ORAL HEALTH LITERACY OF WOMEN IN MALANG CITY, INDONESIA

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Abstract. Dental and oral health literacy in the last few decades has received special attention in the fields of medicine and public health. Health and literacy are the two main areas in the development of human beings in the world. Both areas have been recognized as important elements in improving quality of life. Therefore, special attention is needed in terms of dental and oral health especially for women since certain condition such as pregnancy are related to periodontal diseases. This study aimed to analyze the determinants of oral health literacy (OHL) of women in Malang City, Indonesia. This study was a cross-sectional study involving 177 women. The data collection employed the HeLD-29 items questionnaire which was conducted by interviewing the respondents. The descriptive percentage was utilized in univariate analysis, while the non-parametric Mann-Whitney U-test and Kruskal-Wallis test were used in bivariate analysis. Based on the results of Kruskal-Wallis test, women living in different sub-districts had significantly different in OHL scores (p=0.028). However, there were no significant differences in other sociodemographic variables such as age, education, monthly income and last visit to the dentist. Future studies are needed to find appropriate interventions to improve oral health literacy and raise awareness about the importance of going to the dentist, especially in women living in sub-districts who have lower OHL scores.

Keywords: oral health literacy, women, HeLD-29 items oral health literacy, women, HeLD-29 items

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INTRODUCTION

One of the unique and invaluable assets in the integrated component of a person's overall health and quality of life is a healthy mouth, where good oral health is a basic human right (Batista *et al*, 2017; Glick *et al*, 2012; Jin *et al*, 2016). On the other side, the mouth is also a crucial touchpoint with the external environment and is very important for the integration of the voice and appearance of the individual (Batista *et al*, 2017). It is estimated that close to 3.5 billion people worldwide suffer from various types of oral diseases (WHO, 2022). Therefore, oral disease is recognized as a major global health burden, having a major impact on people's daily life and economic deployment, with millions of school and work hours lost every year worldwide (Batista *et al*, 2017). The results of the 2018 Basic Health Research show that cavities/broken/sick teeth were still the major oral health issues in Indonesia with as much as 45.3% (Ministry of Health, 2019). Furthermore, as many as 14% of the population experience problems with swollen gums/abscesses which were the most common disorders suffered by the community (Ministry of Health, 2019). It is known that 57.6% of the population experience dental and oral diseases, but only 10.2% receive treatment from medical personnel (Ministry of Health, 2019). Some of these dental and oral diseases can cause functional limitations, psychological discomfort, or social disability and consequently can affect the quality of life (Fakheran *et al*, 2020). However, oral health is often neglected (Batista *et al*, 2017).

Dental and oral health literacy in the last few decades has received special attention in the fields of medicine and public health (Afshar *et al*, 2020). The relationship between health and health literacy has been described in several previous studies, where health literacy is associated with high utilization of urgent health services (hospitalization and emergency department) as well as low utilization of promotive and

preventive health services, low medication adherence, and increased morbidity and mortality in old people (Holtzman *et al*, 2017). In dental health, increasing oral health literacy can improve dental and oral hygiene in individuals (Lee *et al*, 2012). Oral health literacy is the way that provides information, education, and skills for oral health improvement (Niranjan *et al*, 2017).

Two main fields in the development of woman in the world are health and literacy. Both fields have been acknowledged as important components in improving women's quality of life (Mayuzumi, 2004). Women are at high risk of inadequate health literacy (Apolinario *et al*, 2012). Therefore, special attention is needed in terms of dental and oral health in women because of biological and physiological differences with men. Some studies showed that X-chromosome is linked to dental caries (Vieira *et al*, 2008; Zang *et al*, 2013). This mean that women (XX-chromosome) are more likely to experience dental caries than men (XY-chromosome). Also, female sex hormones are implicated in the changes in periodontal conditions (Jafri *et al*, 2015). Puberty, pregnancy, and menopause are examples of events that should be given more attention because these conditions are known to alter the overall health status of women (Marla *et al*, 2018). Women (especially low-income groups) do not understand that poor oral health might affect overall health (Maybury *et al*, 2019). As a result, they do not seek and receive treatment and do not receive counseling that can improve their own oral health. Women are generally better at taking care of their oral health, but despite that, there are still disparities in oral health outcomes. It seems like good dental hygiene doesn't always guarantee good oral health - women are experiencing other obstacles in maintaining oral health that cannot be overcome. Therefore, it is necessary to know about oral health literacy (OHL) in women in order to determine an effective approach in providing education to prevent dental and oral diseases (Vamos *et al*, 2019).

On this basis, this study aimed to analyze the determinants of oral health literacy (OHL) of women in Malang City, Indonesia.

MATERIALS AND METHODS

This study was a quantitative descriptive study with a cross-sectional study approach. The population in this study was women who lived in Malang City during the study. Based on a report from Central Bureau of Statistics (2020), the number of women in Malang City, Indonesia was 423,909. The calculation of the minimum sample size followed the Yamane's formula (Yamane, 1973) as below:

$$n = N/(1 + Ne^2)$$

where n = sample size

N = number of women populations in Malang (in this study, it was 423,909)

e = acceptable error value (10%)

As a result of the calculation above, the minimum sample size required was 100 respondents.

The sampling technique used in this study was multistage cluster random sampling based on the sub-districts (Kedungkandang, Sukun, Klojen, Blimbing, and Lowokwaru sub-districts). The collecting data process took place in the Public Health Center in each sub-district. We informed the research objectives and the process. The informed consent was obtained from the participating women.

Data collection was carried out through questionnaires and interviews. The instrument used to measure OHL was HeLD-29 which

has been translated into Indonesian (Wimardhani *et al*, 2019). HeLD-29 consists of 29 questions grouped into 7 indicators, including receptiveness, understanding, support, economic constraints, access, communication, and utilization. Each question item was given the scores based on a 5-point Likert scale ranging from 0 (unable to do) to 4 (without any difficulty) with scores ranging from 0-116.

Univariate and bivariate analyses were used to examine the data. The descriptive percentage was utilized in univariate analysis, while the non-parametric Mann-Whitney U-test and Kruskal-Wallis test were used in bivariate analysis.

The Health Research Ethics Committee of the Health Polytechnic of the Ministry of Health Malang approved all research procedures (Reg No.: 136 / KEPKPOLKESMA/ 2021).

RESULTS

Even though the sample size calculation resulted in a minimum of 100 respondents, the process of collecting data was done independently by 2-3 enumerators in each sub-district. Finally, we gained 177 respondents.

The HeLD questionnaire was completed by all the participants. The demographic characteristics of the respondents including age, educational background, monthly income, and district of residence were collected and reported in Table 1. For age, it was found that most of the respondents aged between 25-50 years (n = 97, 54.8%). More than one-third of the respondents had a high school or equivalent education (n = 63, 35.6%). In terms of income, the largest group of respondents, 88 individuals (49.7%), had a monthly income of IDR 1.5-2.5 million. As for the residency, about 24.9% (n = 44) of respondents were from the Kedungkandang sub-district.

Table 1

OHL scores among various sociodemographic characteristics of women respondents living in Malang City, Indonesia (N = 177)

Variable	Frequency *n* (%)	Receptiveness domain score mean ± SD	Understanding domain score mean ± SD	Support domain score mean ± SD	Economic constraints domain score mean ± SD	Access domain score mean ± SD	Communication domain score mean ± SD	Utilization domain score mean ± SD	OHL score mean ± SD
Age (years old)									
<25	38 (21.5)	3.99 ± 0.74	3.98 ± 1.14	3.99 ± 1.15	3.73 ± 0.75	3.84 ± 1.10	3.83 ± 0.89	3.86 ± 0.81	3.89 ± 0.81
25-50	97 (54.8)	3.88 ± 0.61	3.85 ± 1.00	3.86 ± 1.02	3.53 ± 0.73	3.63 ± 1.13	3.52 ± 0.92	3.64 ± 0.88	3.68 ± 0.68
>50	42 (23.7)	3.96 ± 0.65	4.20 ± 1.05	4.24 ± 1.01	3.64 ± 0.68	3.76 ± 1.07	3.77 ± 0.85	3.60 ± 0.92	3.86 ± 0.70
p-value		0.368	0.115	0.089	0.289	0.557	0.133	0.393	0.073
Last education									
No school	2 (1.1)	3.80 ± 0.85	4.00 ± 1.41	4.00 ± 1.41	3.50 ± 0.71	3.50 ± 1.41	3.07 ± 0.51	4.50 ± 0.35	3.69 ± 0.78
Elementary school	56 (31.6)	3.85 ± 0.66	3.88 ± 1.05	3.90 ± 1.06	3.66 ± 0.68	3.87 ± 1.06	3.68 ± 0.89	3.81 ± 0.85	3.80 ± 0.69
Middle school	35 (19.8)	4.05 ± 0.62	4.12 ± 0.93	4.12 ± 0.93	3.68 ± 0.64	3.68 ± 1.10	3.58 ± 0.94	3.69 ± 0.94	3.81 ± 0.69
High school	63 (35.6)	3.91 ± 0.63	3.94 ± 1.10	3.95 ± 1.11	3.53 ± 0.79	3.63 ± 1.16	3.67 ± 0.90	3.59 ± 0.87	3.74 ± 0.74
College	21 (11.9)	3.96 ± 0.72	3.95 ± 1.09	4.00 ± 1.10	3.51 ± 0.81	3.57 ± 1.15	3.63 ± 0.95	3.50 ± 0.88	3.72 ± 0.77
p-value		0.687	0.901	0.932	0.836	0.776	0.841	0.170	0.986

Table 1 (cont)

Variable	Frequency *n* (%)	Receptiveness domain score mean ± SD	Understanding domain score mean ± SD	Support domain score mean ± SD	Economic constraints domain score mean ± SD	Access domain score mean ± SD	Communication domain score mean ± SD	Utilization domain score mean ± SD	OHL score mean ± SD
Monthly income									
<IDR 1,499,999	19 (10.7)	4.04 ± 0.55	4.09 ± 0.95	4.18 ± 0.90	3.70 ± 0.70	3.54 ± 1.14	3.71 ± 0.87	3.82 ± 0.98	3.85 ± 0.68
IDR 1,500,000-2,499,999	88 (49.7)	3.96 ± 0.65	4.04 ± 1.01	4.05 ± 1.03	3.63 ± 0.76	3.82 ± 1.08	3.80 ± 0.89	3.83 ± 0.81	3.87 ± 0.72
IDR 2,500,000-3,499,999	59 (33.3)	3.87 ± 0.66	3.90 ± 1.12	3.90 ± 1.12	3.54 ± 0.71	3.59 ± 1.20	3.47 ± 0.93	3.46 ± 0.85	3.65 ± 0.71
≥IDR 3,500,000	11 (6.2)	3.75 ± 0.73	3.45 ± 1.04	3.45 ± 1.04	3.45 ± 0.54	3.73 ± 0.76	3.19 ± 0.66	3.39 ± 1.13	3.47 ± 0.62
p-value		0.647	0.355	0.258	0.493	0.595	0.029	0.031	0.075
Sub-district									
Klojen	19 (10.7)	3.98 ± 0.58	4.16 ± 1.12	4.16 ± 1.12	3.65 ± 0.73	3.61 ± 1.01	3.64 ± 1.10	3.62 ± 1.03	3.80 ± 0.77
Blimbing	42 (23.7)	3.96 ± 0.56	4.00 ± 1.01	4.00 ± 1.01	3.53 ± 0.75	3.64 ± 1.18	3.60 ± 0.87	3.67 ± 0.85	3.75 ± 0.70
Lowokwaru	43 (24.3)	3.80 ± 0.57	3.70 ± 1.08	3.70 ± 1.08	3.49 ± 0.61	3.70 ± 1.13	3.60 ± 0.62	3.70 ± 0.70	3.67 ± 0.56
Sukun	29 (16.4)	3.88 ± 0.50	3.93 ± 1.10	3.93 ± 1.10	3.48 ± 0.63	3.58 ± 1.17	3.48 ± 0.66	3.50 ± 0.76	3.66 ± 0.53
Kedungkandang	44 (24.9)	4.01 ± 0.88	4.11 ± 0.97	4.17 ± 0.98	3.82 ± 0.84	3.91 ± 1.03	3.85 ± 1.18	3.80 ± 1.06	3.94 ± 0.91
p-value		0.230	0.392	0.248	0.038	0.667	0.101	0.235	0.028

Table 1 (cont)

Variable	Frequency *n* (%)	Receptiveness domain score mean ± SD	Understanding domain score mean ± SD	Support domain score mean ± SD	Economic constraints domain score mean ± SD	Access domain score mean ± SD	Communication domain score mean ± SD	Utilization domain score mean ± SD	OHL score mean ± SD
Last visit to the dentist									
More than 1 year	158 (89.3)	3.93 ± 0.65	3.97 ± 1.04	3.98 ± 1.05	3.61 ± 0.74	3.71 ± 1.10	3.65 ± 0.92	3.68 ± 0.88	3.77 ± 0.72
Less than 1 year	19 (10.7)	3.83 ± 0.65	3.89 ± 1.12	3.96 ± 1.08	3.53 ± 0.58	3.67 ± 1.15	3.62 ± 0.79	3.64 ± 0.87	3.72 ± 0.64
p-value		0.482	0.839	0.988	0.429	0.998	0.701	0.945	0.602

Significantly different at *p*-value <0.05

IDR: Indonesian Rupiah; OHL: oral health literacy, SD: standard deviation

The oral health literacy of the respondents was analyzed according to their education, income, and district of residence (Table 1). The group of respondents who attended junior high school or equivalent had the highest literacy score (3.81 ± 0.69). Similarly, the group of respondents with a monthly income of IDR 1.5-2.5 million had the highest literacy score (3.87 ± 0.72), while the lowest score (3.47 ± 0.62) was achieved by those with an income of IDR 3.5 million or higher. In terms of sub-district variable, the group of respondents living in Kedungkandang District had the highest literacy score (3.94 ± 0.91), while those living in Sukun District had the lowest score (3.66 ± 0.53). For the last visit to the dentist, it was found that women who visit to the dentist had the highest literacy score (3.77 ± 0.72).

The mean score of each HeLD domain for the sociodemographic determinants was analyzed (Table 1). Women with different income levels had significantly different in communication (p=0.029) and utilization (p=0.031) domain. Besides, women living in different sub-district had significantly different in economic barriers domain (p=0.038). The other sociodemographic variables such as age, educational background, and last visit to the dentist showed there were no significantly different scores for each HeLD domain. It was only women living in different sub-district which showed significantly different in OHL score (p=0.028).

DISCUSSION

Although it is still a relatively new concept, oral health literacy is very important in efforts to decrease disparities and improve oral health (Horowitz and Kleinman, 2012). Literacy ability is the strongest predictor affecting individual health status (Chopra *et al*, 2013). It is natural that health literacy, including oral health literacy, has now begun to be applied

as a way of thinking about health promotion and disease prevention, as well as being considered in studies, education, community programs, and health policy (Horowitz and Kleinman, 2012). In addition to OHL, gender is also defined as one of the determinants of health (Bates *et al*, 2009). Over time, many researchers have tried to study the role of gender in health. Existing literature indicates that gender has a significant effect on health behavior and access to health care. Gender norms can influence people at multiple levels (individual, social, economic, and political) contributing to health disparities between men and women (Esteban-Gonzalo *et al*, 2021). However, gender still cannot be separated from sociodemographic and economic factors that influence decision-making (Hankivsky, 2012).

In this study, only the place of residence has an influence on the OHL score. This means that the people of Kedungkandang Sub-district possess the ability to acquire, process and comprehend the basic health information and services that are necessary to make the right decisions about their health (Aljassim and Ostini, 2020). The place of residence has an impact on health conditions through the ease of accessing dental and oral health services, the number of dental health workers/dentists in the area, community policies, and even the political system in the area (Kosutic and McDowell, 2020). Several studies have stated that the living environment is one of the determinants of OHL (Batista *et al*, 2017; Mohammadi *et al*, 2018; Rasteniene *et al*, 2015; Wimardhani *et al*, 2019).

Age group is an important risk factor for oral health literacy. Although there was no difference in OHL between ages in this study, respondents aged less than 25 years and over 50 behaved more according to OHL. This shows that women who are younger and older tend to pay attention to oral health. A similar study stated that people aged 23 and 27 lack adequate health literacy (Azlan *et al*, 2021). Another study suggests that ages 25 and 45 have more difficulty with health literacy than other

age groups (Svendsen *et al*, 2020). Meanwhile, Mohammadi *et al* (2018) stated that older people have lower health literacy. The difference in the results of this study may be due to other factors such as education level (Mohammadi *et al*, 2018), where the combination of age and higher education will increase health literacy scores (Vann *et al*, 2010). A study has found an association between the financial hardship of older women and their oral health that they self-reported (Chi and Tucker-Seeley, 2013). When there are three or more financial hardships (food insecurity, food stamps, medicaid enrollment and skipped medication because of cost) were reported by older women, they were significantly more inclined to report their oral health that they thought was poor than older women without financial hardships (Chi and Tucker-Seeley, 2013).

There is no significant difference regarding OHL between high and low income in this study. However, respondents with monthly income of less than IDR 1,500,000 behaved OHL more appropriately than other income level categories. Based on Maybury *et al* (2019), women with low-income levels may be more likely to access healthcare services and utilize preventive care, which can contribute to better oral health literacy. Women with low incomes are believed to use informal health services and cheap medicines, in contrast to men who use most of their income for their own needs (Heise *et al*, 2019). In contrast, based on Afshar *et al* (2020), high income individuals are more likely to have high health literacy. Lower income is associated with a greater prevalence of the dental and oral disease (Sanders *et al*, 2009). Some population groups are indeed categorized as a high-risk group for inadequate health literacy, one of which is a low economic group (Apolinario *et al*, 2012).

There is no significant difference related to OHL behavior between respondents with different educational backgrounds in this study. However, respondents with a junior high school education or equivalent

behaved more according to OHL than other categories. This study results contradict the previous studies which stated that the higher the level of education, the higher the oral health literacy (Atchison *et al*, 2010; Jones *et al*, 2007; Mohammadi *et al*, 2018). Health literacy cannot always be judged by the number of years of study alone, in fact, there are some respondents who have high OHL even though their education is low (Apolinario *et al*, 2012). This is because the number of years spent in school has not been effective in identifying individuals who experience difficulties in understanding information on health and who are capable of making health decisions based on scientific evidence (Jin *et al*, 2016). Furthermore, health literacy itself is a fundamental dimension that has an impact on health beyond the level of education (Vann *et al*, 2010).

There was no difference in OHL in respondents who visited the dentist for either less than one year or more than one year in this study whereas previous research revealed that people who frequently visit the dentist tend to have better oral health literacy (Mohammadi *et al*, 2018). This is because by visiting a health service, one will be given exposure to dental and oral health information by health workers/dentists which affect a person's level of oral health literacy (Vilella *et al*, 2016).

Regarding routine dental visits, women were reported to have significantly more positive behavior. These results support that women have higher adherence rates than men (Hamasha *et al*, 2018). However, in this study, most respondents still did not realize the urgency of seeing a doctor for a check-up despite having a toothbrush and brushing their teeth every day. This is reflected in the high proportion of respondents who visited the dentist to get their teeth checked for more than a year and less than one year ago. According to Shah *et al* (2003), some women do have a fear of visiting the dentist due to their socioeconomic factors. For example, gender issues, obligations as housewives who often ignore their

health conditions, and stress factors. In the study of Maybury *et al* (2019), women were also reluctant to visit dental care because most of them need to do child care while receiving health services; this strongly suggests that health facilities should be able to consider how to get grants to provide child care while women can receive health services. In addition, there are still obstacles to getting medical and dental appointments, such as the lack of access to transportation which can also be another reason for women to be reluctant to visit dental care.

Although socioeconomic and demographics are determinants of health, it is impossible to change a person's age, occupation, race, or even education level to improve his/her health status. What might be done is to provide appropriate interventions to improve oral health literacy in a population (Vann *et al*, 2010), especially women with conditions that are physically and psychologically different from men (Marla *et al*, 2018). Therefore, women can improve their ability to access information and to communicate with health workers, as well as a tool to improve their health status through decisions made (Mayuzumi, 2004).

In conclusion, this study revealed that only the residence factor had a significant influence on the OHL scores. Women who lived in Kedungkandang sub-district behaved more in accordance with OHL than other sub-districts. Further research is needed regarding the existence of significant differences in oral health literacy in different places of residence (sub-districts), whether due to the ease of access to transportation, infrastructure or other sociodemographic factors. In areas with low scores of OHL, it is necessary to do appropriate interventions to increase the oral health literacy and increase awareness about the importance of routine check-up of the dental conditions to the dentists. Government support to improve health facilities for child care and

transportation access to health facilities is also important to improve OHL scores as women often have difficulty accessing transportation.

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CONFLICT OF INTEREST DISCLOSURE

The authors declare no conflict of interest.

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