

The objectives of this study were to develop a Malay version of the CPQ_{11-14} and to determine its construct and discriminative validity by assessing its ability to distinguish between schoolchildren with and without dental caries and malocclusion.

Methods

Ethical approval was granted by the Medical and Health Research and Ethics Committee, Brunei Ministry of Health. The sample included 11-14-year-old schoolchildren in the last year of primary school (Year 6). A sample of 569 Year 6 schoolchildren who are either citizens or permanent residents of Brunei was proposed, because this was higher than that used in any previous study. Nine government primary schools in Brunei Zone II were chosen for the study. If the response rate was assumed to be 80%, this would decrease the total sample size to 455 children, which would still be higher than in any previous CPQ studies.

Parents and caregivers of the children in the study sample were mailed (through their class teachers) an information sheet for the parent and the child about the study, together with an enclosed consent form. Both were bilingual. The consent form also sought information on the parent/caregiver's occupation and the child's basic demographic characteristics (age at last birthday, gender and ethnicity).

Household socioeconomic status (SES) was then determined using the Malaysia Standard Classification of Occupations (2008)[14]. Information on income or level of education was not collected because it was considered that this might discourage parents' participation. The children's verbal assent was also obtained before the clinical examination.

Confidentiality of the participants was strictly maintained. A unique identification number was assigned to each child and all data analyses used that number only.

Prior to data collection, the examiner underwent two calibration sessions with Dr Lyndie Foster Page (LFP) at the University of Otago Faculty of Dentistry and George Street Normal School on the 17th and 19th of February 2010, respectively. This involved examining 5 orthodontic models and 6 schoolchildren, and then computing intraclass correlation coefficients (ICC) to check on inter-examiner reliability.

Questionnaire

A Malay version of the short-form CPQ_{11-14} was derived through a forward-backward translation process (Figure 1). The questionnaire was then piloted on 20 schoolchildren on 24 March 2010 (2 weeks before the actual field survey commenced) and refined for ease of use. This study used the item-impact-derived short-form version of the CPQ_{11-14}[2]. This had 18 items: 2 global ratings about oral health and oral health-related well-being; 4 questions on oral symptoms; 4 questions on functional limitations; 4 questions on emotional well-being; and 4 questions on social well-being. The responses are scored as follows: for the global rating of oral health, (0) excellent, (1) very good, (2) good, (3) acceptable, and (4) bad; for overall well-being, (0) not at all, (1) very little, (2) some, (3) a lot, and (4) very much; and for the remaining 16 questions, (0) never, (1) once or twice, (2) sometimes, (3) often, and (4) every day or almost every day.

Each child completed the CPQ_{11-14} in the dental clinic waiting room just prior to the dental examination. This was done in small groups, in order to reduce time. The translated CPQ_{11-14} was self-administered to avoid interviewer bias. However, the research assistant was available whenever the children needed help in answering the questions, and he would make sure that children answered the questionnaire without communicating with each other, and that all questions were answered prior to the dental examination.

Clinical examination

The clinical examinations were conducted by a single examiner (ARM), at each school; children were examined on site using the school dental clinic. A dental caries examination following WHO guidelines (WHO, 1997)[15] was carried out prior to the assessment for malocclusion. The teeth were examined wet and were not cleaned prior to examination. A disposable dental mirror was used to visually inspect the teeth. The orthodontic assessment was carried out using the Dental Aesthetic Index (DAI)[16], which assesses the relative social acceptability of dental appearance by collecting and weighting data on 10 intraoral measurements. A disposable plastic millimetre ruler was used to measure the deviations (in millimetres) before they were recorded. Dental caries experience was recorded following WHO guidelines (WHO, 1997). The teeth were examined wet and were not cleaned prior to examination. A disposable dental mirror was used to visually inspect the teeth. For

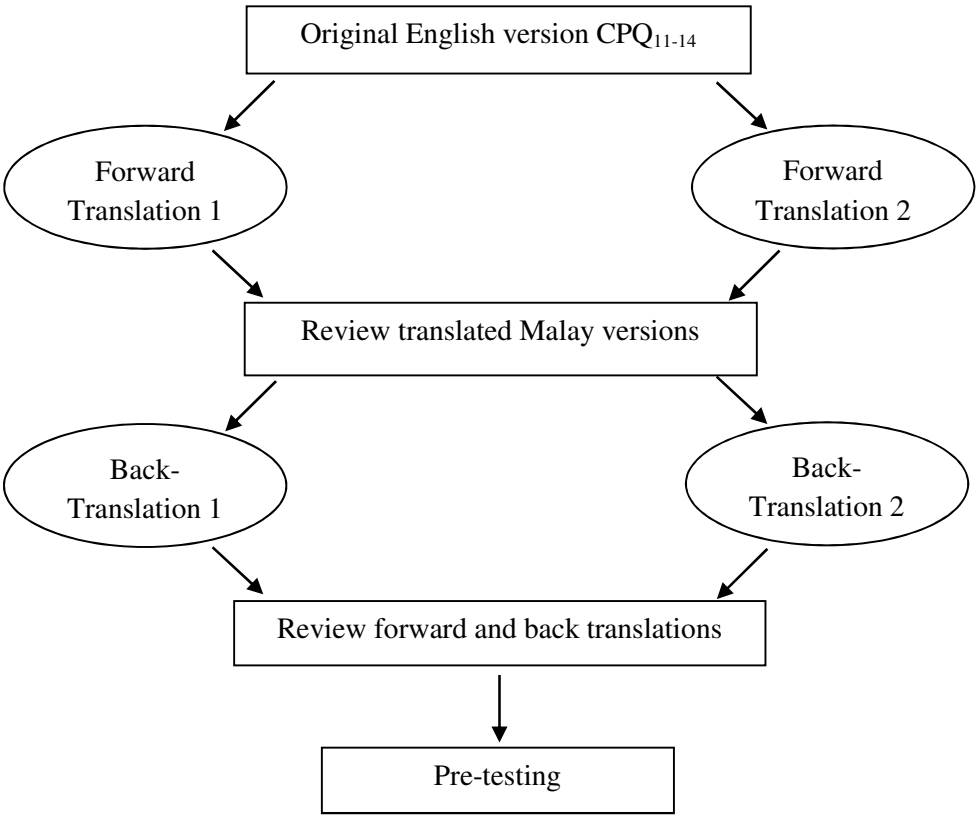

Figure 1 Flow chart of the cross-cultural adaptation of the CPQ_{11-14} into a Malay version

each tooth, its presence or absence was noted, after which the dental caries status of each surface was determined and recorded.

Prior to the data collection, the examiner underwent two calibration sessions with Dr. Lyndie Foster Page (LFP) at the University of Otago School of Dentistry and George Street Normal School on the 17th and19th of February 2010, respectively. This involved examining 5 orthodontic models and 6 schoolchildren, and then computing intraclass correlation coefficients (ICC) to check on inter-examiner reliability. These were 0.99 for the number of decayed, missing or filled surfaces (DMFS), and 0.98 for mean Dental Aesthetic Index (DAI) scores, indicating very good agreement.

Data analysis

The collected dataset was analysed using the statistical package SPSS for Windows, Version 17.0 (SPSS Inc, Chicago, USA). Following descriptive analyses (sample description, caries prevalence and severity, and malocclusion prevalence), bivariate analyses used Chi-square tests or analysis of variance(ANOVA), as appropriate, to test the statistical significance of observed differences.

CPQ_{11-14} scores were computed in two ways: first, scale (and subscale) scores were obtained by summing response scores; second, the prevalence of one or more impacts was determined by counting the number of 'often' and 'every day or almost every day' responses and then dichotomising that variable to indicate those with one or more impacts. The psychometric properties of the Malay short-form CPQ_{11-14} were evaluated in terms of its discriminant validity and construct validity. Discriminant validity was assessed by comparing mean scores by caries experience and malocclusion treatment need categories. Because the CPQ_{11-14} scores were approximately normally distributed, ANOVA was used to assess the associations between mean scale scores and the clinical characteristics (with one-way ANOVA used where the independent variable had more than two categories). Construct validity was assessed by examining associations between the CPQ_{11-14} mean scores (and impact prevalence) and the responses to the two global questions of oral health and overall well-being. The difference was considered to be statistically significant when the *p* value was smaller than 0.05.

Test-retest reliability was assessed by readministering the questionnaires to a subgroup of children (n = 48). In each dental examination session, the research assistant selected 3-5 students to complete a second copy of the questionnaire and for clinical re-examination, without informing the examiner. The research assistant was instructed to allow a time difference (not very specific but usually near the end of the examination session) between the first and second examination. ICCs were then computed.

Results

A total of 457 children (mean age of 11.1 years; range = 10 to 14 years) were examined, giving an effective participation rate of 80.3% (Table 4). The sample's ethnic composition was fairly homogeneous, comprising 95.0% Malay, 1.3% Chinese, and 3.7% Others.

The prevalence of dental caries in the deciduous and permanent dentition was 34.6% and 44.4% respectively. The mean dmfs and DMFS of deciduous and permanent dentitions were 1.5 (SD, 3.3) and 2.0 (SD, 3.7) respectively. About one-fifth had 4 decayed surfaces in either dentition. The DAI scores ranged from 17 to 91, with a mean of 31.4 (SD, 8.7). The distribution of participants across the four treatment need categories was: minor/none, 24.1%; definite, 37.0%; and severe/handicapping, 38.9%.

Cronbach's alpha coefficient for the Malay CPQ_{11-14}-ISF16 was 0.97. CPQ_{11-14} data are presented in Table 5 by clinical characteristics. The differences in mean CPQ_{11-14} were not statistically significant, with the only exception being impact prevalence across the categorised numbers of untreated decayed surfaces. There was a descending gradient across ascending categories of orthodontic treatment need, whereby those in the 'Severe/Handicapping' category had the lowest (and those in the 'Minor/none' category the highest) mean CPQ_{11-14} score and impact prevalence. The construct validity of the CPQ_{11-14} data was assessed by correlating the number of impacts and mean CPQ_{11-14} score with the responses to the global

Table 4. Sociodemographic characteristics of the sample (*n* = 457)

		Sex		
	Total	Male	Female	*P* value[a]
	n (%)	*n* (%)	*n* (%)	
Age group				
10 to 11	387 (84.7)	178 (46.0)	209 (54.0)	0.031
12 to 14	70 (15.3)	42 (60.0)	28 (40.0)	
SES				
High	95 (20.8)	44 (46.3)	51 (53.7)	0.528
Medium	228 (49.9)	106 (46.5)	122 (53.5)	
Low	134 (29.3)	70 (52.2)	64 (47.8)	
Total	457 (100.0)	220 (48.1)	237 (51.9)	

[a] Chi-square test

Table 5. CPQ_{11-14} mean scores and impact prevalence ('often' to 'every day'), by clinical characteristics (*n* = 457)

	Mean CPQ_{11-14}		Impact prevalence	
	Mean (SD)	*P* value	*n* (%)	*P* value[a]
Deciduous dentition				
0 dmfs	16.3 (8.7)	0.099[b]	124 (41.5)	0.081
1+ dmfs	17.7 (8.7)		79 (50.0)	
Permanent dentition				
0 DMFS	16.7 (8.7)	0.773[b]	104 (40.9)	0.094
1+ DMFS	16.9 (8.7)		99 (48.8)	
Number of untreated decayed surfaces present in either dentition				
None	16.2 (8.6)	0.237[c]	97 (38.5)	0.017
1-3	17.4 (8.9)		59 (50.4)	
4+	17.8 (8.8)		47 (53.4)	
DAI treatment need category				
Minor/None	17.5 (9.0)	0.909[c]	54 (49.1)	0.713
Definite	17.0 (8.9)		73 (43.2)	
Severe/Handicapping	16.2 (8.4)		76 (42.7)	
Total	16.8 (8.7)		203 (44.4)	

[a] Chi-square test [b] Independent samples *t* test [c] One-way ANOVA

oral health ratings and the effect of the oral condition on everyday life (Table 6). Both global ratings were significantly associated with mean CPQ_{11-14} score. The mean CPQ_{11-14} scores showed a consistent gradient across the categories of self-reported oral health. The score gradients across the categories of self-rated oral health were almost similar in magnitude to those observed across the categories of the impact of oral health on QoL, with the only exception being the mean score for those who responded 'very much', which was lower than expected. The Malay short-form CPQ_{11-14} had excellent test-retest reliability, as represented by an ICC of 0.94.

Discussion

The short-form CPQ_{11-14} has previously been developed and tested in a clinical convenience sample of children in Canada[2] and in a population-based sample of schoolchildren in New Zealand[3]. This study aimed to produce a Malay version of the 16-item short-form CPQ_{11-14}, and to evaluate its validity and reliability in a sample of schoolchildren in Brunei. Overall, the Malay version of the short-form CPQ_{11-14} showed acceptable construct validity, excellent test-retest reliability but demonstrated moderate discriminative validity. Before discussing the findings, it is appropriate to consider the study's weaknesses and strengths. As with many studies of this type, the

Table 6. CPQ_{11-14} mean scores and impact prevalence ('often' to 'every day'), by global questions (*n* = 457)

	Mean CPQ_{11-14}		Impact prevalence	
	Mean (SD)	*P* value[a]	*n* (%)	*P* value[b]
Self-rated oral health				
Excellent	15.5 (7.4)	<0.0001	22 (44.9)	0.002
Very good	16.6 (8.9)		40 (39.2)	
Good	15.7 (8.5)		62 (38.0)	
Fair	18.1 (8.6)		72 (52.9)	
Poor	29.3 (8.7)		7 (100.0)	
Impact on quality of life				
Not at all	13.8 (8.3)	<0.0001	42 (35.9)	0.034
Very little	16.4 (9.1)		35 (46.1)	
Some	18.3 (7.7)		87 (48.1)	
A lot	19.7 (9.7)		35 (53.8)	
Very much	12.4 (8.6)		4 (22.2)	
Total	16.8 (8.7)		203 (44.4)	

[a] One-way ANOVA [b] Chi-square

participants were a convenience sample of schoolchildren and not a random sample, making generalisation of the findings somewhat problematic. However, this is of secondary importance in the validation of a scale, where sampling should be more purposive and related to the needs of each element of the validation process[17]. In other words, the primary aim of this work was to examine the validity of the CPQ_{11-14} rather than to obtain population estimates of the impact of oral conditions among young adolescents. On the other hand, a strength of the study is its high participation rate of 80.3%, which is higher than those obtained in other previous population-based studies on epidemiological validation of the CPQ_{11-14}. Other strengths of the study were (1) that the short-form version was administered to children prior to their being clinically examined (so that they were unaware of their clinical oral status), and (2) the comprehensiveness of the data collection (with caries data collected at surface level rather than tooth level) with examinations conducted under acceptable conditions by a calibrated examiner.

The CPQ_{11-14} showed moderate discriminant validity for dental caries, despite the sample being a general sample rather than children with a specific oral condition. Although not statistically significant, the observed caries-CPQ_{11-14} gradients in both dentitions provided some evidence to suggest that the scores were associated with the severity of this clinical condition in an expected direction. There was an ascending gradient in mean CPQ_{11-14} score and impact prevalence across categories of the number of untreated decayed surfaces in either dentition (Table 5), suggesting that the CPQ_{11-14} was capable of discriminating among children with different caries experience. That the difference among groups was not statistically significant may be due to the low disease levels in the sample. However, there was a significant association between impact prevalence and the number of decayed tooth surfaces in either dentition, indicating greater child impact with more extensive untreated decay. Thus, caries can cause pain and discomfort as well as wider problems for the child (and perhaps his/her family). Interestingly, these impacts occurred in children who have excellent access to School Dental Services. It may be that this measure is very sensitive or that the novelty of research in these schoolchildren heightened the children's awareness of their mouths. The data provide evidence of some need for dental care among these schoolchildren. Earlier validation of approach to compare impacts among children attending different clinics[2]. They found that the mean score for children with 10 or more decayed tooth surfaces was higher than for those with fewer, although the difference was not statistically significant. Another study, of a general population sample in New Zealand, could detect significant differences only among groups with high caries experience[3].

Where malocclusion is concerned, it was hypothesised that children with more severe malocclusion would have higher scores. However, this was certainly not the case in the present study, with the gradient demonstrated across categories of orthodontic treatment need in the opposite direction, whereby those in the 'severe/handicapping'

category had the lowest and those in the 'minor/none' category had the highest mean CPQ_{11-14} score. Malocclusion is as much a social phenomenon as an anatomical one, and the DAI was designed specifically to assess the relative social acceptability of dental appearance based upon public perceptions of dental aesthetics. It is surprising that descending gradients were observed (across the ascending DAI treatment-need categories), since being 'teased' or 'avoiding smiling or laughing' (social well-being) and 'being upset' or 'worrying about being different' (emotional well-being) are known to be associated with malocclusion, and are important motivating factors in the uptake of orthodontic treatment[18]. The present study's finding is in contrast to those by Foster Page *et al* (2005)[6], in which there was a distinct ascending gradient in mean CPQ_{11-14} scores across the categories of malocclusion severity. Such a gradient was also observed with respect to the emotional well-being and social well-being domain scores, but not with the other domains. There were some minor differences from the current study in the distribution of participants across the four treatment need categories. For example, in that New Zealand study[6], 39.5% were classified as 'minor/none' and 28.4% as 'severe/handicapping'; in the current study, those were 24.1% and 38.9% respectively. The Canadian study found significant differences within the orthodontic patient group, whereby those with a Class II Division I occlusion had higher mean scores than those with Class I occlusion[2]. There are two ways in which the lack of a marked difference in OHRQoL by malocclusion treatment need category in the current study may be explained. First, it could be due to cultural differences, in that the psychosocial characteristics of the children in Brunei are very different from those in Toronto and New Zealand. The children in Brunei may be more accepting of their oral condition, such that oral problems would not hinder their social life as much as those in Western cultures. Second, the findings can also be interpreted in terms of contemporary models of health outcomes. The model of Wilson and Cleary (1995)[19] indicates that health outcomes experienced by an individual are determined not only by the nature and severity of the disease/disorder, but also by personal and environmental characteristics. Locker (1997)[20] suggested that health problems may affect OHRQoL, but such a consequence is not inevitable, and that people with chronic disabling disorders often perceive their OHRQoL as being better than healthy individuals might; that is, poor health or the presence of disease does not inevitably mean poor OHRQoL. This leads to the conclusion that, although Bruneian children with severe/handicapping malocclusion may encounter more challenges in life, their overall OHRQoL is no different from that of children with no malocclusion (or a very minor one). Alternatively, it may mean that the short-form CPQ_{11-14} is not the appropriate instrument for detecting such clinical differences.

Is the short-form CPQ_{11-14} a valid measure?

The current study findings suggest that the Malay short-form CPQ_{11-14} shows some promise for measuring OHRQoL in 11-14-year-old Bruneian children. The Malay short-form CPQ_{11-14} demonstrated good construct validity, since it was

significantly associated with global ratings of the children's oral health and overall well-being in the hypothesised direction; that is, the mean scale scores were expected to be higher among those who report poor OHRQoL on the global measure, and they were indeed higher, with a consistent gradient across the categories of self-reported oral health. This consistent gradient is an interesting and strong finding because, rather than merely observing a difference in CPQ_{11-14} scores between the worst off and the rest of the population, there were appropriate gradients in the aforementioned associations, therefore highlighting the close relationship between OHRQoL and self-reported oral health. The score gradients across the categories of self-rated oral health were almost similar in magnitude to those observed across the categories of the impact of oral health on QoL, with the only exception being the mean score for those who responded 'very much'; this was lower than expected instead of being the highest. This was also shown in a study by Foster Page *et al* (2008)[3]: the mean CPQ_{11-14} score for those who responded 'very much' was lower than those who responded 'a lot' (Figure 2). This may simply be so because it can be semantically difficult to distinguish between 'a lot' and 'very much'; moreover, this may be unique to the Brunei and New Zealand samples, or it may be due to the translation process. It is currently not possible to tell. The validity finding is in agreement with earlier

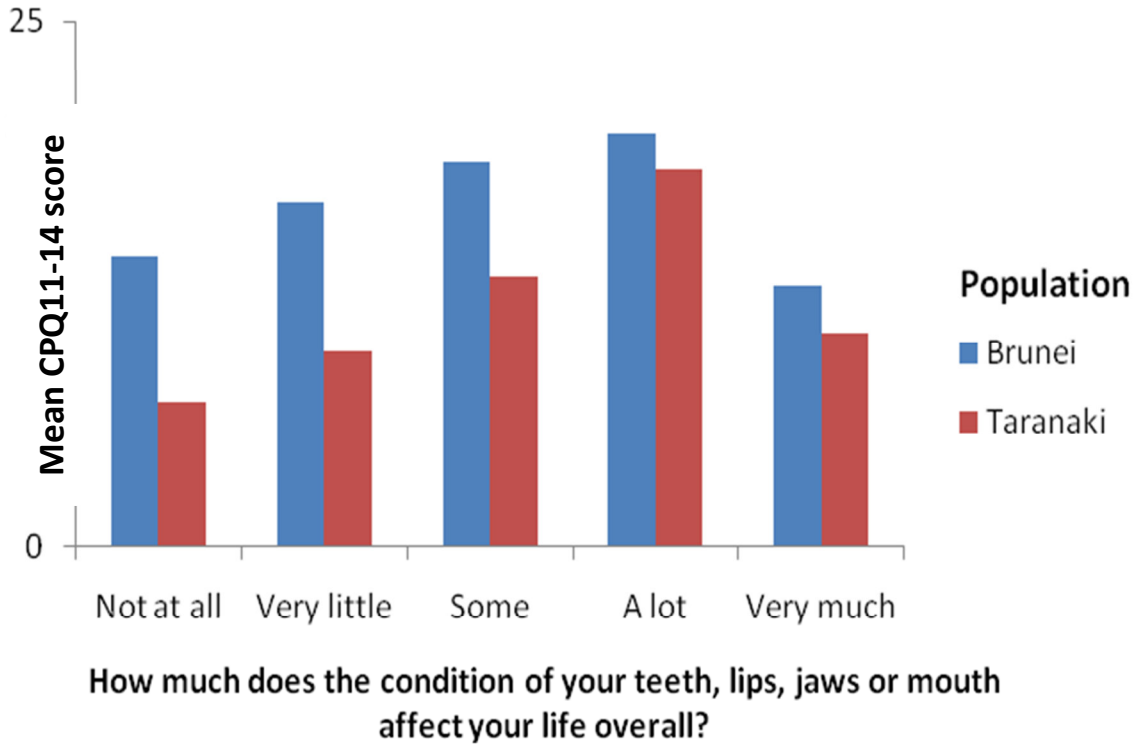

Figure 2. Mean CPQ_{11-14} scores by categories of the impact of OH on quality of life

short-form findings by Jokovic *et al* (2006)[2] and Foster Page *et al* (2008)[3]. Both studies demonstrated positive and significant associations with both global questions, so the smaller number of items in the 16-item did not diminish the measure's construct validity. The differences observed with the global questions showed that the items in the questionnaires address issues and concerns that go beyond oral health, are of sufficient magnitude to have some effect on life as a whole[21], and are present regardless of whether it is being studied clinically or at a population level. In the present study, mean CPQ_{11-14} score differences were greater for 'self-rated oral health' than for 'impact on quality of life', which is similar to the findings by Foster Page *et al* (2008)[3], but opposite to what was reported in the study by Jokovic *et al* (2006)[2]. This may reflect the global rating of oral health being closer to the construct of OHRQoL than the global rating of overall well-being in the present study.

Is the short-form CPQ_{11-14} a reliable measure?

The Malay short-form CPQ_{11-14} also seems to be a reliable instrument for measuring OHRQoL in 11-14-year-old Bruneian children. The assessment of test-retest reliability for the Malay translation showed that it was excellent; the ICC of 0.94 was greater than that for the original short-forms (0.77)[2]. Test-retest reliability was not assessed in the New Zealand study[3]. The ICC value obtained in the present study was also higher than those values obtained in any validation of the full-length version of the CPQ_{11-14}: 0.90 in Canada[1], 0.83 in the U.K[4], 0.65 in Saudi Arabia[8], 0.85 in Brazil[10] and 0.88 in Hong Kong[12].

These are preliminary findings based on a survey of a convenience sample, and they may not be generalisable to all children in Brunei. This means that the study needs to be repeated on different samples recruited from different locations in order to confirm the psychometric properties of the Malay short-form CPQ_{11-14}. Research is required to examine its sensitivity to change using a prospective study design. Following that, the psychometric properties of the Malay short-form CPQ_{11-14} would have been fully evaluated, thus also determining whether it could be useful for clinical trials and in clinical practice as an evaluative measure.

In conclusion, the Malay short-form CPQ_{11-14} shows some promise as a measure of OHRQoL among Bruneian children, but its association with clinical conditions requires further investigation.

Acknowledgments

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