

## ORAL HEALTH LITERACY IN INDONESIAN ADOLESCENT

Anton Rahardjo<sup>1</sup>, Syifa Adinda<sup>1</sup>, Avina Anin Nasia<sup>1</sup>, Melissa Adiatman<sup>1</sup>, Febriana Setiawati<sup>1</sup>,  
Yuniardini Septorini Wimardhan<sup>2</sup>, Diah Ayu Maharani<sup>1\*</sup>

1. Department of Preventive and Public Health Dentistry, Faculty of Dentistry, University of Indonesia.

2. Department of Oral Medicine, Faculty of Dentistry, University of Indonesia.

### Abstract

The aim of this study was to develop an Indonesian version of the Oral Health Literacy (OHL) instrument and to analyze its validity and reliability among 12-14 years old in Jakarta, Indonesia.

OHL questionnaire was developed in Indonesian language. This study design is cross sectional with correlative and comparative analysis. The questions of the OHL scale were used to assess the components of oral health literacy. The test and retest reliability, internal consistency, convergent and discriminant validity of OHL questionnaire were also evaluated.

462 students completed the self-administered questionnaire. The mean total OHL questionnaire score was  $3.45 \pm 0.02$ . The Intra-class Correlation Coefficients was 0.75 and Cronbach's alpha was 0.77. The convergent and discriminant validity were confirmed by OHL scores being significantly associated with last dental visit ( $p < 0.001$ ).

The Indonesian Oral Health Literacy questionnaire described oral health literacy in children ages 12-14 years old in Jakarta, Indonesia.

*Clinical article (J Int Dent Med Res 2015; 8: (3), pp. 123-127)*

**Keywords:** Oral health literacy, validity, reliability, children.

**Received date:** 13 November 2015

**Accept date:** 23 November 2015

### Introduction

Oral health literacy is defined as a degree to which individuals have the capacity to gain, process, and understand basic oral health information and services needed to make appropriate oral health decisions.<sup>1</sup> Therefore, a community's oral health literacy level affects the overall burden of oral health diseases and contributes to the presence of oral health disparities.<sup>2</sup> Oral health literacy is an important contributing factor to the global disease burden, especially in Indonesia.<sup>3</sup> Identification of levels of health literacy may help tailor interventions that can be implemented to improve health outcomes.<sup>4</sup>

There are some other instruments that can be used to measure oral health literacy, such

as REALD-99, 30, ToFHLiD, OHLI, REALM-D, CMOHK, BHLOHKP, HKREALD-30, OHL-AQ, and HeLD.<sup>5</sup> The Health Literacy in Dentistry (HeLD) instrument accounts for the multidimensional nature of oral health literacy and encompasses the domains which have all been shown to impact on oral health status.<sup>5</sup> The HeLD instrument was developed as a reliable, valid and culturally suitable instrument to assess oral health literacy. The instrument was developed in an Indigenous Australian context.<sup>6</sup> The scale used the Health Literacy Management Scale (HeLMS) as a foundation. A number of theoretical constructs were included, such as one's ability to seek, understand and use oral health information to access and benefit from oral health care services.<sup>7,8</sup> The domains in HeLD reflect those used in the HeLMS: communication, access and economic barriers, receptivity, understanding, utilization and support. The results of a HeLD study highlighted its potential to be used across a variety of health care settings. The findings should be also replicated in other populations before the scale is used broadly in health services research and will be

#### \*Corresponding author:

Dr. Diah Ayu Maharani  
Department of Preventive and Public Health Dentistry, Faculty of  
Dentistry, University of Indonesia,  
Indonesia.  
E-mail: [diah.ayu64@ui.ac.id](mailto:diah.ayu64@ui.ac.id)

important to determine the effects of interventions or programs aimed at improving oral health outcomes.<sup>5,7</sup>

One of the goals of Indonesian health policy is "health for all," which includes dental care. Therefore, it is important to periodically assess dental health and to identify barriers to achieving good oral health.<sup>3</sup> Moreover, the perceived need for and utilization of dental care among Indonesians was found to be low, and there are persistent disparities in dental care.<sup>9</sup> Low health literacy may be a cause of the low perceived need, which justifies the exploration of health literacy in the Indonesian community.

Oral health literacy has emerged as a new public health challenge and is an important predictor of oral health outcomes. To date, health literacy instrument for children in the Indonesian language has not been available, although children are considered vulnerable. The objective of this study was to validate a self-administered Oral Health Literacy questionnaire for Indonesian adolescents.

## Methods

This study was performed in 2015 among the students of junior high schools in Jakarta, the capital city of Indonesia. A self-administered survey was developed for junior high school students. The research protocol was approved by the Faculty of Dentistry of Indonesia Ethical Committee prior to data collection (Approval No. 09750715). Random sampling was conducted to select junior high schools. The total sample frame was obtained from the official website of the education office of Jakarta. Six schools were selected among 326 public junior high schools in Jakarta. Therefore, the data used in this study were obtained from a representative sample of 462 school-children whose ages were 12-14 years old. As was suggested by Charter, the minimum sample size needs to be larger than 400 to evaluate reliability and validity.<sup>12</sup> Informed consent was obtained from the parents prior the study commandments.

The original HeLD-14 English version was translated into Indonesian script using the forward-backward process<sup>10,11</sup> by an Indonesian dentist who is fluent in both Indonesian and English into an Indonesian version according to the guidelines for the cross-cultural adaptation process. The translation was assessed and

revised by an expert panel with regard to concept and item equivalence between the original version and Indonesian version. The panel consisted of a dentist, and a dental public health researcher familiar with oral health literacy questionnaires. The backward translation of the Indonesian version of HeLD into English was performed by an Indonesian dentist who is undergoing Master Degree in the US, who was not familiar with the questionnaire. Finally, HeLD-14 was confirmed by the expert panel after minor revision.

The subjects in this study were in adolescent ages, therefore some questions are irrelevant for them. The questions in access and economic barriers domains cannot be used because usually the parents will take the adolescent to see a dentist and do the payment for them. Therefore, seven questions remained after the deletion (Figure 1).

Domain	Questions
Communication	1. Are you able to use information from a dentist to make a decision about your dental health?
Receptivity	2. Are you able to pay attention to your dental health or oral health needs? 3. Are you able to spare your time to do good things for your dental health or oral health?
Understanding	4. Are you able to read brochures about dental health or oral health information which is available in a dental clinic or it's waiting room?
Utilisation	5. Are you able to do the instruction that is given by a dentist to you? 6. Are you able to use advice from a dentist to make a decision about your dental health?
Support	7. Are you able to ask someone to accompany you to see a dentist?

**Figure 1.** The Indonesian Oral Health Literacy Questionnaire for adolescent that was used in this study

The questions that constituted the Oral Health Literacy questionnaire focused on the 'difficulty experienced'. The response options for the respondents were graded on a 5-point Likert-type scale ranging from 'without any difficulty' to 'unable to do'. Scores were coded 0 to 4, and the possible final score range was 0-28. Higher scores indicate greater oral health literacy.<sup>7</sup>

A week after the initial questionnaire was filled, sample was randomized for the purpose of estimating the reliability. Ten percent of total subjects (n=46) completed the retest. The Intra-class Correlation Coefficient (ICC) was assessed between scores from the two administrations. As an aid to interpret the ICC, the following standards were use: an ICC higher than 0.80 indicated excellent agreement, one of 0.41-0.80 good agreement, one of 0.41-0.60 moderate agreement and one less than 0.41 poor agreement.<sup>13</sup> The internal consistency was further determined using Cronbach's alpha.<sup>14</sup>

Cronbach's alpha was evaluated according to published guidelines that indicated that 0.7 was an acceptable reliability coefficient.<sup>15</sup>

Convergent validity was tested by comparing Oral Health Literacy scores categories of educational levels and pattern of dental visits. Differences in means were tested using Kruskal Wallis test. Further, the dental visits of the participants were tested by using Spearman's rank correlation coefficient. We reasoned that people with better oral health literacy are likely to be better educated and visit a dentist more regularly. Discriminant validity of HeLD scores and each subscales scores was assessed by comparing the mean of total score with self-rated general and oral health. Data were coded and analyzed using SPSS for Windows v20.0.

## Results

The characteristics of the 462 participants in this study are displayed in Table 1.

Characteristics	N (%)	Oral Health Literacy	
		Mean	SD
<b>Overall</b>		3.45	0.02
<b>Gender†</b>			
Female	253 (54.8)	3.55**	0.45
Male	209 (45.2)	3.33**	0.62
<b>Mother's education‡</b>			
Low	81 (17.5)	3.38	0.72
Middle	318 (68.8)	3.46	0.51
High	63 (13.6)	3.49	0.47
<b>Last dental visit‡</b>			
Never	116 (25.1)	3.34*	0.68
More than a year	170 (36.8)	3.43*	0.50
Less than a year	176 (38.1)	3.54*	0.48

P-value was tested by using Mann Whitney U-test (†) and Kruskal Wallis test (‡)

\*p<0.05, \*\*p<0.01

**Table 1.** Characteristics of the 462 participants in this study

The participants had a median age of 13 years (range 12 to 14). Oral health literacy (OHL) was significantly higher among female students and those who visit a dentist less than a year. The mean of total HeLD score was 3.45±0.02.

Table 2 presents the following findings for the OHL instrument mean item scores,

Cronbach's alpha and corrected item-total correlation (CITC). Internal reliability measured by Cronbach's alpha showed a high relatedness of all items with the overall mean OHL score, indicating that consistency could not be improved by deleting any items. The overall Cronbach's alpha of the Indonesian version of the OHL questionnaire for adolescent was 0.77 the Cronbach's alpha coefficients of each domain were above 0.70, which is considered satisfactory. No CITC was lower than 0.30, which allowed all items to be included in the instrument. The highest mean scores were in the utilization domain (3.60±0.73), and the lowest mean scores were in the communication domain (3.27±0.96).

Subscale and item	Mean (SD)	Alpha if deleted	CITC
<b>Communication</b>			
Question 1	3.27 (0.96)	0.74	0.53
<b>Receptivity</b>			
Question 2	3.37 (0.83)	0.75	0.48
Question 2	3.43 (0.79)	0.74	0.51
<b>Understanding</b>			
Question 4	3.53 (0.87)	0.74	0.51
<b>Utilisation</b>			
Question 5	3.50 (0.80)	0.73	0.55
Question 6	3.60 (0.73)	0.74	0.53
<b>Support</b>			
Question 7	3.45 (0.91)	0.77	0.39

Cronbach's Alpha: 0.77

Alpha if deleted = Cronbach's alpha if deleted calculated on four items for each sub scale

CITC = corrected item-total correlation

**Table 2.** Item characteristics and reliability analysis

Intra-class correlation coefficient (ICC) was used to estimate inter-rater reliability of participants. The interpretation standards were used: ICCs>0.80 indicated excellent agreement, 0.61-0.80 good agreement, 0.41-0.60 moderate agreement, 0-0.40 poor agreement. The ICC value of in terms of test-retest reliability was 0.754 (confidence intervals = 0.53-0.91), which indicated test-retest reliability, was good agreement.<sup>13</sup> The correlations between subscales are shown in Table 3. Item subscale correlations ranged from 0.24 to 0.42 indicating the multidimensionality of the scale (correlations are low but all significant at the p < 0.01 level).

Component	Communication	Receptivity	Understanding	Utilisation
Communication	-			
Receptivity	0.40	-		
Understanding	0.42	0.31	-	
Utilisation	0.40	0.40	0.33	-
Support	0.25	0.24	0.30	0.30

Correlations all significant at the 0.01 level

**Table 3.** Associations (Spearman's  $r$  correlations) between the seven domains of the Oral Health Literacy Questionnaire scale.

Table 4 shows discriminant validity, with higher OHL scores associated with better self-rated in general health for overall OHL, communication, receptivity, utilization and support. Excellent self-rated in oral health for overall OHL, communication, receptivity and support. Convergent validity was obtained from OHL scores being significantly associated with last seeing a dentist less than a year ago for total OHL mean scores ( $r$  value=0.14), communication ( $r$  value=0.12), receptivity ( $r$  value=0.10) and support ( $r$  value=0.54).

	Subscales [mean (SD)]					
	Mean OHL	Communication	Receptivity	Understanding	Utilisation	Support
<b>Self-rated general health</b>						
Excellent	25.9 (2.1)**	3.6 (0.6)**	7.4 (1.0)**	3.6 (0.8)	7.7 (0.5)**	3.6 (0.9)
Good	24.2 (3.6)	3.3 (0.9)	6.8 (1.3)	3.5 (0.8)	7.0 (1.4)	3.5 (0.9)
Poor	23.0 (4.7)	3.0 (1.2)	6.3 (1.6)	3.5 (1.0)	6.9 (1.6)	3.3 (1.0)
<b>Self-rated oral health</b>						
Excellent	25.8 (2.1)**	3.6 (0.7)*	7.5 (0.8)**	3.6 (0.6)	7.7 (0.6)	3.4 (1.0)**
Good	24.3 (3.6)	3.3 (0.8)	6.8 (1.3)	3.5 (0.8)	7.1 (1.4)	3.5 (0.8)
Poor	23.2 (4.4)	3.0 (1.2)	6.5 (1.5)	3.4 (1.0)	6.9 (1.5)	3.4 (1.0)

Kruskal Wallis test were used

\* $p < 0.05$ , \*\*  $p < 0.01$

**Table 4.** Discriminant validity - mean scores for the Oral Health Literacy (OHL) questionnaire and its subscales by self-rated and self-reported health

## Discussion

Persistent inequality of oral health in Indonesia has been reported.<sup>3,9</sup> Dental public health improvements remain a fundamental need in Indonesia.<sup>16</sup> Strategies to reduce oral health inequalities are not possible without improving other influential factors including oral health literacy, oral health service providers and also policy makers.<sup>17</sup> Previous findings confirm that the majority of tools are heavily biased toward word recognition, numeracy and reading skills.<sup>5</sup> More recent developments have attempted to

include other important factors, such as decision-making and service navigation. The OHL instrument developed in this study was adopted from the HeLD and was modified to be an appropriate instrument to assess oral health literacy and its impact to the oral health outcome in Indonesia. This study included junior high school students in Jakarta. Jakarta was chosen because it is the capital city of Indonesia. The citizens there come from many parts of Indonesia and represent the various tribes of Indonesia.

The results presented in this paper should be considered in light of the study's limitations. First, the HeLD instrument was made for indigenous adults aged 18+ years which was already been stated in the previous study in Australia.<sup>7</sup> This study purpose was to have an understanding among the adolescents for earlier interventions and health promotion. Moreover to analyze the ability to seek, understand and use oral health information to access and benefit from oral health care services in a younger age. The questionnaire needs to be adjusted to suit children's capability and interests by changing the sequence of questions and simplifying severity and frequency scales or using pictures of performances.<sup>18</sup> Moreover, the communication, understanding and support domains were only presented with one question which might have the potential of not appropriately representing the domain measured, and not presenting the multi dimensionality which it should. But not many of oral health literacy studies were conducted in children who are the prime target group of oral health care service in many countries including Indonesia.

In this study, the Indonesian OHL questionnaire showed valid and reliable properties to be used among 12-14 years old school children in Jakarta, Indonesia. The sample used were not less than 400 to control measurement error in the test and provide precise estimates of the population validity coefficient.<sup>12</sup> The performance of reliability was considered satisfactory. The spearman's correlation coefficients between six domains were significantly associated with last dental visit but not with mother's education. Even though, the mean shows that the more educated mothers, the oral health literacy of the children are also increasing.

To increase the validity of the Indonesian OHL instrument, general population samples are



necessary for future research and also further questions should be added to be able to measure the multidimensionality of oral health literacy. Assessments of the associations between oral health literacy and oral health outcomes are also needed. In addition, further work is needed to develop tools that are adaptive and culturally acceptable for specific populations. The tools should be sensitive to measuring changes in literacy levels resulting from any interventions. Moreover, the Indonesian version of OHL questionnaire has the potential to be a reliable and valid oral health literacy instrument for use in the general population in Indonesia. Future studies should complement its psychometric testing and extend its application to other samples as well as to evaluate oral health programs.

### Declaration of Interest

The authors report no conflict of interest and the research is supported by the Indonesian Ministry of Education.

### References

1. Nutbeam D. Health Promotion Glossary. Health Promotion International. Geneva: WHO; 1998. 349-364 p.
2. Petersen PE, Bourgeois D, Ogawa H, Estupinan-Day S, Ndiaye C. The global burden of oral diseases and risks to oral health. *Bull World Health Organ.* 2005;83:661-9.
3. Maharani DA, Rahardjo A. Is the utilisation of dental care based on need or socioeconomic status? A study of dental care in Indonesia from 1999 to 2009. *Int Dent J.* 2012;62:90-4.
4. Nutbeam D. The evolving concept of health literacy. *Soc Sci Med.* 2008;67:2072-8.
5. Dickson-Swift V, Kenny A, Farmer J, Gussy M, Larkins S. Measuring oral health literacy: a scoping review of existing tools. *BMC Oral Health.* 2014;14:148.
6. Jones K, Brennan D, Parker E, Jamieson L. Development of a short-form Health Literacy Dental Scale (HeLD-14). *Community Dent Oral Epidemiol.* 2015;43:143-51.
7. Jones K, Parker E, Mills H, Brennan D, Jamieson LM. Development and psychometric validation of a Health Literacy in Dentistry scale (HeLD). *Community Dent Health.* 2014;31:37-43.
8. Jordan JE, Buchbinder R, Briggs AM, Elsworth GR, Busija L. The Health literacy management scale (HeLMS): a measure of an individual's capacity to seek, understand and use health information within the healthcare setting. *Patient Educ Couns.* 2013;91:228-35.
9. Maharani DA. Perceived need for and utilization of dental care in Indonesia in 2006 and 2007: a secondary analysis. *J Oral Sci.* 2009;51:545-50.
10. Greco D. L. Questionnaire development: 3. Translation. *J Health Soc Policy.* 1996;8:39-48.
11. Wong HM, Bridges SM, Yiu CKY, McGrath CPJ, Au TK, Parthasarathy DS. Development and validation of Hong Kong Rapid Estimate of Adult Literacy in Dentistry. *J Investig Clin Dent.* 2012;3:118-27.
12. Charter R a. Sample Size Requirements for Precise Estimates of Reliability, Generalizability, and Validity Coefficients. *J Clin Exp Neuropsychol (Neuropsychology, Dev Cogn Sect A).* 1999;21:559-66.
13. Kim EJ, Song DH, Kim SJ, Park JY, Lee E, Seok JH, et al. Proxy and patients ratings on quality of life in patients with schizophrenia and bipolar disorder in Korea. *Qual Life Res.* 2010;19:521-9.
14. Cronbach LJ. Coefficient alpha and the internal structure of tests. *Psychometrika.* 1951;16:297-334.
15. Nunnally JC. *Psychometric theory.* New York: McGraw-Hill; 1978.
16. Rahardjo A, Maharani DA, Kiswanjaya B, Idrus E, Nicholson J, Cunningham PJ, et al. Measurement of Tooth Brushing Frequency, Time of Day and Duration of Adults and Children in Jakarta, Indonesia. 2015;21:85-8.
17. Horowitz AM, Kleinman D V. Oral health literacy: A pathway to reducing oral health disparities in Maryland. *J Public Health Dent.* 2012;72.
18. Gherunpong S, Tsakos G, Sheiham A. Developing and evaluating an oral health-related quality of life index for children; The CHILD-OIDP. *Community Dent Health.* 2004;21(October 2015):161-9.