ORIGINAL ARTICLE

Relationship between mother's oral health literacy level with oral hygiene behavior and self-reported oral health status in sociodemographic scope

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Received: 19 November 2021
Revised: 15 March 2023
Accepted: 31 March 2023
Published: 31 March 2023
DOI: 10.24198/pjd.vol35no1.35411

Citation:
Maudi, T;. Suryani, N;. Setiawan, AS;. Relationship between Mother's Literacy Level with oral hygiene Behavior and self-reported oral health status in sociodemographic scope, March. 2023; 35(1): 40-46.

ABSTRACT

Introduction: Oral Health Literacy (OHL) plays an important role in reducing the gap in promoting oral health. Oral health literacy of mothers is important due to maternal OHL can affect the family's oral health, especially in children. Sufficient OHL of mothers also help strengthen their capacities to improve their own and their children's oral health. The purpose of this study was to analyze the oral health literacy level of mothers and its relationship to the oral hygiene behavior and self-reported oral health status in the sociodemographic scope. **Methods:** The type of research was correlational analytics with cross-sectional techniques. The samples were 158 mothers, collected using purposive sampling in Parigi District, Pangandaran Regency. Data were collected using the Health Literacy in Dentistry (HeLD-14) questionnaires which had been cross-adapted and included questions to assess oral hygiene behaviors with the Indonesian version of the oral hygiene behavior index. Data were analyzed using the Pearson correlation test and independent sample t-test. **Results:** The majority of mothers had a good educational level and did not get employment, and had a good level of oral health literacy, with an average score of 49.63±7.16. Dental hygiene behaviors were in the good category with a mean score of 3.13±0.82 and the results of self-assessment mostly stated that the oral and dental conditions were in a proper state. The results of the OHL correlation tests with oral hygiene behaviors and self-reported oral health status showed significant relations with low correlations (p=0.04; r=0.16) and (p=0.01; r=0.21). **Conclusion:** Mothers' oral health literacy level is in good category and there are relations between oral dental health literacy with oral hygiene behaviors and self-reported oral health status.

KEYWORDS
oral health literacy, HeLD-14, oral hygiene behavior, sociodemographic, mother, oral health status

INTRODUCTION

Currently, oral health inequality occurs in various parts of the world, including Indonesia.[1,2] The poor condition of dental health in Indonesia is still being reported with a high prevalence of oral health problems.[2,3] Data from Basic Health Research (Riskesdas)[4] revealed the prevalence of dental caries at 88.8% with a DMF-T index of 7.1. Meanwhile, the percentage of the Indonesian population who had dental and oral problems was approximately 50% and people who had taken treatments was only about 10%, as well as those who sought treatments at the dentist was only about 15%. Based on the data, public dental health improvement remains a fundamental necessity in Indonesia.[5] Many factors affect dental health condition which is still insufficient. Therefore, improving the low level of dental and oral health is not possible without improving the influencing factors, including oral health literacy, health service providers and policy makers.[6]

Oral health literacy (OHL) is currently getting a lot of attention in order to support the improvement of poor dental health. Health literacy is an emerging focus of many public health research and has been determined to be an important predictor of health outcomes.[7] OHL has been shown to be important in reducing oral health disparities and promoting better oral health.[8] OHL is defined as the extent to which an individual has the capacity to obtain, process and understand basic health informations and services needed to make proper decisions for their oral health.[9] Individuals with insufficient OHL were reported to have a higher risk for dental and oral diseases.[10]

Parents with low literacy levels generally have less knowledge about children's oral health or disease prevention practices.[9,11] Several studies suggested that mothers' OHL levels are related to their children's oral health.[12-14] Mothers with high OHL levels have children who are less likely to develop dental caries. Improving mothers' OHL can help strengthen their capacities to improve oral health, thereby helping to improve their children's oral health and reduce inequalities.[12] Mothers' knowledge and positive behavior towards oral health care are essential in preventive dentistry since it is the crucial thing that can support the children's oral hygiene.[15] Mother's behavior and habits can be imitated by children, but knowledge alone is not enough to be followed by the right attitudes and actions. [16]

In the epidemiology of oral health, sociodemographic factors such as: gender, social class, educational level, income and occupation are the strongest determinants of oral health outcomes.[17] Education influences changes in attitudes and behavior towards health. Parents with higher education will absorb more easily information and apply it in life, for example parents can keep their teeth clean regularly.[18] The exact relation of literacy of mothers with behaviors and self-assessments of oral health has not been widely studied in Indonesia, but it has been conceptualized that there are interactions among oral health literacy and sociodemographic variables, such as ethnicity, gender, income, education, and accessibility of information regarding oral health.[11,19,20]

There are several OHL indicators, such as for recognition of words related to oral health, reading ability etc. Recent developments in the HeLD-14 instrument have covered critical decision-making factors, up to healthcare accessibility. The instrument consists of 7 conceptual domains of Access, Understanding, Support, Utilization, Economic Barriers, Receptivity and Communication.[21-23] The advantage of HeLD-14 is that it is a simple, sensitive, comprehensive, easy to use, and low-cost assessment tool that aims to find out a person's ability to seek, understand and use oral health information and then being able to access and benefit from oral health care services.[23]

Based on the explanation above, currently the condition of dental health in Indonesia is still low and the mother in the family plays a role in monitoring the dental health of her child, so it is important to have a good literacy level. There has not been much research on maternal dental health literacy studies in Indonesia, therefore researchers are interested in researching maternal dental health literacy. One area in West Java that still has high dental and oral health problems is the Pangandaran Regency. Based on previous research, Pangandaran Regency has a relatively high caries rate, with the largest caries case data obtained at the Parigi Community Health Center.[24] This study aims to analyze the level of oral health literacy of mothers and to analyze the relationships between oral health literacy level with hygiene behaviors and oral health self-assessments, in sociodemographic scope.

METHODS

The type of research was correlational analytics with a cross-sectional approach. The research population was women in Parigi District, Pangandaran Regency, West Java Province, Indonesia. The sampling technique used was purposive sampling. Subjects obtained as many as 158 mothers with an age range of 25-34 years. The Research was conducted from April to July 2021.The inclusion criteria in the study consisted of mothers who lived in Parigi District and had visited the dentist/dental polyclinic at the Community Health Center (Puskesmas), were able to read and write in Indonesia and were willing to be the research sample and the exclusion criteria were mothers who filled out an incomplete questionnaire.

The research questionnaire consisted of four sections, the first section contained an explanation of the research objectives and informed consent. The second section was about socio-demographic information, respondents' self-identity, education, occupation, and health payment methods. The third section consisted of a questionnaire on the mothers' behavior in maintaining oral health which had five questions with the Indonesian version of the Oral Hygiene Behavior Index (OHB index) questionnaire,[25] consisted of frequency of brushing teeth, times of brushing teeth, methods of brushing teeth, toothpaste usage and tongue cleaning (the OHB index score is in the range of 0-5, with categories for bad (0-2) and good (3-5)) and self-assessment of oral health (one question to self-assess the state of their dental health with categories consisting of bad or good). The fourth section was the Health Literacy in Dentistry (HeLD-14) questionnaire, which had been adapted into Indonesia.

The HeLD-14 instrument was used to measure the level of oral health literacy which covered 7 conceptual domains of Access, Understanding, Support, Utilization, Economic Barriers, Receptivity and Communication. Each item was assessed using a 5-point Likert scale ranging from 0 ("unable") to 4 ("able without difficulty") with a score range of 0-56, higher scores indicated higher levels of oral health literacy.[21,22] The HeLD-14 questionnaire consists of 14 questions and each domain is represented by 2 questions, with bad (0-28), and good (29-56) categories.

The process of adapting the questionnaire according to Beaton et al. began with forward translation, which is the process of translating the original questionnaire into the target language. The second stage was to perform backward translation, the process of translating the questionnaire back into the original language of the questionnaire. The results of the backward translation were then compared with the original scale, whether there were differences in meaning in the translation results. The next stage was a discussion with a panel of experts, in this case it could be with the original test makers, linguists, survey experts, or those who mastered the concept of the compiled tests.[26]

The instrument validity test in the research was conducted by means of a content validity test through expert opinions to determine the relevant items for the instrument with the recommended number of experts being 3-20 people.[27] The panel of experts selected were 3 people from the Department of Dental Public Health, Faculty of Dentistry Universitas Padjadjaran. The panel of experts rated each item using a 4-point scale to avoid neutral points, the four points were 1=not relevant, 2=somewhat relevant, 3=moderately relevant, and 4=very relevant. Testing the validity for each item, the Content Validity Index for Item (I-CVI) was calculated as the number of experts who give 3 or 4 points, divided by the total number of experts. Content Validity Index for Scales (S-CVI) was calculated using the average I-CVI value with the recommended minimum S-CVI value of 0.80 to be declared valid.[27,28] The results of the validity test informed that contents were valid with

a mean I-CVI value of 0.95, while the results of the I-CVI scores for each item were considered relevant by the 3 experts who gave a value of 0.95.

The reliability test of the instrument would be carried out with a test-retest which was done by testing the instrument several times on the respondent; in this case the instrument and the respondent were exactly same, but in different times.[29] Reliability test was performed on items that were included in the valid category and was performed 2 times using the same questionnaire with a different time span for 1 week on 30 respondents. Evaluation of the reliability test was carried out by calculating the value of Cronbach's alpha, which was used to assess the internal consistency of the instrument. The overall value for the Cronbach's alpha coefficient was 0.834, the Pearson test-retest had a value of 0.878 with a significance of $p<0.05$, these values indicated a satisfactory level of reliability for the instrument.

Analysis of the relationships between oral health literacy with oral health behavior and oral health self-assessments was performed using the Pearson correlation test. Independent sample t-test was conducted to assess the comparison of literacy scores in the different sociodemographic groups of mothers.

RESULTS

The results of the research on sociodemographic data of the respondents showed in Table 1-5.

Table 1. Characteristics based on sociodemographic aspects, literacy levels, oral hygiene behaviors and self-reported oral health status (n=158)

Sociodemographic Category	n	%
Education		
Finished 12-years compulsory education	122	77.2
Did not finish 12-years compulsory education	36	22.8
Employment		
Employed	67	42.4
Unemployed	91	57.6
Payment		
National insurance/BPJS	76	48.1
Personal Funds	82	51.9
Literacy levels		
Good	153	96.8
Bad	5	3.2
Oral hygiene behaviors		
Good	120	76.9
Bad	38	24.1
Self-reported oral health status		
Good	87	55.1
Bad	71	44.9

The results of the research on sociodemographic data of the respondents showed in Table 1. Most of the respondents (77.2%) had finished 12 years of compulsory education, the majority of respondents were unemployed (57.6%) and most paid with personal funds (51.9%). Most of the levels of oral health literacy, oral hygiene behaviors and self-reported oral health status were in the good or bad category.

Table 2. Characteristics based on oral hygiene behaviors (n=158)

Category	n	%
Brushing Frequency		
Correct	157	99.4
Incorrect	1	0.6
Brushing Times		
Correct	7	4.4
Incorrect	151	95.6
Brushing Methods		
Correct	81	51.3
Incorrect	77	48.7
Toothpaste Usage		
Correct	158	100
Incorrect	0	0
Tongue Cleaning		
Correct	91	57.6
Incorrect	67	44.9

Table 2 presents a description of the mothers' behaviors in maintaining cleanliness by brushing their teeth. Most respondents had good behaviors in maintaining oral hygiene, but in regards to brushing time, many respondents did it incorrectly (95.6%).

Table 3. Averages of total score and scores of each domain in oral health literacy (n=158)

Variable	Domain	Mean	SD
Total literacy score		49.63	7.16
	Receptivity	6.92	1.53
	Understanding	7.16	1.57
	Support	6.73	1.73
	Economic Barrier	7.28	1.21
	Access	7.06	1.47
	Communication	7.03	1.55
	Utilization	7.45	1.12
Behaviors		3.13	0.82

The results in Table 3 show the average total score of OHL is 49.63±7.16 and the average score of mothers' behaviors in maintaining oral hygiene is 3.13±0.82.

Table 4. Correlations of oral health literacy with oral hygiene behaviors and self-reported oral health status (n=158)

Variable	Coefficient of Correlation with OHL (r)	p-value
Oral hygiene behaviors	0.16	0.04
Self-reported oral health status	0.21	0.01

In Table 4, the result of the Pearson correlation test between oral health literacy and oral hygiene behaviors showed a low correlation value (p=0.04; r=0.16). which implied that there was a significant relationship. The test between oral health literacy and self-reported oral health status resulted in low correlation value (p=0.01; r=0.21) as well, meaning that there was a significant relationship.

Table 5. Characteristics based on sociodemographic aspects and comparisons of average OHL scores (n =158)

Characteristic	n	%	OHL Score Mean	OHL Score SD	t	p-value
Level of Education						
Finished 12-years compulsory education	122	77.2	50.38	6.537		
Did not finish 12-years compulsory education	36	22.8	47.11	8.608	-2.44	0.01
Employment Status						
Employed	67	42.4	50.82	7.449		
Unemployed	91	57.6	48.76	6.859	-1,80	0.07
Healthcare Payment						
National Insurance/BPJS	76	48.1	49.38	7.930		
Personal funds	82	51.9	49.87	6.417	0.42	0.67

The results of the independent sample t-test between OHL scores and respondents' characteristics based on sociodemographic aspects are shown in Table 5. The test results showed that there was a difference between the average OHL scores of respondents who finished 12 years of compulsory education compared to those who did not (p=0.01), but presented no discrepancies in the average OHL scores based on employment status and healthcare payment methods (p>0.05).

DISCUSSION

Oral health literacy has become an emerging public health problem and is seen as an important indicator of progress in oral health.[30] In this study, the instrument used was Health Literacy in Dentistry (HeLD-14) to assess maternal oral health literacy. The advantage of the HeLD-14 is that it is a simple, sensitive, comprehensive, easy-to-use and low-cost assessment tool. HeLD-14 consists of 14 items representing 7 conceptual domains of Communication, Access, Receptivity, Understanding, Utilization, Support, and Economic Barrier.[22]

The results of the research for the characteristics of respondents based on sociodemography of a number of 158 mothers showed that most of the mothers as respondents had a good level of education and were not working, financing their own health. The level of literacy and oral hygiene behavior of the mother is adequate. The mother's self-report about her dental health was in the good category (Table 1). The role of a mother in her child's dental health is as a motivator, educator, and facilitator.[31] Mother's oral health literacy is beneficial for children's dental and oral health, because it indicates that they have learned about dental and oral diseases and how to prevent them, and they are able to carry out prevention and interact directly with the health care system.[8,32] Inequality in various sociodemographic aspects can also affect literacy.[33]

Most of the respondents' oral hygiene behavior levels were in the good category (Table 2). Data on tooth brushing behavior results show that the frequency of brushing teeth, the method used, the use of fluoride toothpaste and cleaning the tongue have been carried out well, but most respondents still brush their teeth not at the right time (morning after breakfast and at night before going to bed). Mothers mostly brush their teeth following the routine of bathing in the morning and bathing in the evening. The results of this study are in line with the research of Suryanti, et al[25] which states that as many as 85.3% of respondents have brushed their teeth twice or more a day, but brushing their teeth has not been done in a timely manner. Poor dental health behavior is one of the causes of low dental health in Indonesia. The results of a 2018 study in Indonesia, the majority of mothers (98.3%) had good behavior in maintaining dental and oral hygiene, namely brushing their teeth every day, but not at the right time. The results showed that only 3.2% of mothers brushed their teeth correctly.[34]

The results in Table 3 of this study show that most of the mothers' dental and oral health literacy levels are in the good category, namely the mother's ability to fill out questionnaires or answer questions, economic ability to pay for treatment, knowledge to gain access to healthcare and dentist, the ability to carry out dentist instructions is considered good. Of the seven domains' mean score, there are two domains whose scores are not as high as the other 5 domains, namely receptivity and support; for acceptance some respondents stated that they did not understand when was the right time to go to the dentist, most of the respondents assumed that they would go to the dentist only if they were sick. On the Support section, they state that it's easy to ask family/friends for help, but sometimes it's hard to find the right time.

Self-reported dental and oral health status was also included in the good category. Respondents rated their dental and oral health as good, while no teeth were sick. This self-assessment is important to detect whether there are abnormalities in the teeth and mouth, so that if abnormalities are found, the patient is expected to immediately visit the dentist. Individuals who perform preventive dental care more frequently and visit the dentist for basic care until their dental problems are resolved tend to have higher OHL.[35]

The results of the correlation test between dental and oral health literacy and self-reported dental and oral health status show that the two variables are significantly correlated, meaning that mothers who have good OHL also have good behavior in dental and oral hygiene practices. This study agrees with Ueno et al. and Ying et al. which states that there is a positive relationship between dental and oral health literacy and dental and oral health behavior.[36,37] The results of a comparison between the average OHL scores with educational levels show that there is a significant difference, meaning that respondents who have completed the 12-year compulsory education and those who have not completed it have different levels of literacy. Individuals with a higher level of education tend to know about oral health, so that a higher level of education can lead to a higher level of dental and oral health knowledge. A highly educated person will easily obtain, read and understand information on health services and improve their health.[38] This is in accordance with the results of a study by Baskarados et al.[39] which shows that individuals with low levels of education have insufficient levels of OHL. The effectiveness of individual educational status is able to improve dental and oral health status.[40]

The results of the study also showed that there was no significant difference of OHL scores between working and non-working mothers. This is in line with Ueno et al[41] research which states that the employment status variable shows no significant relationship between employment status and the unemployed subject group (housewives) at the level of dental and oral health literacy. An employed person has a higher tendency to take advantage of health services compared to the unemployed one. Employment is one of the important factors that is closely related to income. Some literature sources showed that income has a positive relationship with the utilization of dental health services.[33] In the case of unemployed mothers in Parigi District, Pangandaran Regency, this is made possible because of community service facilities such as active and routine services. Organizing a Community-based preventive and promotive care (Posyandu) which allows every mother to get dental and oral health knowledge through counseling.

The results of the correlation test between literacy and self-assessment show that there is a significant relationship between the two variables, meaning that mothers who have a good level of literacy will have good dental and oral health according to their self-assessment. This research parallels the research of Khajuria et al.[42] which stated that a higher level of oral health literacy could be associated with better oral hygiene conditions. Another study stated that there was a significant relationship between oral health literacy and oral health status.[41,43,44] Respondents considered that the health of their mouths were in good condition while neither claimed to be sick. This self-assessment is important to detect whether there are abnormalities in the teeth and mouth, therefore, if abnormalities are found, the patient is expected to immediately visit the dentist. Individuals who perform preventive dental care more frequently and visit the dentist for basic care until their dental problems are resolved tend to have higher OHL.[35]

The drawback of this study is that the sample may not be representative of mothers in various regions in Indonesia, but it can serve as an example of mothers who use healthcare services at the Community Health Center. Further research needs to expand the sample coverage with the characteristics of the mother in terms of age, distance from the nearest health facility, number of visits and visit motives, as well as dental and oral health knowledge in order to obtain more comprehensive results. In addition, the reported dental health assessment is based on self-assessment so that it is possible that there may be discrepancies with the actual situation, as due to the current COVID pandemic, clinical examinations cannot be carried out.

CONCLUSION

Mothers' oral health literacy level is in good category and there are relations between oral dental health literacy with oral hygiene behaviors and self-reported oral health status.

Author Contributions: NS; methodology: NS, TM, and ASS.; validation: NS, ASS, and AGS; formal analysis: NS, TM and ASS.; investigation: TM; resources: TM and NS; data curation: NS and TM writing original draft preparation: TM; writing review and editing: NS and ASS; visualization: TM and NS supervision: NS and ASS.; project administration: TM and NS; funding acquisition: TM.
Funding: This research received no external funding.
Institutional Review Board Statement: The research permit was obtained from the Padjadjaran University Research Ethics Commission No. 367/UN6.KEP/EC/2021.
Informed Consent Statement: Informed consent was obtained from all subjects involved in the study. Written informed consent has been obtained from the patient(s) to publish this paper.
Data Availability Statement: No data available due to privacy restrictions.
Conflicts of Interest: The authors declare no conflict of interest.

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