

Oral health literacy and health behavior of primary school teachers in Babol

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ABSTRACT

Background and Objective: The school is a good place to teach the basics of life skills, including health skills. Therefore, one of the ways to improve the oral health of children is to increase the oral health literacy (OHL) of teachers. Thus, this study aimed to evaluate the OHL of primary school teachers in Babol, Iran.

Materials and Methods: This cross-sectional study was conducted out on a convenience sample of 410 primary school teachers in Babol during two academic years from 2017-2018. Data were collected using adult oral health literacy questionnaire (OHL-AQ). The oral health literacy score of teachers was divided into three groups: inadequate (0-9), borderline (10-11) and adequate (17-12). T-test, ANOVA and Pearson correlation were used to analyze the data.

Results: 78.8% of the teachers had adequate oral health literacy. The mean oral health literacy score of teachers was 13.98 ± 2.86 with a range of 2-17. Oral health literacy was higher in female teachers and teachers with higher education ($P < 0.001$). There was a significant negative correlation between oral health literacy and age of teachers ($r = -0.19$; $p < 0.001$). Teachers who assessed their oral health status as good and teachers who brushed at least once a day had higher oral health literacy.

Conclusion: Oral health literacy level of more than two-thirds of primary school teachers in Babol was adequate. Female teachers, those with higher educational level, and those with well oral health behavior had higher OHL scores.

Paper Type: Research Article.

Keywords: Teachers, Health Literacy, Oral Health, Primary Schools

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Introduction

New health systems have created new needs for their audiences and individuals must finally take on new roles to make the right decisions about themselves and their families. In this regard, one of the most effective factors is health literacy. Health literacy is defined as the ability to obtain, process, and understand the basic health information and services needed to make a proper healthy decision (1).

Although it is still not clear how health literacy affects health outcomes, many reasons indicate that many unpleasant health-related outcomes occur due to inadequate health literacy; some researchers believe that health literacy is a better predictor of health compared to variables such as age, income, employment status and educational level (2).

Oral health is part of the general body health. Therefore, the effect of oral diseases is not limited to the mouth. Studies have shown that there is a direct relationship between oral chronic infections with cardiovascular and pulmonary diseases, diabetes and the birth of preterm infants (3).

There are many external and internal factors affecting the development of oral diseases. Among the external factors, there are economic situation, lack of access to preventive and treatment care, and internal factors including personality traits and behavioral habits of oral health. Low level of oral health literacy is one of the most important and influential internal factors in the society that affects oral diseases. Low level of oral health literacy causes society members to provide preventive and therapeutic services offered by providers or information provided by health organizations to the society (4).

Regarding the concept of health literacy,

oral health literacy is defined as the individual ability to receive, criticize and understand the basic health information and services needed to obtain appropriate oral health decisions (1). Therefore, any planning and policy making about oral health programs requires knowledge and awareness about the current status of oral health literacy, oral health behaviors and personal habits.

According to National Assessment of Adult Literacy, about half of the US adults had limited health literacy for seeking and tracking health services and information (5). Nearly one-fifth of British adults had difficulty in basic health-related skills (6), and 20% of Canadian adults had low levels of health literacy (7). Also, Health literacy has been reported low in Iran. A research conducted by Tehrani Banihashemi et al. in 5 provinces of Iran showed that two thirds of adults had inadequate health literacy (8). Oral health literacy studies and other concept in health literacy show a low level of oral health literacy among elderly population and people with low education (9-11).

Naghbi et al. (2012) reported poor oral health literacy among Tehran citizens (12). Another study by Saied Moallemi et al. (2015) in Isfahan showed that the oral health of Isfahan citizens was inadequate (13).

In developing countries including Iran, there is little knowledge about oral health literacy. Therefore, further research is needed to obtain comprehensive information in this regard. The school is a good place to teach the basics of life skills, including health. The elementary school provides the first out-of-home opportunities for children. The knowledge level of the primary school teachers from the dental system and oral health along with observing the proper oral

health behaviors can play a significant role in the oral health of children. Thus, this study aimed to evaluate the OHL of primary school teachers in Babol, Iran.

Materials and Methods

This cross-sectional study is designed based on questionnaire. The study population consisted of primary school teachers in Babol who attended in this study from 2017-2018 academic year. Primary school teachers included if they did not have visual or auditory problems to complete the questionnaire and they had satisfaction to participate in the study. Sample size was calculated using the formula 1. Considering the possibility of 10% loss of samples, the selected sample size was 410, and $\alpha = 0.05$ $P = 0.4$, $Q = 0.6$, and $d = 0.05$ (12).

$$(1) \quad \left\{ n = \frac{(Z_{1-\frac{\alpha}{2}})^2 (pq)}{d^2} \right\}$$

As the total number of primary school teachers in Babol is 1520, the sample size is acceptable to generalize outcomes to all primary school teachers. Considering that 80% of primary school teachers are female, this proportion is also taken into account in the study sampling.

After obtaining permission from the education department of Babol, data collection was carried out from April 2017 to August 2017 by simple sampling. Since Babol has only one educational area, 31 schools were selected for participation thanks to the school management cooperation. Participation in the study was entirely optional and informed consent was obtained from teachers who participated in the study.

Data were collected using adult oral health literacy questionnaire (OHL-AQ). The

reliability and validity of this questionnaire have been proven by Naghibi et al. (1). This questionnaire contains 17 questions in 4 following different parts.

- 1) Reading comprehension: This part consists of 6 questions in the form of sentence completion about the relation of oral diseases with other diseases, methods for preventing tooth decay, number of teeth and time of tooth eruption. The purpose of this section is to evaluate reading comprehension skills and oral health knowledge.
- 2) Numeracy: This part contains a prescription for antibiotic consumption with two questions and an instruction of sodium fluoride mouth rinse in addition with two questions. In this part, reading, writing and calculation skills are evaluated.
- 3) Listening: In this part, you will hear 2 sentences about post extraction instruction by interviewer. This part specifies the individual's ability to listen, read, write, and time calculation.
- 4) Decision-making: This part includes three questions about common oral and dental problems (bleeding during brushing, pain and swallowing in the mouth, and the best way to stain and calculus from teeth) and two questions about the patient records. This part evaluates the reading comprehension and decision making skills. For right answers 1 score and for wrong answers, no option and no idea questions 0 score were considered. In this way, the total score of the questionnaire was between 0-17. The scores could be categorized into three groups as follows: 0-9 as adequate, 10-11 as borderline and 12-17 as adequate. The ranking criterion is categorized based on the previous study

which verified the validity and reliability of the questionnaire (1).

The criteria for completing the questionnaire were determined according to the executive constructor of the questionnaire, and quite similar to the method that used in the previous studies (1,12). In this way, the necessary explanations were given to the teachers about completion of various parts of the questionnaire by the researcher and all parts of the questionnaire were completed by the participant. The investigator observed the completion process of the questionnaire, but did not help anyone in completing the questionnaire. Only in the listening part, the text (three lines) in the post-tooth extraction procedure was read by the researcher at most two times for each participant. Then, the participant will respond after listening to the two questions in this part.

Demographic information, behavioral habits related to oral health and oral health status of the participants were also collected by a checklist at the end of the questionnaire to compare with the oral health literacy score. Behavioral habits related to oral health include the frequency of brushing, the use of toothpaste and the consumption of candied snacks. The oral health status was recorded in three groups: good, moderate and bad. T-test, ANOVA and Pearson correlation were used to analyze the data. Significant level was considered as $P < 0.05$.

Results

A total of 410 teachers were entered into the study in 2017-2018 academic year. The mean age of the participants was 42.21 ± 9.41 who had at least 22 years and at most 67 years. 78.3 percent of the teachers were female. 59.8 percent had a bachelor's degree, 22.4

percent had a master's degree, 13.4 percent had an undergraduate degree and 4.4 percent had a diploma.

The mean oral health literacy score of teachers was 13.98 ± 2.86 with a range of 2-17. 9% of teachers had inadequate oral health literacy, 12.2% had borderline literacy and 78.8% had adequate oral health literacy. The results of independent sample T-test and One-way ANOVA showed that the mean oral health literacy rate in female was higher than men and the same in teachers with higher education than teachers with lower educational levels ($P < 0.001$) (Table 1).

The highest percentage of teachers' correct answers (96.6%) were related to the numeracy part (prevention of swallowing mouth rinse) and the lowest percentage of correct answers (58.8%) related to the reading comprehension part (the time of first permanent teeth) (Table 2). The frequency calculation of the oral health behaviors showed that 92.5% of the teachers brushed at least once a day, 97.3% used toothpaste, 52% had no referring to dental care centers over the past year, 38.3% eat candied snacks at least once a day and 72.6% reported their oral and dental health as "not good".

The results of independent sample T-test and One-way ANOVA showed that the mean oral health literacy rate were higher for teachers who brushed at least once a day, teachers who ate candied snacks at least once a day and teachers who had good oral and dental health (Table 3).

Table 1: The mean oral health literacy score of primary school teachers in Babol based on demographic variables, education degree and occupation type (n = 410)

Variables	Frequency (Percent)	Mean (Standard Deviation)	P value
Gender (Sex)			
Male	89 (21.7)	12.92 (3.01)	0.001>*
Female	321 (78.3)	14.27 (2.76)	
Age Range (Year)			
22-34	108 (26.4)	14.36 (2.77)	0.001>**
35-44	129 (31.4)	14.74 (2.56)	
45-67	173 (42.2)	13.17 (2.94)	
Education Degree			
Diploma and Higher	73 (17.8)	12.27 (2.63)	0.001>**
Bachelor	245 (59.8)	14.19 (2.85)	
Master	92 (22.4)	14.75 (2.54)	
occupation type			
Teachers	385 (93.9)	13.81 (2.87)	0.001>*
Health educators	25 (6.1)	16.60 (0.81)	

* Using T-test - ** Using ANOVA

Table 2: The percentage of correct answers given by teachers to Oral Health Literacy Questionnaire (OHL-AQ)

Reading Comprehension Part	The percentage of correct answers
1- The relationship between oral and dental disease with other diseases	70
2- a) Brushing with fluoride toothpaste	93.2
2- b) Brushing at least 2 times a day	88
2- c) Avoid consumption of candied snacks	87.3
3- a) number of permanent teeth	86.6
3- b) the first permanent teeth time	58.8
Numeracy Part	
4- the time of drug use Calculation	90.2
5- the stopping time of the drug Calculation	86.3
6- prevention of swallowing mouth rinse	96.6
7- the time to eat and drink after taking mouth rinse	79.0
Listening or communicating Part	
8- Time to remove gas from mouth after tooth extraction	75.9
9- Hot food consumption time after tooth extraction	92.4
Decision-making Part	
10- The best way in case of bleeding after brushing	79.3
11- The best way after feeling pain in your mouth?	89.3
12- The best way to stain and calculus from teeth	81.7
13- I understand the sentence " I refuse the dentist responsibility of unwanted treatment results"	65.6
14- The meaning and concept of an allergy history or drug allergy?	77.6

Table 3: The mean oral health literacy score of primary school teachers in Babol Based on oral health and health behaviors (n=410)

Variable	Frequency	Percent	Mean score (Deviation Standard)	P value
brushing Frequency per day	31	7.5	12.75 (3.07)	0.01*
Less than once	379	92.5	14.11 (2.77)	
consumption of candied snacks per day	157	38.3	13.85 (2.92)	0.37*
Less than once	253	61.7	14.10 (2.74)	
Self-assessment of oral health status	112	27.4	14.43 (2.58)	0.006**
Good	240	58.5	14.03 (2.81)	
Average	58	14.1	12.96 (3.03)	
Bad				

* Using T-test

** Using ANOVA

Discussion

The aim of this study was to investigate oral health literacy level and health behavior of primary school teachers in Babol. It showed that oral health literacy level of primary school teachers in Babol is adequate and the mean score of oral health literacy of teachers was 13.98 of 17. In this study, younger teachers had higher oral health literacy and female oral health literacy was more than men. There was also a significant relationship between the teacher's education level and their oral health literacy; people with higher education level had higher oral health literacy score.

In this study, 78.3% of teachers had adequate oral health literacy, while in the Naghibi et al. study (12) in Tehran 40% of the subjects and in the Moallemi et al. study (13) in Isfahan, 53% of the subjects had adequate oral health literacy. In this study, the mean score of teachers' oral health literacy was 13.89. In Naghibi et al. (12) and Moallemi et al. (13) studies, the mean score of Tehran

citizens and Esfahan citizen's oral health literacy was 10.5 and 11.1, respectively. Since the same questionnaire was used in these studies, the results are comparable. Given the higher mean of teacher education level than total population, this difference in oral health literacy score seems acceptable. Jagan et al. conducted a comprehensive assessment of oral health knowledge among primary, secondary, and high school teachers in South India. They reported that 44% of teachers had good knowledge, 33.7% had moderate and 22% weak knowledge level. They also stated that the mean score of oral health knowledge in both genders had significant difference in different age groups at primary, secondary and high school levels. They finally stated that the mean score of oral health knowledge in primary school teachers was higher than others (14). Considering that oral health literacy was studied in this study and oral health knowledge was studied in Jagan study, it seems that teachers had a good oral health

knowledge or literacy in both studies. Of course, only primary teachers were studied in this research and the interesting point in the Jagan study is the high level of knowledge in primary teachers like this study.

According to the results of this study, the level of oral health literacy in female teachers and male teachers was both adequate. However, the mean oral health literacy in female teachers was significantly higher than that of male teachers. In Naghibi et al. (12), Moallemi et al. (13) and Ramandeep (15) studies, the mean score of health literacy in women was significantly higher than that of men.

Given the personality characteristics of the two genders, this is acceptable. Women are more likely to refer to dentistry than men because of using more information resources to preserve their beauty and care for their children (12). Also, studies in Iran have shown that women use better oral health programs (16). In other studies with different questionnaires, the gender effect was different in oral health literacy. Research in the United States and Canada (17, 18 and 11) showed that gender had no effect on oral health literacy, or Korean study (19) reported more oral health literacy in men more than women.

Studies in Tehran (12), the United States and India (14, 20 and 21) have shown that with increasing age, the desire to raise knowledge has decreased. In this study, teachers in the age group of 35-44 years had the highest health literacy levels. However, oral health literacy was good in the lower age group (22-34). It should be noted that decreasing motivation and increasing family and personal engagement following age increasing may explain the negative correlation between age

and oral health literacy in this study.

Other goals of this study include investigating the oral health literacy level in teachers with their level of education. In the present study, as with previous studies in Iran (12, 13), the level of oral health literacy has increased with the improvement of academic qualifications. People with higher education level are more likely to benefit from educational and counseling programs, and have a better understanding of their education.

In a more careful stage, this study showed that the mean score of oral health literacy in health educators (16.61) was significantly higher than teachers (13.81). This shows how the profession and occupation of people are involved in their knowledge level. In the present study, most teachers (over ninety percent) reported having brushed at least once a day. This percentage is higher than the percentages reported by the citizens of Tehran (12) and Isfahan (13). This can be attributed to the role of teachers in teaching children in their early years of socialization which leads to the observance of many appropriate behaviors, including good health behaviors by teachers.

The mean oral health literacy score for teachers who brushed at least once a day was higher than others in this study. Uneo et al. in Japan, also found that oral health literacy can affect oral health behaviors such as brushing (22). This finding was similarly found in other studies (12, 13 and 23).

In this study, more than one-third of the teachers participating in this study did not know the time of the first permanent teeth and almost the same teachers ate sweet snacks at least once a day. These deficiencies are indicative of inadequate teachers' knowledge toward development of

the childhood dental system and proper oral health diet, as well as the need for proper education and information in these areas for the school staff.

Limitations

One of the major problems of this study was entering the schools and satisfaction of the school administrators and educational staff to carry out the research project, which was coordinated and assisted by the education department of Babol.

As oral health related questions were completed by self-report, there is a possibility to report beyond reality. The results of this study on the relationship between oral health literacy and oral health behaviors should be interpreted with caution. It is suggested further studies on the clinical indexes of oral and dental teachers to compare oral and dental clinical outcomes and health literacy index.

Conclusion

The results of this study showed that more than two-thirds of primary school teachers in Babol had adequate oral health literacy level. Likewise, female teachers, young teachers and teachers with higher degrees showed the higher oral health literacy scores compared other. Also, teachers who assessed their oral health status as good and those with good oral health habits had better oral health literacy scores.

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References

1. Naghibi Sistani MM, Montazeri A, Yazdani R, Murtooma H. New oral health literacy instrument for public health: development and pilot testing. *Journal of investigative and clinical dentistry*. 2014;5(4):313-21.
2. Horowitz AM, Kleinman DV. Oral health literacy: the new imperative to better oral health. *Dental Clinics*. 2008;52(2):333-44.
3. Baur C, Comings J, Evans C, Garcia R, Horowitz A, Ismail A, et al. The invisible barrier: literacy and its relationship with oral health. *Journal of public health dentistry*. 2005;65(3):174-82.
4. Buunk-Werkhoven YA, Dijkstra A, van der Schans CP. Determinants of oral hygiene behavior: a study based on the theory of planned behavior. *Community dentistry and oral epidemiology*. 2011;39(3):250-9.
5. Institute of Medicine, Health literacy: A prescription to end confusion. Washington, DC: National Academies Press, 2004.
6. National Consumer Council, Health Literacy: being able to make the most of health. London: National Consumer Council, 2004.
7. Sabbahi DA, Lawrence HP, Limeback H, Rootman I. Development and evaluation of an oral health literacy instrument for adults. *Community Dent Oral Epidemiol* 2009; 37(5): 451-62.
8. Tehrani Banihashemi S-A, Amirkhani MA, Haghdoost AA, Alavian S-M, Asgharifard H, Baradaran H, et al. Health literacy and the Influencing Factors: A study in five provinces of Iran. *J Dev Medl Edu*. 2007;4(1):1-9.
9. Jones M, Lee JY, Rozier RG. Oral health literacy among adult patients seeking dental care. *The Journal of the American Dental Association*. 2007;138(9):1199-208.
10. Atchison KA, Gironde MW, Messadi D, Der-Martirosian C. Screening for oral health literacy in an urban dental clinic. *J Public Health Dent*. 2010;70(4):269-75.
11. Lee JY, Divaris K, Baker AD, Rozier RG, Lee SYD, Vann Jr WF. Oral health literacy levels among a low-income WIC population. *J Public Health Dent*. 2011;71(2):152-60.
12. Naghibi Sistani MM, Yazdani R, Virtanen J, Pakdaman A, Murtooma H. Oral health literacy and information sources among adults in Tehran, Iran. *Community Dent Health*. 2013;30(3):178-82.
13. Saied Mz, Haghghi M. The study of oral health literacy of Isfahan citizens . *Journal of Isfahan Dental School* .2015;12(3):268-279.
14. Jagan P, Fareed N, Battur H, Khanagar S, Bhat M. Conceptual knowledge of oral health among school teachers in South India, India. *European journal of dentistry*. 2018;12(1):43.
15. Ramandeep G, Arshdeep S, Vinod K, Parampreet P. Oral health literacy among clients visiting a Rural Dental College in north India-A cross-sectional study. *Ethiopian journal of health sciences*. 2014;24(3):261-8.

- 16.Saied-Moallemi Z, Murtomaa H, Virtanen JI. Change in conceptions of Iranian pre-adolescents' oral health after a school-based programme: challenge for boys. *Oral Health Prev Dent* 2014; 12(1): 21-8.
- 17.Sabbah W, Tsakos G, Chandola T, Sheiham A, Watt R. Social gradients in oral and general health. *J Dent Res* 2007;86(10):992-6.
- 18.Atchison KA, Gironde MW, Messadi D, Der Martirosian C. Screening for oral health literacy in an urban dental clinic. *J Public Health Dent* 2010; 70(4): 269-75.
- 19.Lee KE, Yom YH, Kim SS, Han JH. Gender differences in oral health literacy related factors among elderly people . *J Korean Acad Community Health Nurs* 2014; 25(1): 54-64.
- 20.McQuistan MR, Qasim A, Shao C, Straub-Morarend CL, Macek MD. Oral health knowledge among elderly patients. *The Journal of the American Dental Association*. 2015;146(1):17-26.
- 21.Reshmi Haridas SS, Ajagannanavar SL, Tikare S, Maliyil MJ, Kalappa AA. Oral health literacy and oral health status among adults attending dental college hospital in India. *Journal of international oral health: JIOH*. 2014;6(6):61-6.
- 22.Ueno M, Takeuchi S, Oshiro A, Kawaguchi Y. Relationship between oral health literacy and oral health behaviors and clinical status in Japanese adults. *Journal of Dental Sciences*. 2013;8(2):170-6.
- 23.Holtzman JS, Atchison KA, Gironde MW, Radbod R, Gornbein J. The association between oral health literacy and failed appointments in adults attending a university-based general dental clinic. *Community dentistry and oral epidemiology*. 2014;42(3):263-70.