

Prevalence of oral impacts and validity of the Child-Oral Impacts on Daily Performance (OIDP): pilot study of 10-11 year-old children in Italy

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Abstract

Aim: The Child-Oral Impacts on Daily Performance (OIDP) assesses the impacts of oral health problems on the daily activities of children. Objectives of this study were to cross-culturally adapt the Child-OIDP for use among Italian children and provide initial evidence on its reliability and validity in a sample of 10-11 year-olds.

Materials and Method: The Italian Child-OIDP was administered to a convenience sample of 10-11-year-old 5th graders of "Giò Leonardo di Bona" Public School in Cutro (Italy). Informed positive consent was sought and obtained from the participants' parents. Analyses were performed using SAS statistical package; reliability testing referred to internal consistency that was evaluated using the Cronbach's alpha, alpha if item deleted, and inter-item and item-total correlation coefficients.

Result: To provide initial evidence for the evaluation of the psychometric properties of the Italian Child-OIDP, we invited 103 10-11-year-old schoolchildren and 97 participated in the study (response rate = 94.2%), 50 boys (51.5%) and 47 girls (48.5%). Almost all children (95.87%) reported that they had experienced at least one problem with their teeth or mouth in the past 3 months. All item-total correlation were above 0.20 and Cronbach's alpha was 0.59. Higher Child-OIDP scores were significantly associated with worse perceptions in terms of oral health, general health and satisfaction with oral health status, but not with perceived dental treatment needs. Analyses were performed using SAS statistical package; reliability testing referred to internal consistency that was evaluated using the Cronbach's alpha, alpha if item deleted, and inter-item and item-total correlation coefficients.

Conclusion: Child-OIDP index is a measure of oral health-related quality of life that can be applied to Italian children. Initial evidence of its psychometric properties was promising, but future studies should be conducted to fully evaluate its psychometric properties in a population based epidemiological study.

Keywords: Public health, oral health programs, Child health-related quality

1. Introduction

Based on the World Health Organization (WHO) definition of health [1], measuring health should not be confined to the use of exclusively clinical normative indicators. Health-related quality of life (HRQoL) measures are being used nowadays to evaluate dimensions of health, such as psychological and social aspects, that are not assessed by other measures [1,2].

HRQoL measures can be categorized as generic or specific.

The generic measures are used to evaluate the impact of general health problems on quality of life. The specific measures focus on the repercussions of particular health conditions, problems or treatments on the quality of life. HRQoL indices have a specific application in the evaluation of the impacts of oral problems on daily activities. These indices are widely used for adults or

elderly populations, but relatively fewer studies have been conducted on child populations. However, children are subject to numerous oral conditions that can impact on their HRQoL and they are the prime target group of oral healthcare services in many countries [3]. Children represent the major focus of dental public health research and practice. Therefore, oral health-related quality of life (OHRQoL) measures applicable to the child population are essential and this has been recently recognised. Complex conceptual and methodological issues are involved in the construction of indicators for children, as such indicators have to take into account distinct changes in the growing child [2,3].

One of the measures developed specifically for children is the Child Oral Impacts on Daily Performances (Child-OIDP) index [1]. The Child-OIDP assesses the impacts of oral health problems on the daily activities of children. As such, it has public health applications for the assessment of oral health needs and can be a valuable indicator for the evaluation of oral health programs [1,7].

The psychometric properties of the Child-OIDP have been successfully assessed in several countries with different cultures and languages, such as Thai, French, English, Spanish and Kiswahili[2,3,4,5,6,8]. The availability of multi-lingual versions of instruments is important for comparative epidemiological research.

The objectives of this study were to cross-culturally adapt the Child-OIDP for use among Italian children and provide initial evidence on its reliability and validity in a sample of 10-11 year-olds.

2. Material and Methods

The Italian Child-OIDP was administered to a convenience sample of 10-11-year-old 5th graders of “Giò Leonardo di Bona” Public School in Cutro (Italy). Informed positive consent was sought and obtained from the participants’ parents.

For the application of the Child-OIDP the children were initially asked to record all oral health related problems they have experienced in the past three months (Table 1). Then, data were collected on the impacts of oral problems considering eight common daily performances: eating, speaking, cleaning mouth, relaxing (including sleeping), emotional status, smiling, studying and social contact (Table 2). In the event that a child reported an oral impact on a daily performance, the child responded to questions about the frequency and severity of the specific impact; a score from 0 to 3 is given to rate each of these characteristics [1]. When no impact was reported, the child received a score of “0”, while “1” indicated minor impact, “2” moderate and “3” severe impact. The methods used to translate the

questions in the Child-OIDP index to Italian and to adapt the index to the Italian culture followed published guidelines [9]. The process of cross-cultural adaptation was conducted in Rome and involved several steps: translation from English to Italian; first meeting of the expert panel to produce the first Italian version; pilot-testing in a focus group of children; second meeting of the expert panel to produce a new consensus version. Then, to test the cross-cultural adaptation, the Italian consensus version of the index was back-translated to English by two independent native English-speaking professional translators. The index was then re-evaluated for adequacy by the members of the expert panel and by authors of the original English version of the Child-OIDP.

Table 1. Child-OIDP index: list of conditions and modifications from the original questionnaire (changes are in *italics*).

List of problems: original Child-OIDP	List of problems: Italian Child-OIDP (translated)
Toothache	Sensitive teeth (<i>when you eat or drink: sweets, hot food such as milk and cold food such as ice cream</i>)
Tooth decay, hole in tooth	Tooth decay, hole in tooth
Exfoliating primary tooth	<i>Mobile milk teeth</i>
Tooth space(due to an non-erupted permanent tooth)	Tooth space(due to an non-erupted permanent tooth)
Fractured permanent tooth	<i>Broken permanent tooth</i>
Colour of tooth	Colour of tooth (<i>darker or more yellow in colour</i>)
Shape or size of tooth	Shape or size of tooth (<i>abnormally sized or shaped tooth, or larger or smaller than the other teeth</i>)
Position of tooth (e.g. crooked or projecting, gap)	<i>Tooth position (crowded, crooked, separated, or protruding teeth)</i>
Bleeding gum	<i>Bleeding of the gums (when brushing teeth)</i>
Swollen gum	<i>Swollen gums (inflamed or very red gums)</i>
Calculus	<i>Tartar</i>
Oral ulcers	<i>Oral wounds</i>
Bad breath	Bad breath
Erupting permanent tooth	Erupting permanent tooth
Missing permanent tooth	<i>Missing, lost, or extracted permanent tooth</i>
Others (specify)	<i>Others. Which?</i>

* The document in original language can be requested to the referring author

All interviews were conducted by the same trained researcher. The first question (recording common oral health problems) was administered in the classroom and children answered the question individually, without communicating with each other. For the main part (oral impacts) the Child-OIDP was administered in individual

face-to-face interviews. Questions on self-rated oral and general health were included too, in order to facilitate the initial assessment of validity of the Italian Child-OIDP.

Analyses were performed using SAS statistical package; reliability testing referred to internal consistency that was evaluated using the Cronbach's alpha, alpha if item deleted, and inter-item and item-total correlation coefficients.

Kruskal–Wallis one-way analysis of variance by ranks is a non-parametric method for testing whether samples originate from the same distribution. It is used for comparing more than two samples that are independent, or not related.

Table 2. Child-OIDP index: items and modifications from the original questionnaire (changes are in italics).

Original Child-OIDP items	Italian Child-OIDP items (translated)
Eating food (e.g. meal, ice-cream)	Eating food (e.g. meal, ice-cream)
Speaking clearly	Speaking clearly
Cleaning your mouth (e.g. rinsing your mouth, brushing your teeth)	Cleaning your mouth (e.g. rinsing your mouth, brushing your teeth)
Relaxing (including sleeping)	<i>Sleeping</i>
Maintaining your usual emotional state without being irritable	Maintaining your emotional state (<i>mood</i>) without <i>becoming irritated or stressed</i>
Smiling, laughing and showing your teeth without embarrassment	Smiling, laughing and showing your teeth without embarrassment
Carrying out your schoolwork (e.g. going to school, learning in class, doing homework)	Carrying out your schoolwork (e.g. going to school, learning in class, doing homework)
Contact with people (e.g. going out with friend, going to a friend's house)	Contact with people (e.g. going out with friend, going to a friend's house)

* The document in original language can be requested to the referring author

3. Results

To accomplish an accurate cross-cultural adaptation of the Child-OIDP into Italian, some words were modified from the original version (Tables 1 and 2). The modifications did not affect the content of the index but aimed to facilitate comprehension and ease of administration in the culturally specific context. Minor modifications were made collectively by the expert panel,

Table 3. Prevalence of perceived oral problems in 10-11 year old Italian children (n = 97).

Oral problems	Children with the problem %
Tooth decay, hole in tooth	47.4
Toothache	45.4
Bleeding gum	43.3
Sensitive tooth	34.0
Exfoliating primary tooth	31.9
Position of tooth (e.g. crooked or projecting, gap)	25.7
Bad breath	24.7
Tooth space (due to an non-erupted permanent tooth)	22.7
Erupting permanent tooth	18.5
Swollen gum	13.4
Colour of tooth	12.4
Shape or size of tooth	9.3
Calculus	9.3
Fractured permanent tooth	4.1
Missing permanent tooth	2.0
Oral ulcers	1.0
Others (specify)	1.0
At least one oral problem	95.87

using notes and data obtained in the pilot testing. Besides, examples were included, in order to make the content more specific and facilitate understanding. One of the performances was modified from “relaxing (including sleeping)” to “sleeping”, since it was observed in the pilot testing that the children had comprehension difficulties with the term “relaxing”. To provide initial evidence for the evaluation of the psychometric properties of the Italian Child-OIDP, we invited 103 10-11-year-old schoolchildren and 97 participated in the study (response rate = 94.2%), 50 boys (51.5%) and 47 girls (48.5%). Almost all children (95.87%) reported that they had experienced at least one problem with their teeth or mouth in the past 3 months. The most prevalent oral problems were tooth decay (47.2%), toothache (45.4%), bleeding gum (43.3%), sensitive tooth (34.0%) and exfoliating primary tooth (31.9%) (Table 3). Overall, 79.4% of the sample reported oral impacts on their daily life. The more prevalent oral impacts were “eating” (50.5%), “cleaning” (49.5%), “emotional status” (19.6%) and “smiling” (13.4%), while the performance with the lowest prevalence was “sleeping” (2.0%) (Table 4). For the evaluation of reliability we have utilized the item-total correlation coefficients, the inter-item correlation and alpha if item deleted. Inter-item correlations ranged between 0.08 and

Table 4. Prevalence of oral impacts on daily performances (Child- OIDP) in 10-11 year old Italian children.

Performances	Percentage of children with impact on performance (n = 97)
Eating	50.5
Cleaning mouth	49.5
Emotional status	19.6
Smiling	13.4
Social contact	9.3
Studying	8.2
Speaking	5.1
Sleeping	2.0
Any Oral Impact	79.4

0.18 and the mean inter-item correlation was 0.15. All item-total correlations were above the 0.20 threshold.

Cronbach's alpha was 0.59 and it was lower when any item was deleted, with the exception of "cleaning" and "sleeping" (Table 5). The relationship between the Child-OIDP score and the self-rated measures demonstrated that children with perceptions of poor oral health had a higher median score of the index (13.89) than children that evaluated their oral health as standard (8.33) and they in turn had lower Child-OIDP score than those that reported that their oral health was good (0.00). Similarly, children who were more satisfied with their oral health had a lower median Child-OIDP score. We had very clear gradients with worse (higher) OHRQoL score for each lower rating of these self-perceived variables. However, there was no association between perceived dental treatment needs and the Child-OIDP score in our sample (Table 6).

4. Discussion

The main contribution of this study was to adapt the Child-OIDP index for Italian children aged 10-11-year-old; this study provided initial evidence in relation to reliability and validity. The methods applied in the cross-cultural adaptation followed guidelines previously used in other validation studies [1,2,3,4,5,6] and assured the equivalence of the original and adapted versions. During this process, some minor word modifications were made to take into account social and cultural differences; however, care was taken to ensure that linguistic equivalence was achieved. As the Child-OIDP index is aimed to be a brief and cost-effective measure with high applicability in public health and needs assessment, it assesses oral impacts in relation to eight independent daily performances [2]. Previous studies have adapted and applied in adolescents sociodental indices developed for adults [11,12]; the present work validates an

instrument specifically constructed for children. The adaptation of an existing validated instrument is preferable to the development of a new one [2,13]. In fact, developing a new instrument can be a complex procedure: the adapted version can be as valid and reliable as the original and the presence of an instrument of reference helps investigations where various countries take part, by allowing for direct comparability of findings. In this pilot study the sample reported high levels of perceived oral problems; besides, eating was the most affected performance in all studies using Child-OIDP in a general population [2,3,4,14]. The Child-OIDP showed good validity results in this study. It was significantly associated and in the expected direction with different subjective oral health measures. According to our results, worse self-ratings of oral health, as well as general health, and lower levels of satisfaction with oral health were associated with higher Child-OIDP scores, indicating worse oral health related quality of life.

Table 5. Item-test correlation coefficients, Interitem correlation and Alpha if item deleted (n=97).

Item	Item-test correlation	Average interitem correlation	Alpha
eating	0.54	0.14	0.53
speaking	0.47	0.15	0.56
cleaning mouth	0.35	0.18	0.6
sleeping	0.34	0.18	0.6
emotional status	0.48	0.15	0.56
smiling	0.49	0.15	0.55
studying	0.48	0.15	0.56
social contact	0.87	0.08	0.38
Test scale	-	0.15	0.587

It is worth considering that these differences followed a stepwise pattern across the categorisations of the various subjective measures, further highlighting the good performance of the Child-OIDP. On the other hand, there were no differences in our sample in the Child-OIDP score between children that perceived dental treatment need and those that did not; this is in contrast to previous studies using the same measure in different child populations [2,3,4,5,6] and it could be due probably to the sample size and the extremely high prevalence of oral impacts in this sample. Initial internal consistency reliability results indicated that all correlations were above the 0.20 threshold [1,3,7,14,17].

The value of alpha was lower than the 0.70 threshold [1,3,7,14,17] but above the 0.50 value suggested for initial evaluation stages [1,3,7,14,17], and not very different from the respective value observed in other

Table 6. Construct Validity: Child-OIDP score and self-rated measures of oral health (n=97)*.

Self-rated oral health		Child-OIDP Score			
Measures	Median	Mean (SD)	25 th Centile	75 th Centile	p value
Perceived oral health					
1.Poor (n = 9)	13.88	15.58 (3.52)	13.19	17.36	0.0001
2.Regular (n = 58)	8.33	7.32 (4.16)	4.17	8.68	
3.Good (n = 30)	0.00	1.01 (1.58)	0.00	1.74	
Satisfaction with oral health					
1.Not at all (n = 21)	12.5	12.63 (4.66)	8.33	14.58	0.0001
2.Regular (n = 51)	5.55	5.99 (3.80)	2.78	8.33	
3.Very satisfied (n = 25)	0.00	1.00 (2.28)	0.00	0.69	
Perceived dental treatment					
1.Yes (n = 60)	3.47	5.11 (4.52)	1.39	8.33	0.2673
3.No (n = 22)	6.94	7.95 (7.42)	0.00	13.89	
Self-rated general health					
1.Poor (n = 3)	13.88	14.35 (9.03)	5.56	23.61	0.0001
2.Regular (n = 21)	8.33	10.78 (4.54)	8.33	13.89	
3.Good (n = 73)	2.77	4.47 (4.40)	0.00	8.33	

* Kruskal-Wallis test for association between Child-OIDP and oral health measure.

relevant studies. Despite its importance, the limitations of Cronbach's alpha have been extensively discussed in both the general and oral health related quality of life literature [1,3,7,14,17] both in terms of its appropriateness for indicators that focus on activities of daily living and also for its dependence on the length of the measure, with longer questionnaires showing higher alpha scores.

This study benefited from an excellent response rate but it also has some important limitations. We used a convenience and rather small sample, therefore cannot generalise our results to the wider population of Italian schoolchildren of that age. Furthermore, the sample was recruited entirely from a public school; it is unclear whether the results would be replicated in a sample of children attending private schools. Finally, for practical

of the Child-OIDP; this should be done in a future study.

4. Conclusion

It can be concluded that the Child-OIDP index is a measure of oral health-related quality of life that can be applied to Italian children. Initial evidence of its psychometric properties was promising, but future studies should be conducted to fully evaluate its psychometric properties in a population based epidemiological study. The index can also be used to assess the relationship of oral impacts and quality of life with clinical dental status and contribute to assessing the dental treatment needs of children [2,15,16,17].

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