

## Original Article

# Cross-cultural Adaptation and Psychometric Properties of the Indonesia Version of the Scale of Oral Health Outcomes for 5-Year-Old Children

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ABSTRACT

**Objective:** Oral health-related quality of life (OHRQoL) questionnaires have been administered to children older than 6 years. Currently, the scale of oral health outcomes for 5-year-old children (SOHO-5) has been used to determine the OHRQoL through self-reports and parental proxy reports of children aged <6 years. This study was conducted to estimate the psychometric reliability and validity after adapting the SOHO-5 to the Indonesian language.

**Materials and Methods:** The cross-cultural adaptation was tested in children aged 5 years old and their parents. The reliability and validity of the questionnaire were measured among 161 kindergarten children in Jakarta, along with a clinical examination for dental caries.

**Results:** Cronbach's alpha coefficients for internal consistency were 0.89 and 0.86 for child's self-reports and parental reports, respectively. The test-retest reliability results were excellent based on repeated administrations in 27 children; the intraclass correlation coefficients were 0.81 and 0.94 for the parental reports and child's self-reports, respectively. No corrected item-total correlation value was lower than 0.30, allowing all items in the instrument to be included for data analyses. The construct validity of the child's self-reports showed that the Indonesian SOHO-5 total score was significantly associated only with the presence of dental caries ( $P < 0.001$ ). The construct validity of the parental reports described that the SOHO-5 total score was significantly associated with proxy-rated oral health, the child's perceived dental treatment and satisfaction with the child's oral health ( $P < 0.001$ ).

**Conclusions:** This study showed the Indonesian version of SOHO-5 is a reliable and valid OHRQoL measure for 5-year-old Indonesian children.

**KEYWORDS:** *Indonesia, oral health, preschool children, quality of life, validation*

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## INTRODUCTION

Dental caries is a major public health problem that affects 60%–90% of school-aged children globally.<sup>[1,2]</sup> Children are the focus of oral health policy in many countries.<sup>[3]</sup> Measurements of oral health and quality of life are important keys for evaluating oral health programs. Dental conditions, such as untreated dental caries, have been linked to delayed growth and cognitive development of children.<sup>[4]</sup> Furthermore, dental conditions can negatively impact the daily life of children, affecting their families psychologically and economically.<sup>[5]</sup> The incidence of dental diseases

in Indonesia is considerably high, and government policies have yet to improve the dental health status of Indonesians.<sup>[6]</sup> The prevalence of caries found in 5-year-old children in Jakarta and its satellites cities is 90%, and the decay score is 6.8 teeth.<sup>[7]</sup> Jakarta has a heterogeneous population, hailing from numerous ethnicities, and socioeconomic strata. This city can be

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considered representative of the Indonesian population, and children dental health conditions in Jakarta likely represent Indonesia's dental health status.<sup>[8]</sup>

The World Health Organization (WHO) defines health as a "condition of complete physical, mental and social well-being and not merely the absence of disease or susceptibility."<sup>(1)</sup> Based on this concept, measuring health should not be confined to the use of exclusively clinical normative indicators. The quality of life is defined as an individual's opinion about themselves regarding their sociocultural contexts, the order value where they live and about their aims, trusts, standards, and interests.<sup>[9]</sup> The quality of life is a broad concept that relates to a person's physical health, psychological condition, autonomy, social relationships, and personal beliefs of the environment.<sup>[9]</sup> Health-related quality of life (HRQoL) measures are now being used to evaluate dimensions of health, such as psychological and social aspects, that are not assessed by other measures. HRQoL measures can be categorized as general or specific. The general measures are used to evaluate the overall impact of health problems on quality of life. The specific measures focus on the effect of typical health conditions, health problems, or treatments on quality of life.<sup>[10]</sup>

Currently, there are several oral health-related quality of life (OHRQoL) questionnaires for children, which are available for the various age range.<sup>[11-16]</sup> Nevertheless, the development of OHRQoL measures for young children is challenging, due to their cognitive limitation, emotional development, and social contexts.<sup>[17]</sup> Currently, the scale of oral health outcomes for 5-year-old children (SOHO-5) can be used, along with early childhood oral health impact scale (ECOHIS).<sup>[15,18]</sup> The difference between both measures is that ECOHIS information on the OHRQoL of preschool children is obtained through only parental reports, and the SOHO-5 was expanded to measure the OHRQoL in children through both selves and parental reports.<sup>[19]</sup> The SOHO-5, that was developed in the United Kingdom, has only been validated in Brazilian-Portuguese.<sup>[20,21]</sup> This measure has not yet been validated in Indonesia. Therefore, this study aims to cross-culturally adapt the SOHO-5 to the Indonesian language and tested its reliability and validity in 5-year-old children.

## MATERIALS AND METHODS

The original SOHO-5 English version was obtained from a previous publication and was translated by a bilingual professional according to the guidelines for the cross-cultural adaptation process.<sup>[22,23]</sup> The translation was assessed and revised by an expert panel regarding the concept of item equivalence between the original version

and the Indonesian version. The panel comprised a dentist and a dental public health researcher who were familiar with the quality of life questionnaires and had bilingual capability. The consensus version in Indonesian language was pilot tested in 27 children aged between 5 and 6 years to determine its sensitivity to Indonesian culture and the use of proper wording. For the transcultural adaptation, face-to-face interviews by one interviewer were conducted for the children because of the lack of reading capability and were self-administered for the parents. The consensus version was then translated back into English. This back translation of the Indonesian version of the SOHO-5 into English was performed by an Indonesian dentist who was masked from the original wording of the SOHO-5. Finally, the SOHO-5 was confirmed by the expert panel after minor revisions and was then confirmed by the author of the SOHO-5.

This was a cross-sectional study that used questionnaires administered to both children and their parents. The study was approved by the Ethics Committee of the Faculty of Dentistry, Universitas Indonesia, No. 22/Ethical Approval/FKGUI/IV/2017 No. Protocol 070220317. The child's self-report and the parental report of the child's oral health experience asked by the SOHO-5 contains seven questions. For the parents, questions included difficulties in eating, drinking, speaking, playing, sleeping, and smiling due to pain and avoiding smiling due to impacts on self-confidence and appearance. The answers were rated using a five-point scale (no = 0, a little = 1, moderate = 2, a lot = 3, and a great deal = 4). The questions for the child also referred to difficulties in eating, drinking, speaking, playing, sleeping, smiling (due to pain), and smiling (due to appearance). The answer choice used a three-point scale (no = 0, a little = 1, and a lot = 2) aided by a face card with an appropriate picture. The total SOHO-5 scores for each version were derived from the sum of the answers. As there were seven questions, the total score varied from 0 to 14 for the children and from 0 to 28 for the parents.<sup>[24]</sup> A higher score indicated a better quality of life for children.<sup>[21]</sup>

The items in the questionnaires included global rating questions for the children and parents. These questions for the parents comprised of five-point Likert scale responses regarding proxy-rated oral health, child's overall well-being, and satisfaction with the child's oral health. The child's perceived dental treatment needs was followed by a yes or no response. The children were asked about their satisfaction with their oral health and their opinion on any existence of dental caries in their mouth.<sup>[21]</sup> Sample size estimation suggested that a total of 166 individuals completing the study would be

sufficient for detecting statistical significance ( $P < 0.05$ ) with a power of 95%, assuming a significant correlation of 0.4. A total of 183 individuals fulfilling the inclusion criteria were recruited, adding 10% of the total sample size needed. The inclusion criteria were children aged 5–6 years with parents willing to participate, having signed the informed consent form, no medical conditions that prevent a person from answering the questionnaires and no medical or pharmacotherapy history that might compromise the study outcome. The study was conducted at children's kindergartens. A one-time visit was conducted for informed consent, commencement of the questionnaires and caries examination. Caries was assessed according to the WHO criteria.<sup>[25]</sup> A single examiner different from the interviewer conducted the oral health examinations with a kappa agreement of 0.96 for def-t scoring. Data were collected by one interviewer from 5- to 6-year-old kindergarten students in Jakarta and their parents using questionnaires. Twelve kindergartens were clustered and randomly selected from official school registries, representing six districts in DKI Jakarta. For test-retest reliability measurements, 27 children<sup>[25]</sup> received an additional questionnaire within 1–2 weeks of the first administration. Reliability was tested using Cronbach's alpha and intraclass correlation coefficient (ICC). Construct validity was tested through associations between the Indonesian version of SOHO-5 scores and the global ratings using Spearman's correlation coefficients. Discriminant validity was examined through differences between SOHO-5 scores and caries experiences as follows def-t: 0 - without caries experience; def-t: 1–5 - low experience of caries; or def-t:  $\geq 6$  - high experience of caries.<sup>[21,25-27]</sup>

## RESULTS

There were 183 pairs of children and parents who participated. Eleven pairs were excluded because the children refused to be interviewed, and 161 pairs signed the parental informed consent form (a response rate of 93.6%). All interviewed participants completed all items in the Indonesian version of the SOHO-5, and no items in the questionnaires were excluded from data analysis due to missing data. Descriptive sociodemographic and clinical data of the sample are shown in Table 1. The prevalence of def-t was 82%, comprising 2.2% of filled teeth. The def-t index showed an average of 7.1 teeth. Test-retest reliability was conducted with 27 pairs of children and parents. ICCs were 0.94 and 0.81 for the scores of children and parents, respectively. These score indicated excellent reproducibility. Cronbach's alpha coefficients were 0.89 and 0.86 for the children's and parents' versions, respectively, indicating good internal consistency. No corrected item-total correlation value

**Table 1: Sociodemographic and clinical characteristics of the study sample (n=161)**

	n (%)
Child's age	
5 years	123 (76.4)
6 years	38 (23.6)
Child's gender	
Female	81 (49.7)
Male	80 (50.3)
Parent interviewed	
Mother	139 (86.3)
Father	22 (13.7)
Dental caries	
Without caries experience (def-t=0)	29 (18.0)
Low caries experience (def-t=1-5)	44 (27.3)
High caries experience (def-t $\geq 6$ )	88 (54.7)

was lower than 0.30, allowing all items in the instrument to be included in data analyses.

Table 2 shows a higher quality of life mean score measurement in children than in parents for all questions. The scores of the Indonesian SOHO-5 for parents ranged from 0 to 26, with a mean of 1.53. The Indonesian SOHO-5 score of children ranged from 0 to 14, with a mean of 2.86 (standard deviation: 3.96). There were no statistically significant correlations between the scores of parents and children. More than 44% of parents and 49% of children reported having oral impacts, with a SOHO-5 score  $> 0$ .

The construct validity of the children's version showed that the Indonesian SOHO-5 total score was significantly associated only with one global rating question that was on the presence of dental caries [Table 3]. Construct validity of the parental reports version showed a significant association between the SOHO-5 total score and the three global rating questions: proxy-rated oral health, satisfaction with the child's oral health and the child's perceived dental treatment [Table 4]. For both versions, the discriminant validity of children with high dental caries experience had significantly higher SOHO-5 total and item scores than children without or with low caries experience [Tables 5 and 6].

## DISCUSSION

This study is a cross-cultural adaptation of the SOHO-5. It was validated for use in Indonesian children and their parents living in Jakarta. It was also verified that the children in this study were capable of sharing their perceptions about their OHRQoL. Therefore, studies should not only depend on parental proxy reports.<sup>[19,28]</sup> Further, a pretest phase was employed for identifying potential problems with the questionnaire content, such as misunderstanding the intended meaning of items and

**Table 2: Item characteristics and reliability analysis (n=161)**

	Mean (SD)	Reliability		Cronbach's alpha
		Alpha if deleted*	CITC	
Children's version (0-14)	2.86 (3.97)			0.89
Difficulty in eating (0-2)	0.50 (0.76)	0.89	0.60	
Difficulty in drinking (0-2)	0.45 (0.73)	0.89	0.66	
Difficulty in speaking (0-2)	0.39 (0.70)	0.88	0.70	
Difficulty in playing (0-2)	0.39 (0.72)	0.88	0.75	
Avoiding smiling (due to pain) (0-2)	0.32 (0.64)	0.88	0.74	
Avoiding smiling (due to appearance) (0-2)	0.42 (0.75)	0.88	0.76	
Difficulty in sleeping (0-2)	0.40 (0.71)	0.88	0.70	
Parents' version (0-26)	1.53 (3.19)			0.86
Difficulty in eating (0-4)	0.47 (0.77)	0.85	0.62	
Difficulty in drinking (0-4)	0.14 (0.53)	0.85	0.59	
Difficulty in speaking (0-4)	0.09 (0.45)	0.85	0.63	
Difficulty in playing (0-4)	0.15 (0.56)	0.83	0.74	
Avoiding smiling (due to pain) (0-4)	0.29 (0.72)	0.83	0.72	
Avoiding smiling (due to appearance) (0-4)	0.12 (0.43)	0.86	0.51	
Difficulty in sleeping (0-4)	0.27 (0.73)	0.83	0.71	

\*Cronbach's alpha for subscales if an item is removed. CITC=Corrected item-total correlation, SD=Standard deviation

**Table 3: Construct validity of the children's version (n=161)**

	Satisfaction with oral health		Presence of dental cavity	
	r	P	r	P
Total score (0-14)	-0.137	0.084	0.314	<0.001*
Difficulty in eating (0-2)	-0.072	0.367	0.288	<0.001*
Difficulty in drinking (0-2)	-0.107	0.178	0.111	0.163
Difficulty in speaking (0-2)	-0.116	0.143	0.218	0.006*
Difficulty in playing (0-2)	-0.135	0.088	0.142	0.071
Avoiding smiling (due to pain) (0-2)	-0.061	0.439	0.232	0.003*
Avoiding smiling (due to appearance) (0-2)	-0.090	0.255	0.238	0.002*
Difficulty in sleeping (0-2)	-0.084	0.290	0.255	0.001*

\*Statistically significant with  $P < 0.05$ .  $r$ =Spearman's rank correlation coefficient

**Table 4: Construct validity of the parent's version (n=161)**

	Proxy-rated oral health		Satisfaction with the child's oral health		Child's perceived dental treatment		Child's overall well-being affected	
	r	P	r	P	r	P	r	P
Total score (0-26)	0.237	0.002*	0.268	0.001*	0.220	0.005*	-0.070	0.375
Difficulty in eating (0-4)	0.179	0.023*	0.197	0.012*	0.172	0.029*	-0.089	0.260
Difficulty in drinking (0-4)	-0.039	0.627	0.091	0.253	-0.087	0.273	0.041	0.604
Difficulty in speaking (0-4)	0.145	0.066	0.145	0.067	0.195	0.013*	0.161	0.042*
Difficulty in playing (0-4)	0.164	0.038*	0.188	0.017*	0.115	0.148	0.184	0.020*
Avoiding smiling (due to pain) (0-4)	0.099	0.212	0.160	0.042*	0.153	0.052	0.123	0.119
Avoiding smiling (due to appearance) (0-4)	0.100	0.206	0.109	0.168	0.112	0.158	-0.004	0.964
Difficulty in sleeping (0-4)	0.162	0.040*	0.243	0.002*	0.181	0.022*	0.121	0.126

\*Statistically significant with  $P < 0.05$ .  $r$ =Spearman's rank correlation coefficient

their clarity. The pretest phase was conducted based on the methods of a previous study.<sup>[21]</sup>

The results of this study indicated that the psychometric properties of the SOHO-5 Indonesian version were valid and reliable. In addition, both Indonesian- and English-language versions were semantically similar. The reliability of internal and test-retest consistencies of the

SOHO-5 was established for both versions. Regarding validity, not all global ratings were associated. The construct validity of the child's self-reports showed that the Indonesian SOHO-5 total score was significantly associated with only the presence of dental cavities. All item questions were significantly associated with the presence of dental cavities, except for difficulty in

**Table 5: Discriminant validity of the children's version**

Variables (minimum-maximum)	Mean (SD)			P
	Without caries experience (n=29)	Low caries experience (n=44)	High caries experience (n=8)	
Total score (0-14)	1.68 (3.48)	1.22 (2.42)	4.06 (4.33)	<0.001*
Difficulty in eating (0-2)	0.14 (0.44)	0.27 (0.58)	0.73 (0.86)	<0.001*
Difficulty in drinking (0-2)	0.31 (0.60)	0.23 (0.52)	0.60 (0.82)	0.020*
Difficulty in speaking (0-2)	0.28 (0.64)	0.11 (0.32)	0.57 (0.79)	0.002*
Difficulty in playing (0-2)	0.28 (0.59)	0.14 (0.46)	0.55 (0.82)	0.007*
Avoiding smiling (due to pain) (0-2)	0.24 (0.57)	0.11 (0.44)	0.44 (0.72)	0.008*
Avoiding smiling (due to appearance) (0-2)	0.24 (0.63)	0.18 (0.49)	0.60 (0.83)	0.003*
Difficulty in sleeping (0-2)	0.21 (0.49)	0.18 (0.49)	0.58 (0.81)	0.004*

P value from the Kruskal-Wallis test results. \*Statistically significant with  $P < 0.05$ . SD=Standard deviation

**Table 6: Discriminant validity for the parent's version**

	Without caries experience (n=29)	Low caries experience (n=44)	High caries experience (n=88)	P
	Mean (SD)	Mean (SD)	Mean (SD)	
Total score (0-26)	0.75 (2.50)	0.79 (1.65)	2.15 (3.81)	<0.001*
Difficulty in eating (0-4)	0.17 (0.46)	0.30 (0.55)	0.65 (0.89)	0.005*
Difficulty in drinking (0-4)	0 (0)	0.11 (0.38)	0.20 (0.66)	0.204
Difficulty in speaking (0-4)	0 (0)	0.05 (0.30)	0.15 (0.57)	0.150
Difficulty in playing (0-4)	0.07 (0.37)	0.05 (0.30)	0.23 (0.69)	0.081
Avoiding smiling (due to pain) (0-4)	0.28 (0.84)	0.14 (0.55)	0.36 (0.76)	0.043*
Avoiding smiling (due to appearance) (0-4)	0.07 (0.37)	0.05 (0.21)	0.18 (0.51)	0.120
Difficulty in sleeping (0-4)	0.17 (0.65)	0.11 (0.38)	0.39 (0.86)	0.035*

P value from the Kruskal-Wallis test results. \*Statistically significant with  $P < 0.05$ . SD=Standard deviation

drinking. It appears that even for children with high caries experience, drinking activity was not influenced. This could have possibly occurred because the questionnaire did not ask participants to specify the specific type of drinks as the ECOHIS does.<sup>[29]</sup>

The construct validity of the parental reports showed a significant association only with proxy-rated oral health, satisfaction with the child's oral health and the child's perceived dental treatment, but not all item questions were significant. The questions that were significant for proxy-rated oral health and satisfaction with the child's oral health were difficulty in eating, playing, and sleeping. The questions that were significant for the child's perceived dental treatment were difficulty in eating, speaking and sleeping. According to the parents, playing, and sleeping activities were the primary indicators for OHRQoL and children's overall well-being was not influenced by caries experience. The analysis also indicated discriminant validity between clinical groups based on the caries experience. Children with high caries experience had significantly higher SOHO-5 total scores and also item scores than children without and with low caries experience.<sup>[21,28]</sup>

The study was conducted only in Jakarta, the capital city of Indonesia. Therefore, the OHRQoL in the population

may be different. Nonetheless, Jakarta, as the capital city of Indonesia, was reported to be relatively heterogenic.<sup>[7]</sup> We acknowledge that 5- and 6-year-old children were not developmentally identical. While the original SOHO-5 study referred to 5-year-old children, an older child may be followed up and would answer the questions more easily because of advanced cognitive development.<sup>[30]</sup> This study also showed a low utilization of dental health services. Compared with previous studies conducted during 1998–2013, there was no increase in dental care utilization.<sup>[6]</sup> Although the Universal Health Coverage has been in use since 2014, there seem to be no changes in the reported prevalence of caries. This situation might be due to the persistent inequality in dental health care.<sup>[6]</sup> This fact might also become a reason for some of the different results compared with a Brazilian study's results, which showed a prevalence of caries of 44.6% and a mean of the SOHO-5 parental reports of 3.67.<sup>[21]</sup> In the present study, caries prevalence was 82%, and the mean parental reports of the SOHO-5 was 1.53. Brazil's national policy on oral health, also known as Smiling Brazil ("Brasil Sorridente"), was launched in 2004. This was one of the most innovative public oral health-care policies worldwide. The policy was successful, marked by the percentage of caries-free children that increased from 31% in 2003 to 44% in 2010.<sup>[27]</sup> This finding

implies that the level of awareness of Brazilian parents who had children aged <6 years regarding the importance of oral health was higher than that of Indonesian parents. As we are aware, parents of children in this age group are influenced by their parents/guardians who are the primary decision-makers regarding health-care issues.<sup>[31]</sup> Parental perceptions of their child's oral health are influenced by dental caries with pain, an older age of the child, parent's/caregiver's perceptions of the child's general health as poor and the impact on the OHRQoL of the family.<sup>[32]</sup>

## CONCLUSION

Finally, the present study focused on validating the Indonesia SOHO-5, with clinical determinants. To obtain meaningful results, a larger and more representative sample is required, therefore, this shall be a future research priority. This study allowed evidence was supporting the reliability and validity of the Indonesian questionnaire used as an OHRQoL measure for 5- to 6-year-old Indonesian children. Future studies should complement its psychometric testing and extend its application to wider sample, region, and socioeconomic level so that it can represent Indonesian multicultural.

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## CONFLICTS OF INTEREST

There are no conflicts of interest.

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