

Validity and Reliability of the Persian Version of the Health Literacy Dental Scale (HeLD-14)

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ABSTRACT

Background and Objective: Nowadays, oral health literacy is an important and influential component on people's general health. One of the newest indicators in this field is 14-item Health Literacy in Dentistry (HeLD-14) questionnaire but it has never been applied in Persian. The purpose of the present study was to validate the usage of HeLD-14 among Iranians.

Materials and Methods: A consecutive sample (n= 400 adults) participated in this validation study. The subjects were selected by random sampling from those referring to dental clinics in Kerman .All participants self-completed the (standard forward & backward) translated HeLD-14. Construct validity was assessed by examining the correlation between HeLD-14 scores and self-reported oral health variables (referring to a dentist in the last year, oral health, perceived need to dental treatments & having removable prosthesis appliances). Reliability was calculated using Cronbach's alpha (for internal consistency) and corrected item-total correlation. Effect size (ES) and Standardized Response Mean (SRM) were calculated for the responsiveness of the scale and exploratory factor analysis was done by measuring Kaiser-Meyer-Olkin (KMO), Bartlett's sphericity test and scree plot.

Results: The translated HeLD-14 had high reliability and validity. the subjects who had more dental needs based on their self-appraisal believed that they had more favorable oral health and had higher OHL level, and subjects who wore dentures had low OHL levels(P<0.05) indicated sufficient construct validity. Moreover, the confirmatory factor analysis and expletory of factor analysis was done.

Conclusion: The findings of this study confirm the validity and reliability of the Persian version of HeLD-14.

Paper Type: Research Article

Keywords: Health Literacy, Oral Health, Questionnaire Design.

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Introduction

Since the late 1990s, the oral health literacy (OHL), as a component of health literacy, defined as “an individual’s ability to prepare, process, and understand basic information, the required treatment, and make the necessary oral health-related decisions,” has attracted a great deal of attention (1). Currently, attention to the OHL index has increased universally because it is believed that an increase in OHL levels can decrease the high economic burden of common oral and dental diseases (caries and periodontal diseases) in different communities(2,3). Besides, it is expected that patients with lower OHL will have less frequent dental visits, resulting in more severe oral and dental diseases. An improvement in OHL is effective in improving the quality of life, decreasing social inequality, preventing the loss of economic resources, and increasing individuals’ general health due to its reciprocal relationship with oral health, facilitation of decision-making processes, and provision of services by policymakers in the field of oral health(4,5). On the other hand, it can affect health behaviors and regular dental visits. Considering what was discussed above, the WHO has made an improvement in OHL levels worldwide one of its priorities [6,7]. Therefore, due to the great importance of this health field, many tools have been introduced to date to measure this variable [8,9]. A large number of items in most of these questionnaires make it difficult for the interviewer and interviewee to complete them; therefore, a more concise tool is necessary for this field(10).

Jones et al (2014) devised the Health Literacy Dental Scale (HeLD) tool and evaluated its validity, reporting that this 29-question tool exhibited the necessary validity and reliability to measure OHL of adult Aboriginals living in Australian villages [11]. Besides, these researchers introduced a more concise version of the HeLD tool with 14

questions, and a study on the process of making it more concise showed that the version with 14 questions was easy and effective for research and clinical applications [12]. Since the Persian versions of OHL tools currently available are not short and effective [13-15], the present study was undertaken to validate the HeLD-14 questionnaire in Persian, so that more valid epidemiological surveys can be carried out with large sample sizes in the future. The study population in the present study was selected from those living in the largest province in Iran, i.e., the Kerman Province.

Materials and Method

In the present validation study, the standard English version of the HeLD-14 questionnaire was used. The questionnaire contains 14 standard questions, and the interviewee is asked to answer the questions in the form of a 5-mode Likert scale. On this scale, a score of zero is assigned to the reply “with no difficulty” and 4 to “I cannot do this.” Therefore, the score range is 0–56, with higher numeric values indicating lower oral health literacy [11]. Besides, a score of 19 is considered a cutoff point to categorize the subjects’ oral health literacy; scores <19 indicate poor OHL, and scores ≥19 indicate favorable OHL [11,12]. The sample size was 400 according to the routine for such studies to achieve the highest accuracy possible. The subjects were selected by random sampling from those referring to dental clinics in Kerman city. The inclusion criteria consisted of an informed consent form, a minimum age of 18 years, an ability to understand and speak in Persian, and general health.

The subjects participated in the study voluntarily, and their personal data were kept confidential. First, the questionnaire was translated into Persian based on standard principles. In the first stage, two translators

experienced in translating technical texts from English into Persian independently translated the questionnaire into Persian. The translated questionnaires were then translated back into English by two translators who were experienced in translating from Persian into English and were not aware of the original text of the questionnaire in English. Then the two English versions of the questionnaires (translated and original) were compared, and in case of any discrepancy, a session was held with the translators to reach a consensus about the final translated text. [16].

Interviews were carried out, and the questionnaire was completed by consecutive sampling to evaluate the construct validity.

The demographic data (age, gender, educational level, and occupation) of all the subjects were recorded. The subjects were questioned about the following: use of removable dentures or plaques (Yes/No), their appraisal of oral and dental health (poor, moderate, good), their appraisal of dental treatment needs (no need, low level of need, high level of need) and the mean number of dental visits yearly (no visits, one visit, more than one visit). Then, the relationship between this questionnaire and the five variables above was evaluated. It was expected that significant relationships would be found between the questionnaire results and the four variables above ($P < 0.05$). T-test was used to evaluate such relationships, followed by post hoc Tukey tests. Besides, the logistic regression model was used to evaluate the relationship between OHL levels and the variables used in the construct validity section.

The internal consistency method was used to determine reliability. To this end, Cronbach's alpha coefficient was calculated for the completed questionnaires. To this end, the favorable coefficient was at least 0.7. Besides, two other coefficients, too, were used to evaluate reliability: the corrected item-total correlation coefficient

with an acceptable level of 0.4 and Cronbach's alpha coefficient with one-by-one elimination of the questions [16].

.In order to find out about the operability and the adequacy of sampling Factor analysis was used to determine the number of factors extracted from the questionnaire and confirm their factorable nature. One of the crucial applications of factor analysis is to ensure whether it is possible to sum up the responses to questionnaire questions and report it as one score. KMO (Kaiser-Myer-Olkin) and MSA (Measure of Sampling Adequacy) were calculated, and Bartlett (sphericity) and total variance were used to carry out factor analysis [17].

Results

Of 445 distributed questionnaires, 400 questionnaires that had been completed fully were collected (a response rate of 89.8%). The participants' mean and standard deviation age was 33.71 ± 12.59 years, with a mean 25.33 ± 5.89 natural teeth in their oral cavities

Table 1 presents the demographic data of the participants. It shows that, female subjects, self-employed subjects, and those with higher education achieved the highest scores and percentages.

Table 1: Demographic Data of the Respondents to HELD-14 Questionnaire

Variable	Frequency (Percent)
Gender	Male 157 (39.3)
	Female 243 (60.7)
Job Status	Unemployed 121 (30.3)
	Student 83 (20.7)
	Self-employment 123 (30.7)
	Employee 73 (18.3)
Education Level	Illiterate 18 (4.5)
	Under Diploma 97 (24.2)
	Diploma 110 (27.5)
	Academic 175 (43.8)

Figure 1 shows the distribution of the responses of 400 participants to 14 questions on the questionnaire. The most frequent response was related to question 7 (ability to pay for dental

visits) with “I have no problem,” and the least frequent response was related to question 8 (the ability to pay dental treatment costs).

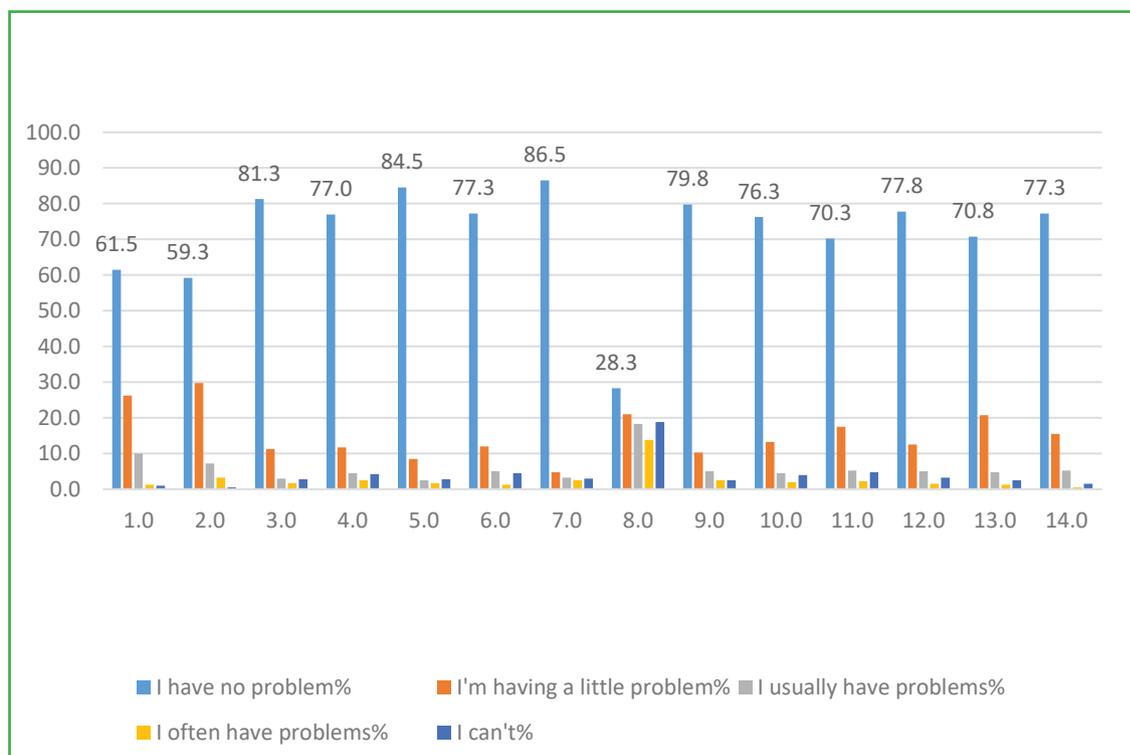


Figure 1: Relative frequency of Answers to HELD-14 Items among 400 Subjects

In the section on determining the construct validity, as shown in Table 2, there were significant relationships between the final scores of the completed questionnaires and the four items of the “use of removable dentures or plaques, personal appraisal of oral and dental health, personal appraisal of dental treatment needs, and the mean frequency of dental visits.” Therefore, it might be concluded that this tool exhibited favorable construct validity, indicating that the subjects who had more dental needs based on their self-appraisal believed that they had more favorable oral health, had more numerous annual dental visits, and had higher OHL level, and subjects who wore dentures had low OHL levels.

Table 2: Validity Determination of HELD-14 Questionnaire in Persian

Variable	Frequency (Percent)	P value
Using Denture or Removable Prosthesis	Yes 44(11)	0.05*
	No 356(89)	
Self-reported Oral and Dental Health Status	Poor 96(24)	0.0001*
	Moderate 223(55.7)	
	Good 81(20.3)	
Perceived Need to Dental Treatments	No 27(6.7)	0.023*
	Little 207(51.7)	
	Much 166(41.6)	
Referring to a Dentist in the Last Year	No 83(20.7)	0.006*
	Once 163(40.7)	
	More than Once 154(38.6)	

In the section on the questionnaire reliability, Cronbach's alpha coefficient was 0.809, indicating the questionnaire's high internal consistency. Table 3 presents the reliability coefficients. According to the table, First, the translation process done and eventually, elimination of the 14 questions one-by-one did not increase Cronbach's alpha coefficient except for question 9, and when the items were eliminated one-by-one, the minimum Cronbach's alpha reached 0.7. Concerning the item-total relationship, too, all the relevant coefficients were favorable except for item 9. Also, the total score would be in the 19–20 range if the items were eliminated one-by-one, and the changes would not increase beyond their range.

Table 3: Reliability Determination of HELD-14 Questionnaire in Persian

Questions	Corrected Item-Total Correlation
Q1	0.407
Q2	0.432
Q3	0.392
Q4	0.479
Q5	0.469
Q6	0.384
Q7	0.559
Q8	0.533
Q9	0.250
Q10	0.495
Q11	0.582
Q12	0.614
Q13	0.570
Q14	0.434

Calculation of the coefficients related to the factor analysis of the evaluated tool (i.e., HeLD-14) showed KMO=0.6 and the significance of the Bartlett test ($P=0.000$), indicating that the questions on the questionnaire were well factorable and all the questions on the HeLD-14 could be considered.

Discussion

The present study showed that the Persian version of the HeLD-14 tool exhibited favorable psychometric characteristics. Yazdani et al reported that 48.5% of their interviewees had favorable OHL level, which was 62.5% in the study by Malekmohammadi et al; therefore, the OHL level achieved in the present study was higher than that in the former study and lower than that in the latter study [18,19]. However, such a comparison is not accurate because the tool evaluated in the present study is different from the two studies above (OHL-AQ). Besides, the mean OHL score in the present study (22.22) cannot be compared with the mean scores in the two studies above (12.07 and 11.5) because the difference in the tools used does not make it possible to make such a comparison. However, it can be claimed that the OHL levels of the participants in the two studies above were almost similar due to the use of a similar tool (OHL-AQ) [19,20]. Evaluation of the few applied Persian studies to date on the OHL shows that all of them have used the OHL-AQ tool (18-20). Therefore, it can be concluded that two other Persian tools in this field (REALD-99) have not been applied to determine OHL, which is possibly due to its numerous items, making it difficult to complete the questionnaires in research. Therefore, when there are more practical and more comfortable tools in the English and Spanish languages [21], the need for determining the validity of newer tools becomes more evident.

The developers of the HeLD-14 tool in Australia reported a Cronbach's alpha coefficient of 0.91 for the main version with 29 items and a coefficient of 0.87 for the concise version with 14 items [14,15], a little higher than that in the present study. However, values >0.7 are acceptable for this coefficient. Ju et al compared these 29- and 14-item versions of the questionnaire and

reported that the Cronbach's alpha for both versions was >0.7 , which is acceptable [22].

In a study by Jones et al on the 29-item HeLD questionnaire, there were significant relationships in the validity of the questionnaire concerning the items of "having a toothbrush, use of a toothbrush, the last dental visit in the past year, knowledge about the effect of dental floss on teeth, and personal appraisal of health." In determining the validity of the 14-item version of the tool, too, there was a significant relationship for the personal appraisal of oral health. The significant relationship with the two variables of "dental visits in the last year and personal appraisal of oral health" was similar between the present study and two studies by Jones et al; however, there were differences, too (1415). Also, it appears that the aim of "personal appraisal of health" in determining the validity of the 29-item version of the questionnaire by Jones et al was the "general health," not the "dental health." Therefore, the similarity cannot be considered 100%. The significant relationship between the OHL levels of the subjects and their annual dental visits in the present study was similar to that in a study by Hendersen et al in the United States [23]. In other words, these researchers, too, showed that individuals with a low OHL level had fewer dental visits, too. However, it should be pointed out that although the tool used by these researchers was HeLD-14, similar to the present study, culture, access to dental services, and many other factors raised cast doubts about the similarity of the findings of these two studies.

Hendersen et al used the HeLD-14 tool and estimated that more than two-thirds of their subjects had low OHL levels [23], which is much lower than the present study (almost the opposite because in the present study, almost 60% of the participants had favorable OHL levels). However,

similar to previous findings, despite the tool's similarity, it is not possible to comment in this respect due to differences in social variables. Therefore, it can be concluded that similar tools and almost similar study populations are necessary to make precise comparisons between such studies.

It appears achieving a significant relationship between the final score of an OHL tool and the two items of "the personal appraisal of the need for dental treatments and the use of removable dentures or plaques" are the specific results of the present study. However, some researchers, including Malekmohammadi and Sistani, reported significant relationships between the OHL levels and variables such as gender, educational level, oral health-related behaviors, age, and educational level [19,24]; such results were not achieved in the present study. Naghibi Sistani et al reported in two other studies that the OHL index had a significant relationship with health-related behaviors and use of dental services; besides, independently from the socioeconomic variables (occupation, education, income...), it is considered a vital component of oral health, and in the health system in countries planning to develop health care systems, it should be considered an essential variable. They also reported that individuals' use of two (or more than two) data sources (i.e., dentists, mass media, etc.) is the main factor for predicting OHL levels [25,26]. In some previous studies, such as these by Khodadadi et al and Yazdani et al, too, a significant relationship has been reported between the parents' OHL and children's dmft/DMFT [18,19].

Jones et al and Ju et al identified seven conceptual domains for HeLD-14 [15,22]. However, in the Persian translation and the factor analysis carried out in the present study, these (sub)domains were not delineated. The

highest frequency of the response “I have no problem” for the “ability to pay for dental visits” and the lowest response rate for the “ability to pay for dental costs” indicates that the “economic domain” in the present study was more significant than other conceptual domains delineated by Jones et al and Ju et al, and it might be claimed that the role of economic barriers in the study population was more important than other (sub) domains; however, further studies are necessary to reach a more definite conclusion.

An important consideration is the conceptual similarity of these two questions, both of which are related to dental visits; however, based on the (sub)domains delineated by Jones et al and Ju et al, question 6 was related to the “support” (sub)domain and the question 10 was related to the “availability” (sub)domain. This, too, can be another indication for two issues: First, the conceptual domains delineated by Jones et al and Ju et al are less objective in the Persian language, which was confirmed by the results of the factor analysis on the present study. Second, making an appointment for a dental visit in the Iranian community is different from

that in the community (i.e., Australia) it has been designed and has a different practical aspect, which is not unexpected [15,22]. The limitation of the study was the non-cooperation of some participants who tried to attract their cooperation by explaining the importance of the research. Due to the importance of oral health literacy and the small number of tools available in Persian, it is recommended that further studies be conducted to validate oral health literacy tools in Persian.

Conclusion: The evaluation of psychometric characteristics of the HeLD-14 tool in the present study showed that the translated Persian version of this tool has good validity and reliability to determine the Persian-speaking community’s OHL level

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Conflict of Interest: The authors declare no conflict of interest.

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