

Does health literacy affect women's oral health self-care behavior? A cross-sectional study in health centers of Tabriz, North West of Iran

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Original Article

Abstract

BACKGROUND AND AIM: In public health, health literacy (HL) is rather a new conception. In this regard, oral health as a critical public health issue that affects women's health. The objective of the present study was to determine oral health self-care behavior and its relationship with HL.

METHODS: This cross-sectional study was performed on 232 women who referred to health centers of Tabriz, Iran, in 2015. Data were collected using a self-administered questionnaire including demographic characteristics, oral health behavior, and HL [assessed using the Newest Vital Sign (NVS) scale]. Data were analyzed by one-way analysis of variance, independent samples t-test, and multiple regressions.

RESULTS: The mean age of the subjects was 33.4 years [standard deviation (SD) = 8.2; range = 18-49]. The mean \pm SD of oral health self-care behavior and HL score was 4.4 ± 1.9 and 3.3 ± 2.0 , respectively. Totally, 24.6% of the participants had limited HL (57/232). Only 19.4% (45/232) of participants brushed their teeth twice daily or more, and 28.9% (67/232) had dental check-up less than 6 months ago. The HL had positive association with oral health self-care behavior ($\beta = 0.37$, $P < 0.001$). In multiple linear regression models, oral health self-care behavior was associated with HL and education level ($P < 0.001$). HL and education level explained 19.5% of the variance in behavior.

CONCLUSION: The findings of this study suggest that HL was a predictor of oral health self-care behavior in women. However, more studies are needed to confirm the results of this study. Hence, promoting oral health interventions and designing effective educational materials based on HL might be beneficial to improve oral health behavior and status.

KEYWORDS: Health Literacy; Brushing; Oral Health Behavior; Newest Vital Sign; Oral Self-Care

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The term "health literacy (HL)" was first used in the health education background about 30 years ago.¹ HL-a relatively new concept-has a leading role in health promotion and is critical to empowerment.^{2,3}

The World Health Organization (WHO) explains HL as "the cognitive and social skills which determine the motivation and ability of individuals to gain access to understand and use information in ways which promote and maintain good health".³ HL is linked to

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access, understand, and practice health information.¹ In dentistry field, awareness about the importance of HL has increased for the past 10 years. Hence, numerous efforts have been focused on adapting the concept of HL to dental practice and studies.⁴ Oral health is integral not only to general health but also to well-being and quality of life.⁵ Dental caries and periodontal disease are main dental disease and oral health problems.⁶ In a study, decayed, missing, and filled teeth (DMFT) score was 4.7 for 18-year-old and 11 for 35- to 44-year-old Iranian women.⁷ Also, the DMFT score was 5.4 in pregnant women.⁸ A study indicated that 25.0% of women had never brushed their teeth and 80.1% had never flossed.⁹

HL is a well-known intermediary between socio-economic factors, and healthy behaviors and oral health consequences in different populations.¹⁰ Some studies demonstrated that low HL was associated with oral hygiene status and oral health behaviors, and periodontal disease.^{11,12}

Women's HL and oral health behavior are essential because they affect both the women's personal health and the health of the family.¹³ Studies reported that low HL in mothers was associated with poor oral health status in their children.¹⁴ The understanding of HL and oral health behaviors are important determinant factors not only to develop health promotion programs but also to communicate skills among clients referring to health care centres. HL is the inseparable part of health care organization, however; there are relatively few researches in this field.

This study attempted to investigate effects of HL on oral health self-care behavior among women having referred to health centers.

Methods

The current cross-sectional study was carried out in health centers in Tabriz, north-west of Iran, from January to March 2015. The participants included women who were receiving routine maternal and child preventive care like checking and monitoring

child growth and immunization. The service of providing primary health care has been developed in Iran since 1970.¹⁵ Tabriz is the third largest city in Iran and the center of East Azerbaijan province.¹⁶

The sample size was calculated 270 participants based on 20% prevalence of limited HL (from pilot study), level of confidence ($Z_{\alpha/2} = 1.96$), 5% level of precision, and non-response rate (estimated to be 20%).

The inclusion criteria were willingness to take part in this survey, age ≥ 18 years, being skillful at reading and writing, and not experiencing specific emotional and mental diseases.

The applied sampling method was random multi-stage stratified to select participants. Firstly, 8 centers were randomly chosen from 4 districts of Tabriz (north, south, east, west). Secondly, from each center, 20 to 35 eligible women were randomly included based on the ratio of women referred to each center. Finally, 270 representative eligible women participated in this study.

All of the women participated voluntarily, and the participants were provided with an explanation about the objective of the study, and informed written consent was obtained. To avoid any data collection bias, a trained public health nurse had the responsibility for data collection. Isfahan University of Medical Sciences, Isfahan, Iran, approved the study's protocol. A three-section self-administered questionnaire was used to collect data. It consisted of demographic characteristics, oral health self-care behavior, and HL. Demographic characteristics included age, education level (primary school, middle school, high school, diploma, and university), occupation, marital status, self-reported economic status (poor, average, good), and the number of residents at home.

The oral self-care behavior was measured with three items derived from the available literature.^{15,17} The items included "frequency of tooth brushing" (0 = irregularly or never, 1 = less than once daily, 2 = once daily, 3 = twice daily or more), "frequency of

flossing" (0 = irregularly or never, 1 = less than once daily, 2 = once daily or more), and "time of your last dental check-up" (0 = never/do not remember/more than two years ago, 1 = one to two years ago, 2 = six months to one year ago, 3 = within six months). The score ranged from 0 to 8. Moreover, a higher score meant a higher oral self-care behaviour. Ten expert panels confirmed the content validity of study questionnaire.

The mean content validity index (CVI) and the mean content validity ratio (CVR) were 0.71 and 0.80, respectively. HL was measured using the Newest Vital Sign (NVS) instrument developed by Weiss et al.¹⁸ The NVS consisted of six items. Every correct response was scored 1, and the incorrect or "do not know" responses were scored 0. Scores were summed to give a total range from 0 to 6. The NVS scores were divided into three HL categories: limited HL (range: 0-1), intermediate (range: 2-3), and adequate (range: 4-6).¹⁹ In the Persian version of NVS which was culturally adapted by Javadzade et al.,²⁰ Cronbach's alpha for reliability was 0.71. In this study, scale reliability (Cronbach's alpha) was 0.80. According to recommendations, the NVS is relatively acceptable to assess HL in health care setting. It is a fast screening test for assessment of HL and simple to administer in different health-related settings.^{18,21}

In a pilot study, the questionnaire reliability was assessed by test-retest (2-week interval) method among 50 eligible women in a health center, and the obtained data were not included in the final analysis. The test-retest reliability coefficient was 0.77 and each questionnaire completion took approximately 6 min.

SPSS software (version 16, SPSS Inc., Chicago, IL, USA) was applied to analyse the data. Descriptive statistics were performed to examine the data (the frequency and mean). Chi-square test was used to associate between items of oral health self-care behavior and HL level. Independent samples t-test and ANOVA were applied to explore the health self-care

behaviour score in groups of categorical variables. Pearson's correlation coefficient was used to explore the relationship between HL and oral health self-care behaviour. To control confounding variables, multiple linear regression was implemented. The significance level of α was assumed 0.05 to all tests.

Results

The final analysis sample involved 232 women from 270. Thirty-eight questionnaires were omitted due to missing data. Participation rate was 86%. As shown in table 1, the mean age of the subjects was 33.4 [standard deviation (SD) = 8.2 years; median = 33 years; range = 18-49 years]. Twenty-three participants (9.9%) had primary education and sixty-four participants (27.6%) had higher education and 78.3% were unemployed. The mean \pm SD scores of oral health self-care behavior and HL were 4.4 ± 1.9 and 3.3 ± 2.0 , respectively.

This study revealed that, 24.6% of the participants had limited HL [95% confidence interval (CI) 19.1-30.1], 58 participants (25.0%) had intermediate HL (95% CI 19.4-30.6), and 50.4% had adequate HL (95% CI 43.9-56.8).

The association between oral health self-care behavior score and socio-demographic characteristics (groups of categorical variables) is presented in table 1. Oral health self-care behavior score of the women was statistically associated with HL, oral health status, education level, and employment status. Furthermore, no significant relationship was found between oral health self-care behavior and marital status.

Table 2 shows the oral health self-care behavior index and the distribution of each item. According to the results, 31.5% of participants brushed their teeth less than once daily, and 28.9% had dental check-up less than 6 months ago. Also, the results of Pearson's correlation analysis between HL and oral health showed that HL was significantly and positively associated with oral health self-care behavior ($R = 0.349$, $P < 0.001$).

Table 1. Distribution of socio-demographic characteristics, mean \pm standard deviation (SD) oral health self-care behaviour scores, and their associated factors (n = 232)

Variables	Category	n (%)	95% CI	Mean \pm SD	f or t	P
Education	Primary	23 (9.9)	6.0-13.7	3.4 \pm 1.9	15.90	< 0.001
	Middle school	32 (13.8)	9.4-18.2	3.8 \pm 2.0		
	High school	26 (11.2)	7.2-15.3	4.1 \pm 2.0		
	Diploma	87 (37.5)	31.3-43.7	4.9 \pm 2.1		
	University	64 (27.6)	21.9-33.4	6.8 \pm 2.7		
Employment	Employed	50 (21.7)	16.4-27.1	6.1 \pm 2.5	3.40	0.003
	Unemployed	182 (78.3)	72.9-83.6	4.8 \pm 2.1		
Marital status	Single/divorced	10 (4.3)	1.7-6.9	5.5 \pm 2.3	0.36	0.530
	Married	222 (95.7)	94.4-98.9	5.2 \pm 2.0		
The number of residents at home	1 to 3	28 (12.1)	7.9-16.3	5.7 \pm 3.3	0.83	0.430
	4 to 5	176 (75.8)	70.4-81.4	4.9 \pm 2.6		
	5 more	28 (12.1)	7.9-16.3	5.0 \pm 2.9		
Economic status	Poor	35 (15.0)	10.4-19.6	4.4 \pm 2.3	4.50	0.011
	Average	116 (50.0)	43.6-56.4	4.7 \pm 2.5		
	Good	81 (35.0)	28.9-41.2	5.8 \pm 2.9		
Self-rated oral health status	Poor	13 (5.6)	2.6-8.6	3.4 \pm 1.8	7.50	< 0.001
	Fair	59 (25.5)	19.7-31.0	3.8 \pm 2.2		
	Good	130 (56.0)	49.6-62.4	5.4 \pm 2.8		
	Very good	24 (10.3)	6.4-14.2	6.5 \pm 2.8		
	Excellent	6 (2.6)	0.6-4.7	6.6 \pm 2.4		
Health literacy	limited	57 (24.6)	19.1-30.1	3.7 \pm 1.6	14.20	< 0.001
	Intermediate	58 (25.0)	19.4-30.6	4.1 \pm 1.7		
	Adequate	117 (50.4)	43.9-56.8	5.3 \pm 2.2		
Variables						Range
Health literacy				3.3 \pm 2.0		0-6
Oral health behavior				4.4 \pm 1.9		0-8
Age (year)				33.4 \pm 8.2		18-49

SD: Standard deviation; CI: Confidence interval

As shown in table 3, the HL explained 12.7% of the oral health self-care (Model 1). The multiple linear regressions (Model 2), HL and education level ($P < 0.001$) were associated with oral health self-care

behavior, and explained 19.5% of the variance in behavior. The women's oral health self-care behavior was not significantly associated with other background variables.

Table 2. Showing the score of each oral health self-care item oral health behavior (OHB) index (n = 232)

Items of oral health self-care	Weight	n (%)	Health literacy (category)			P
			Inadequate [57 (24.6)]	Intermediate [58 (25.0)]	Adequate [117 (50.4)]	
Frequency of teeth brushing						< 0.001
Never or irregularly	0	7 (3.0)	5 (71.4)	1 (14.3)	1 (14.3)	
Less than once daily	1	73 (31.5)	22 (30.1)	27 (37.0)	24 (32.9)	
Once daily	2	107 (46.1)	24 (22.4)	26 (24.3)	57 (53.3)	
Twice daily or more	3	45 (19.4)	6 (13.3)	4 (8.9)	35 (77.8)	
Frequency of flossing teeth						0.002
Never or irregularly	0	107 (46.1)	35 (32.7)	33 (30.8)	39 (36.5)	
Less than one day	1	53 (22.9)	10 (18.9)	13 (24.5)	30 (56.6)	
Once daily or more	2	72 (31.0)	12 (16.7)	12 (16.7)	48 (66.6)	
Last dental check-up						0.110
More than 2 years	0	41 (17.6)	11 (26.8)	14 (34.2)	16 (39.0)	
1-2 years ago	1	50 (21.6)	16 (32.0)	13 (26.0)	21 (42.0)	
6-12 months	2	74 (31.9)	20 (27.0)	17 (23.0)	37 (50.0)	
Less than 6 months	3	67 (28.9)	10 (14.9)	14 (20.9)	43 (64.2)	

Table 3. Regression analysis to investigate relationship between oral health behaviors (dependent variable) and health literacy adjusting for socio-demographic characteristics (n = 232)

Model	Variables	Unstandardized coefficients		P	95% CI for B	VIF	Adjusted R ²
		B	SE				
1	Health literacy	0.370	0.063	0.001	0.32-0.64	1.0	0.127
2	Health literacy	0.222	0.067	0.002	0.12-0.47	1.2	0.195
	Education	0.470	0.124	0.001	0.32-0.92	1.7	

SE: Standard error; CI: Confidence interval; VIF: Variance inflation factor

Model 1 = health literacy, Model 2 = health literacy and demographic characterize factors: age, education, economic status, number of members in household, employment and marital status (insignificant factors were not presented)

Discussion

We found the clear effects of HL on participants' oral health self-care behavior. The present study showed that HL was associated with oral health self-care behavior. This finding confirms several previous studies in this field.²² A study in Japan reported the relationship between participant's oral health behaviors and oral HL.⁴ Also, according to some studies, level of HL was associated with the patient-dentist communication, dental care patterns and the dental neglect among women in North Carolina.^{11,23}

This finding is inconsistent with pervious study that reported no relationship between participants' oral health self-care behavior and HL.²⁴ This dissimilarity is probably due to using different HL instruments. Also, the majority of participants (68.7%) had adequate HL in comparison to participants of the present study.

In line with the results of other research studies,^{11,23,25} this study showed that the oral health self-care behavior was associated with education level and economic status. This finding indicated the positive effect of demographic factors on oral health. Another study also reported that sociocultural factors-education and income-are risk factors in dental caries.²⁶ Hence, to improve oral health status, both education and income need to be considered much further in prevention programs and public health practice by health care organizations.

This study revealed that women's oral health self-care behavior was associated with oral health status. This finding confirms the

previous study conducted by Naghibi Sistani et al. that reported the frequency of tooth brushing was associated with self-reported oral health status in adults aged 18-65 years.²⁵ Another study showed a positive correlation between dental care patterns (R = 0.38) and oral health status.¹¹ Another study found that oral health behavior (regular check-up, application of fluoride, and daily frequency of tooth brushing) was associated with oral health status in Japanese young adults.²⁷

This study revealed that 31.5% of participants brushed their teeth less than once daily. This result is consistent with those of previous study that showed unfavorable oral health behaviors, and revealed that "oral hygiene is in alarming situation in Iran".⁹ In oral health programs, health education is a vital component.⁴ Hence, appropriate programs are seriously needed to promote oral health behavior.

To our knowledge, this investigation was one of the few health center-based studies that investigated the HL and oral self-care behavior in the women.

This study was not without limitations. Firstly, data were collected via self-reported questionnaire which might be subject to recall and response bias. Secondly, cross-sectional investigation cannot lead to casual conclusions about HL and oral self-care. Third, the dependent variable (oral health self-care) was measured by self-reported measures and there were no clinical examinations. Despite limitations, self-assessment is a suitable, easy, valid, and cost-effective method of data collection in dental field on adolescents and adults.²⁷⁻²⁹

Conclusion

HL was a determinant of oral health self-care behavior in the participants. Based on this predictor, educational intervention seems essential to improve oral self-care behavior. Also, health professionals need to assess clients' HL in health centers, and provide appropriate educational programs through HL strategies (simply understood materials) to promote oral health behaviors.

Conflict of Interests

Authors have no conflict of interest.

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