

## An Indonesian Version of Child Oral Impact on Daily Performances (C-OIDP): Assessing Validity and Reliability

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### Abstract

The aim of this study was to assess the validity and reliability of an Indonesian version of the Child Oral Impacts on Daily Performances (C-OIDP) among 12–15-year-old junior high school children in Jakarta.

The Indonesian C-OIDP was developed according to the guidelines for the cross-cultural adaptation process. It was tested for reliability and validity on a random sample of 502 12–15-year-old school children in Jakarta. The psychometric analysis of the Indonesian C-OIDP involved convergent and discriminant validity tests as well as test-retest and internal reliability.

The mean age of the participants was 13.3±0.9, with 54% were females. Cronbach's alpha value was 0.72. In terms of test-retest reliability, the intra-class correlation coefficient was 0.61. Two-thirds (64.9%) of the sample had at least one oral impact affecting one or more performances in the past three months. The mean of the C-OIDP score was 3.49±5.61. The convergent validity was confirmed by the C-OIDP scores as being significantly associated with oral health conditions.

This study indicated that the Indonesian C-OIDP index is valid and reliable for use as an oral health-related quality of life index among 12–15-year-old children in Indonesia.

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### Introduction

Oral health can have a strong impact on an individual's general health, significantly affecting their quality of life and ability to socialize.<sup>1</sup> This perception are influenced by experiences, environment, and their levels of education.<sup>2</sup> Many instruments can be used to assess OHRQoL, such as the Child Perception Questionnaire (CPQ), Early Childhood Oral Health Impact Scale (ECOHIS), Child Oral Health Impact Profile (COHIP), Scale of Oral Health Outcomes (SOHO), and Pediatric Oral health-related Quality of Life (POQL).<sup>3-6</sup> Unfortunately, studies on instruments able to effectively measure OHRQoL in Indonesia are still rare.<sup>7</sup>

This study aimed to further investigate the relationship between oral health and an individual's quality of life. This study addressed

the need to assess OHRQoL for children in Indonesia. The C-OIDP was used because it has a wide age range, being effective for both children and young adults. Its questions comprises of eight components used to measure and evaluate the impact of oral health on the ability to perform daily activities based on the frequency and severity of the impact.<sup>8</sup>

### Materials and methods

This study was approved by the Ethics Committee of the Faculty of Dentistry, Universitas Indonesia. It was conducted in 2015 on 12–15-year-olds at six junior high schools in Jakarta. The study was a cross-sectional research design and used a multi-stage random sampling method. Before the study began, the original C-OIDP questionnaire was translated and adapted to Indonesian language. After filling out the C-OIDP questionnaire through online form, each child underwent a clinical oral examination. This was conducted by a trained dentist and used two indexes suggested by the World Health Organization (WHO): the Decay Missing Filling-Teeth (DMF-T) index and the

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PUFA index for caries status evaluation. The PUFA index records the presence of severely decayed teeth with visible pulpal involvement, ulceration caused by dislocated tooth fragments, fistula, and abscess. For the evaluation of gingival and oral hygiene status, the Gingival Index (GI) and Plaque Index (PI) were used. The GI included the following categories: normal gingiva, slightly inflamed gingiva, moderately inflamed gingiva, and severely inflamed gingiva.<sup>9</sup> The PI used the following categories: absence of plaque, plaque evident on probing, plaque can be seen, and accumulation of plaque. The data obtained were then dichotomized into two categories: healthy and non-healthy.<sup>4</sup> Data management and analysis were performed using the software SPSS Statistics 20.

Comparison analysis was conducted to evaluate the discriminant validity. The convergent validity was analyzed using correlation tests. The reliability of the tests was analyzed using two types of tests. The Cronbach's alpha was used to evaluate internal consistency and reliability. The intra-class correlation coefficient (ICC) test was used to determine the reliability of test-retest.

## Results

The response rate was 91.6%. The total number of examined participants, who had parental consent, present on the examination day, willing to participate the study, were 502 adolescents. The mean age of the respondents was 13.3±0.9, with 54% of the students were girls. The socio-demographic distribution of the respondents completing C-OIDP is presented in Table 1. Two-thirds (64.9%) of the sample stated that, during the last three months, their oral condition had been affected by at least 1 out of 8 types of disturbances listed in the questionnaire, disrupting their ability to carry out daily activities. The mean C-OIDP score was 3.5. The mean C-OIDP, DMF-T, PUFA, GI, and PI scores are shown in Table 1.

The test and retest reliability showed an ICC of 0.61. The internal reliability showed that the cronbach's alpha score was 0.72. Table 2 showed the Cronbach's alpha score of each domains. All corrected item total correlations score was positive, and above 0.3. The discriminant validity in this study was evaluated through the comparison of the C-OIDP scores and clinical examination (active decay, positive

Characteristics	n (%)	Mean (SD)
Gender		
Male	231 (46)	
Female	271 (54)	
Age		
12	114 (22.7)	
13	169 (33.7)	
14	179 (35.7)	
15	40 (8.0)	
Father's Education		
Low	52 (10.4)	
Moderate	361 (71.9)	
High	89 (17.7)	
Mother's Education		
Low	92 (18.3)	
Moderate	343 (68.3)	
High	67 (13.3)	
C-OIDP		
Eating (0-9)	168 (33.5)	3.5 (5.6)
Speaking (0-9)	80 (15.9)	0.4 (0.9)
Cleaning teeth (0-9)	201 (40.0)	0.2 (0.7)
Sleeping/relaxing (0-9)	95 (19.1)	0.5 (1.1)
Emotional stability (0-9)	150 (29.9)	0.4 (0.9)
Smiling/showing teeth (0-9)	96 (19.1)	0.4 (1.0)
School activities (0-9)	48 (9.6)	0.3 (0.8)
Social Interaction (0-9)	57 (11.4)	0.1 (0.6)
Impact ≥ 1	326 (64.9)	0.2 (0.6)
Oral Health Status		
DMF-T (0-16.0)	439 (12.5)	4.4 (3.1)
PUFA (0-4.0)	107 (21.3)	0.3 (0.7)
GI (0-2.7)	141 (28.1)	0.8 (0.6)
PI (0-3.0)	168 (33.5)	0.9 (0.6)

**Table 1.** Descriptive statistics of socio-demographic characteristics, C-OIDP, and oral health status of the study participants.

	Corrected item-total correlation	Cronbach's alpha if item deleted
Eating	0.44	0.69
Speaking	0.30	0.72
Cleaning teeth	0.51	0.68
Sleeping/relaxing	0.48	0.68
Emotional stability	0.54	0.67
Smiling/showing teeth	0.32	0.71
School activities	0.39	0.70
Social interaction	0.37	0.71

**Table 2.** The corrected item-total correlation from the eight components and the Cronbach's alpha if item were excluded.

PUFA, oral hygiene, and gingivitis) as seen in Table 3. Children with no-active caries had a lower mean C-OIDP. Children with zero PUFA score had lower C-OIDP score. Children with good oral hygiene (PI < 1) had significant lower C-OIDP score. Also, children without signs of gingivitis (GI < 1) had significant lower C-OIDP score.

	C-OIDP	p-value
Active Caries		
Active (n=438)	257	0.03*
Non (n= 64)	215	
PUFA		
Positive (n=395)	286	0.00*
Negative (n= 107)	242	
Plaque		
Present (n=333)	270	0.00*
Absent (n=169)	242	
Gingivitis		
Positive (n=361)	277	0.01*
Negative (n=141)	242	

**Table 3.** Comparison test of the mean C-OIDP score with clinical conditions.  
 Mann-Whitney U Test; \*p < 0.05

	C-OIDP	
	r	p-value
Active Caries	0.10	0.02*
PUFA	0.14	0.00*
Plaque Index	0.08	0.04*
Gingival Index	0.16	0.01*
Subjective General Health	0.57	0.20
Subjective Oral Health	-0.27	0.01*

**Table 4.** Correlations between C-OIDP score and oral health indicators  
 Spearman correlation test; \*p < 0.05

	Gender (n(%))		p-value
	Male	Female	
C-OIDP impact			
Eating	77 (33)	91 (33)	0.95
Speaking	44 (19)	36 (13)	0.08
Cleaning teeth	96 (41)	105 (39)	0.52
Sleeping/relaxing	43 (19)	53 (19)	0.79
Emotional stability	68 (29)	82 (30)	0.84
Smiling/showing teetht	48 (21)	48 (18)	0.38
School activities	30 (13)	18 (6)	0.02*
Social interaction	37 (16)	20 (7)	0.00*
Prevalence of impact			
Experiences impact	152 (66)	174 (64)	0.71
No impact	79 (34)	97 (36)	

**Table 5.** Analysis of the quality of life by gender  
 Chi Square Test; \*p < 0.05

The convergent validity was further assessed by correlating the total mean scores between the clinical conditions with the C-OIDP scores adjusted by age and gender (Table 4). The results showed that there was a significant correlation between the clinical conditions (active caries, PUFA, plaque, and gingivitis) and the C-OIDP score. The convergence validity was also evaluated using the Spearman correlation test. Table 4 presents the correlation between the C-OIDP scores and the self-scoring on general health. There was significant correlation between the C-OIDP score

and self-scoring on general oral health. The C-OIDP items analysis of the prevalence and intensity of impact based on gender is shown in Table 5.

## Discussion

In approaching the cross-cultural adaptation of the C-OIDP, the relevance and validity of an instrument needs to be examined in the light of the settings of individual countries. The first step is the translating procedure, which should be done according to guides provided by Guillemin et al.<sup>10</sup> This includes translation into a given country's native language, back-translation into the instrument's original language, evaluation by a professional committee. The Indonesian version of C-OIDP shows reliability for use as a survey instrument. None of the domains received a Cronbach's alpha score that exceeded the Cronbach's alpha standard; thus, none of the questions needed to be revised or eliminated from this instrument. The discriminant validity grouped children based on their clinical indicators, which were active caries, PUFA, plaque, and gingivitis. The study showed that children with active caries, positive PUFA, plaque, and gingivitis had a higher mean C-OIDP score. The convergence validity was proven by the negative relationship between the C-OIDP score and self-scoring on general and oral health. This negative relationship showed that participants with higher OHRQoL scores showed lower self-scoring towards their general and oral health.<sup>4,11-13</sup> The two types of validity tests showed a significant correlation and ability to discriminate between good and poor oral health, indicating the validity of the questionnaire.

The C-OIDP scores of the participants indicated relatively high quality of life, comparatively, in previous studies in other countries, the C-OIDP scores were also high<sup>14</sup>; each participant experienced at least one effect due to oral conditions, indicating that oral conditions had an impact on participants' quality of life. Participants' habits regarding eating and cleaning their teeth were most affected by disturbances in oral health. In this study, participants with high DMF-T scores were presumed to have active caries, which affect chewing and biting and cause problems while brushing teeth.<sup>15</sup>

The questionnaire showed that there was a significant correlation between clinical condition and the quality of life of children aged 12–15 years old. In accordance with similar studies in other countries, disturbances while eating and brushing one's teeth were the highest-scored impacts in the Indonesian version of the C-OIDP.<sup>16</sup> Oral health affects the daily performances of children aged 12–15, especially their ability to eat and clean their teeth, which in turn influences their nutrition, growth, and general health. This study used self-administered questionnaire rather than by interviews. This was employed due to the reason that it was reported previously that the oral health literacy in the Indonesia adolescents were relatively sufficient.<sup>17</sup> Based on previous study, the self- and interviewer-administered Child-OIDP had a high level of agreement, irrespectively of whether the overall score or the prevalence of oral impacts was used to describe children's quality of life.<sup>18</sup> Further studies are needed, however, to evaluate the specific effects of oral health.

## Conclusions

From this study, it can be concluded that the Indonesian C-OIDP questionnaire is a valid OHRQoL instrument and can be reliably used on children 12–15 years. This study can be implemented in other areas of Indonesia, besides Jakarta, to assess the quality of life in children.

## References

1. Cohen-Carneiro F, Souza-Santos R, Rebelo MA. Quality of life related to oral health: contribution from social factors. *Cien Saude Colet*. 2011;16:1007-1015.
2. Sanadhya YK, Thakkar JP, Divakar DD, et al. Effectiveness of oral health education on knowledge, attitude, practices and oral hygiene status among 12–15-year-old schoolchildren of fishermen of Kutch district, Gujarat, India. *Int Marit Health*. 2014;65:99-105.
3. Naidoo S, Sheiham A, Tsakos G. The relation between oral impacts on daily performances and perceived clinical oral conditions in primary school children in the Ugu District, Kwazulu Natal, South Africa. *Sadj*. 2013;68:214-218.
4. Nurelhuda NM, Ahmed MF, Trovik TA, Åstrøm AN. Evaluation of oral health-related quality of life among Sudanese schoolchildren using Child-OIDP inventory. *Health Qual Life Outcomes*. 2010;8:152.
5. Naito M, Suzukamo Y, Ito HO, Nakayama T. Development of a Japanese version of the Oral Impacts on Daily Performance (OIDP) scale: a pilot study. *J Oral Sci*. 2007;49:259-264.
6. Gilchrist F, Rodd H, Deery C, Marshman Z. Assessment of the quality of measures of child oral health-related quality of life. *BMC Oral Health*. 2014;14:40.
7. Rachmawati YL, Pratiwi AN, Maharani DA. Cross-cultural Adaptation and Psychometric Properties of the Indonesia Version of the Scale of Oral Health Outcomes for 5-Year-Old Children. *J Int Soc Prev Community Dent*. 2017;7:S75-S81.
8. Bianco A, Fortunato L, Nobile CG, Pavia M. Prevalence and determinants of oral impacts on daily performance: Results from a survey among school children in Italy. *Eur J Public Health*. 2010;20:595-600.
9. Maharani DA, Adiatman M, Rahardjo A, Burnside G, Pine C. An assessment of the impacts of child oral health in Indonesia and associations with self-esteem, school performance and perceived employability. *BMC Oral Health*. 2017;17:65.
10. Sales DS, Alvarenga RM, Vasconcelos CC, Silva RG, Thuler LC. Translation, cross-cultural adaptation and validation of the Portuguese version of the DYMUS questionnaire for the assessment of dysphagia in multiple sclerosis. *Springerplus*. 2013;2:332.
11. Vera C, Moreno X, Rivera D, Oral C. Adaptation and validation of Child Oral Impact on Daily Performance index in 11- 14-year-old Chilean school children. *J Oral Res*. 2013;2:119-124.
12. de Andrade FB, Lebrão ML, Santos JL, da Cruz Teixeira DS, de Oliveira Duarte YA. Relationship between oral health-related quality of life, oral health, socioeconomic, and general health factors in elderly Brazilians. *J Am Geriatr Soc*. 2012;60:1755-1760.
13. Cortés-Martínicorena FJ, Rosel-Gallardo E, Artázcoz-Osés J, Bravo M, Tsakos G. Adaptation and validation for Spain of the child-oral impact on daily performance (C-OIDP) for use with adolescents. *Med Oral Patol Oral Cir Bucal*. 2010;15:e106-11.
14. Krisdapong S, Sheiham A, Tsakos G. Oral health-related quality of life of 12- and 15-year-old Thai children: findings from a national survey. *Community Dent Oral Epidemiol*. 2009;37:509-517.
15. Laganà G, Abazi Y, Beshiri Nastasi E, Vinjollí F, Fabi F, Divizia M, Cozza P. Oral health conditions in an Albanian adolescent population: an epidemiological study. *BMC Oral Health*. 2015;15:67.
16. Krisdapong S, Sheiham A, Tsakos G. Impacts of recurrent aphthous stomatitis on quality of life of 12- and 15-year-old Thai children. *Qual Life Res*. 2012;21:71-76.
17. Rahardjo A, Adinda S, Nasia AA, Adiatman M, Setiawati F, Wimardhani YS, Maharani DA. Oral health literacy in Indonesian adolescent. *J Int Dent Med Res*. 2015;8:123-127.
18. Rosel E, Tsakos G, Bernabé E, Sheiham A, Bravo M. Assessing the level of agreement between the self- and interviewer-administered Child-OIDP. *Community Dent Oral Epidemiol*. 2010;38:340-347.