

Association between health literacy and preventive behaviors of breast cancer in women

ABSTRACT

Background and Objective: Health literacy is one of the effective indicators in preventive interventions for breast cancer. In view of the relatively high prevalence of breast cancer in women, this study aimed to determine the association between health literacy and preventive behaviors of breast cancer in women.

Materials and Methods: In a cross-sectional study, 300 women referring to comprehensive health centers of Karaj in 2018 were selected through stratified cluster sampling for participation in the study. The data were collected using a demographic and background questionnaire, Health Literacy Assessment Questionnaire (HELIA) and a standard questionnaire on the adoption of preventive behaviors for breast cancer. Then, the data were analyzed using SPSS software version 20, descriptive statistics, and the Pearson correlation coefficient.

Results: The mean and standard deviation of health literacy score was 25.95 ± 15.31 out of 100. 94% (n=282) had low health literacy, 3.3% (n=10) had inadequate health literacy, and 2.7% (n=8) had adequate health literacy. Also, the mean and standard deviation of the adoption of preventive behaviors for breast cancer was 12.74 ± 3.97 of 20. The adoption of preventive behaviors for breast cancer was poor in 40% (n=120) of women, 52% (n=156) were moderate and 8% (n=24) were good. Also, the results showed that health literacy and its dimensions had a significant and direct correlation with the adoption of preventive behaviors of breast cancer ($P < 0.05$).

Conclusion: In order to promote the adoption of breast cancer preventive behaviors in women, special attention should be paid to health literacy, especially in comprehensive health centers.

Paper Type: Research Article

Keywords: Health Literacy, Breast Cancer, Prevention, Women, Comprehensive Health Centers

► **Citation:** Aghaeian N, Farahaninia M, Janmohamadi S, Haghani H. Association between health literacy and preventive behaviors of breast cancer in women. *Journal of Health Literacy*. Summer 2019; 4(2):9-17.

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Received: 2019-05-30

Accepted: 2019-06-03

DOI: 10.22038/jhl.2019.40516.1057

Introduction

Breast cancer is the most common malignant disease of women worldwide (1, 2) and accounts for 28% of all cancers (3) and is the leading cause of cancer deaths of women in developed and developing countries (2). A study of breast cancer statistics shows the prevalence of this disease worldwide. By 2020, it is estimated that there will be a 26% increase in the current rate of breast cancer (4). The number of new cases of breast cancer is projected to rise from 10 million to 15 million annually. Therefore, the incidence of the disease is increasing worldwide (5).

In the United States, nearly one in eight women has breast cancer in their lifetime (1). In developed countries, one in nine women develops the cancer (6). More than 7 million people worldwide die from cancer (7). The results of an international study on breast cancer in developing countries indicate that out of the four hundred thousand deaths from breast cancer, about 55% occur in low-income countries (8). According to the latest data from the Iranian Cancer Research Center, about 8500 new cases of breast cancer are registered each year in the country and 1400 people die of breast cancer. There are currently around 40,000 people living with this disease in the country (9). According to a recent Iranian Cancer Registry report, breast cancer is the most common cancer among Iranian women (2). Less than one percent of breast cancers occur in women younger than 25, but there is a sharp increase in the incidence of breast cancer after 30 (10). Unfortunately, the incidence age of breast cancer in Iranian women is lower than the world average (11).

Regarding the factors associated with breast cancer, some well-known etiologic factors have also been implicated in the development of breast cancer. Epidemiologic studies provide important information about risk factors for breast cancer.

The most important predisposing, generating and driving causes of cancers in all societies have a similar pattern: carcinogens and lifestyles (poor eating habits and physical inactivity). The increasing prevalence of malignancies and the need to prevent them require identification of risk factors for cancer. Since breast cancer risk factors are not easily modifiable, prevention strategies are focused on factors that can be modified. This information indicates the need for preventive strategies in the field of breast cancer (11). Thus, given the high prevalence of breast cancer and its worldwide mortality rate, prevention seems to be the best way to control it. It was evidenced that primary prevention, by avoiding known risk factors and secondary prevention, different screening methods for early tumor identification, and timely treatment can have an effective role in reducing the socio-economic damages caused by cancer in the family and society (12).

One of the indicators that can be considered as effective in disease prevention interventions, especially breast cancer, is health literacy (13). Health literacy refers to the capacity of individuals to acquire, process and understand health information and the essential services needed to make appropriate health care decisions. Health literacy can also influence knowledge, ability to follow clinical care plans and health outcomes (14). Some studies have also suggested that health literacy is effective in promoting personal responsibility for maintaining health and also in modifying one's attitude toward health. This impact sometimes arises in the acquisition of medical and health information, their understanding, their processing and interpretation and sometimes in the decision making and use of this information. It also can influence the adoption of preventive behaviors (15). Studies have shown that the weaker the

knowledge of health conditions, the lower the use of preventive services. People with limited health literacy are deprived of the ability to acquire, process and understand verbal and written information about cancer. They may also be restricted in accessing and moving to the cancer care system, making appropriate health decisions and acting on the basis of health care information (13). Various studies, low levels of health literacy have been associated with higher rates of hospitalization, lower preventive care, and higher health costs. Inadequate health literacy rates have been reported in several studies from 25% to 49% (14, 16 and 17).

In a study of 5 provinces in Iran, only 28.8% of people had adequate health literacy (18). Studies have also shown that women's health literacy is not adequate (19-21). Health literacy can help women to participate in health promotion activities and adopt preventive behaviors to maintain and improve the health of themselves and their children (22); women with less health literacy are at risk of marriage and early pregnancy and require more health care (23).

Given the effective role of health literacy in preventing breast cancer (13) and adopting preventive behaviors (15) and considering the relatively high prevalence of breast cancer in women (2, 1), this study aimed to determine the relationship between health literacy and adopting behaviors Prevention of breast cancer among women.

Methods

In a cross-sectional study, 300 women referring to comprehensive health centers of Karaj in 2018 were selected through Stratified cluster sampling for participation in the study.

First, a list of all comprehensive health centers in Karaj was prepared and then one randomly selected from each of the four clustered areas of

Karaj (centers in each region are homogeneous and 4 centers in total). In the last stage, 75 samples from each selected center were randomly selected with inclusion criteria.

According to the results of Ghaffari et al study and considering $P = 0.23$ for the prevalence of inadequate health literacy in women (16), taking into account 80% test power, 95% statistical confidence level and considering 10% probability of the samples were dropped and finally the sample size was 300.

Inclusion criteria included: willingness to enter the study, 18-65 years old, living in Karaj, reading and writing ability, Iranian citizenship and lack of self-reported mental and physical illness. Also, exclusion criteria were dissatisfaction with the continuation of work and incomplete completion of questionnaires.

The data collection tool consisted of three parts: a demographic and contextual information questionnaire including questions about age, marital status and education level, education level of a spouse, occupation, spouse occupation, and family economic status. For measuring health literacy, HELIA was used to measure the health literacy of Iranian urban population aged 18-65 years (24). The questionnaire consists of 5 main dimensions (reading, accessibility, understanding, assessment and decision making and health information use dimension) that have 33 questions and measures the above dimensions. The 5-point Likert scoring scale is used, with giving 5 (completely easy) to 1 score (completely difficult) is assigned to the quite difficult option. About the other 4 dimensions of health literacy; 5 scores were given to always, 4 scores to most of the time, 3 scores to sometimes, 2 scores to rarely and 1 score to never. The way to score in this tool is to first obtain the raw score of each individual in each domain from the sum of the algebraic scores. Then, to convert this score to the range of zero to

100, the raw score difference formula is obtained from the minimum possible score divided by the maximum possible difference of the minimum score. Finally, to calculate the total score, the scores on all dimensions of the questionnaire (based on the range of zero to 100) were summed and divided by the number of dimensions (number 5). scores 0 to 50 are considered as low health literacy, 50.1 to 66 as inadequate health literacy, 66.1 to 84 as adequate health literacy and scores 84.1 to 100 are regarded as high health literacy. Montazeri et al. has designed and psychometrically evaluated this tool and this questionnaire has acceptable validity and reliability. Reliability was acceptable (Cronbach's alpha coefficients were 72% to 89%) (24). in the present study, this questionnaire was administered to 30 women and the alpha coefficient was calculated. Cronbach's alpha coefficient was 0.83 for reading dimension, 0.81 for accessibility and 0.76 for understanding, 0.79 for assessment, 0.81 for decision making and health information use and 0.80 for the total questionnaire.

A behavior checklist developed by Kalan FarmanFarma et al. based on the Health Belief Model was also used to measure breast cancer prevention behaviors (5). This questionnaire has 5 questions. The way the questionnaire is scored is that it is always, often, sometimes and never, in the order of expressions 4, 3, 2, or 1, respectively. So, the minimum score was 5 and the maximum was 20. Based on the mean scores, the average below 50% as poor preventive behavior, 50-75% as moderate and 75-100 as good preventive behavior. The validity and reliability of this questionnaire were measured by Kalan FarmanFarma et al. (5) and its Cronbach's alpha coefficient was reported to be 0.80 (5). To determine the reliability of the present study, the questionnaire was administered to 30 women with a Cronbach's alpha coefficient of 0.81.

After observing ethical and research principles that included receiving a code of ethics from the Research Ethics Committee of Iran University of Medical Sciences (IR.IUMS.REC.1397.524), submitting an introduction to comprehensive health services centers and explaining the nature and goals of study for women participants, Informed consent was obtained from female participants and then questionnaires were provided to them.

Completing the questionnaires was self-reporting, with all women being asked to answer the questionnaire questions with complete honesty. They were also assured that all information requested in the questionnaire would be used confidentially without mentioning the individuals. The data were entered into SPSS software version 20 and then analyzed using descriptive statistics and Pearson correlation test.

Results

In total, data from 300 women were analyzed in this study (100% response rate). The mean and standard deviation age of the participants was 35.47 ± 8.82 years. 66.7% (200 people) were housewives and 92% (276 people) were married. Table 1 shows other demographic and background characteristics of the women studied. The mean and standard deviation of health literacy score in women was 25.99 ± 15.31 out of 100. 94% (282 persons) had low health literacy, 3.3% (10 persons) had inadequate health literacy and 2.7% (8 persons) had adequate health literacy. By the way, none of the women had high health literacy (Table 2). The mean and standard deviation of the rate of adopting preventive behaviors for breast cancer was 12.74 ± 3.07 out of 20. 40% (120) of women were poor, 52% (156) moderate, and 8% (24%) good at preventing breast cancer (Table 3). The results of Pearson correlation test showed that there was a significant and

direct statistical relationship between health literacy and all of its five dimensions with adopting preventive behaviors of breast cancer ($P < 0.05$). As health literacy and its dimensions increased, the adoption of preventive behaviors for breast cancer also increased. Among the two dimensions of decision making and use of health information ($r = 0/365$) and access ($r = 0/255$) had the strongest correlations and two dimensions of understanding health information ($r = 0/120$) and reading ($r = 0/122$) had the weakest correlation with adopting preventive behaviors for breast cancer (Table 4).

Table 1. Demographic and background characteristics of the women under study

Percent	Frequency	Variables	
93.20	276	Married	Marital Status
6.80	20	Divorced	
5.30	16	Reading and Writing Ability	Education Level
16.70	50	Secondary and High School	
42.70	128	Diploma	
30.70	92	Associate and Bachelor	
4.70	14	Masters and higher	
1.70	5	Illiterate	
7.00	25	Reading and Writing Ability	Spouse Education Level
19.00	55	Secondary and High School	
34.90	101	Diploma	
25.30	73	Associate and Bachelor	
10.40	30	Masters and higher	
21.30	64	Employee	
3.00	9	Worker	
66.70	200	Housewives	
1.00	3	Retired	
8.00	24	Other	

29.100	83	Employee	Spouse Occupation
32.00	92	Worker	
3.90	11	Unemployed	
6.700	19	Retired	
28.00	80	Other	
13.70	41	Undesirable	Economic Status
52.70	158	Relatively Desirable	
30.30	91	Desirable	
3.30	10	High	

Table 2. Frequency distribution of women's health literacy levels

Health Literacy Level	Frequency	Percent
Low Health Literacy	282	94.00
Inadequate Health Literacy	10	3.30
Adequate Health Literacy	7	2.30
High Health Literacy	0	0.00
unanswered	1	0.30
Total	300	100

Table 4. Relationship between Health Literacy and its Five Dimensions with Breast Cancer Prevention Behaviors in Women

Health Literacy and its Dimensions	Breast Cancer Prevention Behaviors	
	R	P-value
Reading	$r=0.122$	0.034
Access	$r=0.255$	$P < 0.001$
Understanding	$r=0.120$	0.038
Assessment	$r=0.140$	0.015
Decision Making and Using health information	$r=0.365$	$P < 0.001$
Total Health Literacy	$r=0.253$	$P < 0.001$

Discussion and Conclusion

This study aimed to determine the association between health literacy and preventive behaviors of breast cancer in women referring to comprehensive health centers of Karaj in 2017.

The results of the study indicated that the level of health literacy was low in the studied women, so that the level of health literacy in

most of the women was inadequate and not sufficient. The finding showed that limited health literacy is a common problem among women. To justify this finding, it should be noted that approximately one-third of the women in the present study had a college education. Also, the mean age of the female participants was slightly higher. Given the impact of higher education (25.26) and lower age on the prevalence of adequate health literacy (27-29), this result can be explained. The results of the Kamali et al study (30), in which more than 80% of the women studied had inadequate or borderline health literacy, appear to be consistent with the results of the present study. The results of the present study are also consistent with the results of Mihai et al (29), Ghaffari et al (16), Baghaei et al (31), Safari Morad abadi et al (32), Tehrani et al (18), Sajjadi et al (33), Karimi et al. (34), Moshki et al. (35), Peyman et al (20) and Ghanbari et al., (19) who reported moderate health literacy in women. Possible reasons for this discrepancy may be the differences between these studies and the present study, such as the tools used to measure health literacy, population groups, sample size, age, and education level of participating women.

The results of this study showed that the prevalence of breast cancer prevention behaviors was moderate in women. These results are in agreement with the results of Dafei et al. (36) and Pourhaji et al. (6), but contradict the results of Nourizadeh et al. (37) in which low-level breast cancer prevention behaviors were reported. Possible reasons for this discrepancy include differences in the means of measuring the behavior and geographical areas and cultures of the groups under study. Regarding the average level of adopting preventive behaviors in breast cancer in the present study, it can be said that due to the low levels of health literacy and its

five dimensions in the studied women, there is also a relationship between health literacy and adopting preventive behaviors (38-41). However, it was expected that the adoption of preventive behaviors for breast cancer was also at a low level, while the results showed that these behaviors were moderate. In this regard, it can be stated that the adoption of moderate preventive behaviors of breast cancer was probably due to the higher mean score of health literacy in decision making and use of health information than the average of the other four dimensions of health literacy. In other words, the low level of health literacy in the field leads to the use of information compared to other areas of health literacy which does not lead to appropriate measures in applying health knowledge (42). Consequently, the higher mean score of health literacy in decision making and use of health information than the mean scores of the other four health literacy domains may be a reason for the average level of adopting breast cancer prevention behaviors in the present study.

In the present study, there was a direct and significant correlation between health literacy and adopting preventive behaviors of breast cancer. These results are consistent with the results of studies by Mahdavi et al (29), Sentell et al (43), Oldach and Katz (44), Reisi et al (38), Scott et al (45) and Izadirad and Zareban (41). There was a statistically significant correlation between health literacy and preventive behaviors. On the possible causes of this finding, it can be said that health literacy helps individuals to be more involved in health care decisions and to pay more attention to their health status. Health literacy also plays an important role in promoting personal responsibility for maintaining one's health (46). On the other hand, the level of health literacy by increasing the understanding and evaluation of the benefits of diagnostic and

preventive behaviors in women can be one of the most important factors in adopting these behaviors (29).

According to the results of the present study, all five dimensions of health literacy have a significant and direct correlation with the adoption of preventive behaviors of breast cancer. The two dimensions of decision making and use of health information and access were the strongest and the two dimensions of understanding of health information and reading were the weakest correlated with adopting preventive behaviors for breast cancer. To justify these findings, it can be argued that health literacy is a set of skills, abilities, and capacities in various dimensions. These skills and abilities are shown sometimes in the acquisition of medical and health information, sometimes in their reading, sometimes in their understanding, sometimes in their processing and interpretation and sometimes in decision making and application. The Information has been updated (14) and can thereby influence preventive behaviors (29). In this study, these skills and abilities were probably the most influential in both decision making and access to health information. In the two dimensions of understanding health information and reading, they had the least impact on adopting breast cancer prevention behaviors.

It is worth noting that the weak correlation of the three dimensions of health literacy, namely the understanding of health information, the reading and the health information assessment with adopting preventive behaviors of breast cancer may be due to the fact that other variables besides health literacy Knowledge (47), attitude (48), education and age (39), social and family norms (49) can also influence the adoption of preventive behaviors. It can also be added that although studies have identified the relationship between health literacy and

adopting preventive behaviors, it is not likely to prove such a relationship for low levels of health literacy skills and in this way planning and designing communication interventions may be appropriate. Improving these skills can lead to establishing and repairing the relationship between them and adopting healthy behaviors.

Given that this study was conducted only among women covered by selected urban health centers in Karaj, the results of this study cannot be generalized to women in other parts of the country. Therefore, it is recommended to conduct a larger-scale study of women in the country, especially among rural women. Other limitations of this study include ignoring other aspects of health literacy, such as self-efficacy, relevance, and computation. If these dimensions are available, it is possible to examine a broader and more comprehensive assessment of the relationship between health literacy dimensions and adopting cancer prevention behaviors. Ignoring cultural backgrounds and skills such as speaking, listening, and acquiring background and cultural knowledge were also other limitations of this study. These are skills that should be considered when measuring health literacy. However, these skills are ignored not only in this tool but in other tools as well. Other limitations of this study were self-reported data collection.

Overall, the results of this study showed a moderate adoption level of preventive behaviors of breast cancer; low level of health literacy as well as a correlation between health literacy and adopting preventive behaviors of breast cancer among women participating in the study. According to the findings of this study, it can be said that limited health literacy is a common problem among Iranian women. Health literacy has also played an important role in adopting preventive behaviors for breast cancer and may

also be effective in adopting other preventive behaviors. Therefore, considering the important role of comprehensive health centers as health education bases for women, it is recommended that health literacy-focused education be provided to promote women's health information on breast cancer prevention.

Competing interests: The authors declare that they have no competing interests.

Funding: No financial support was received for this study.

Acknowledgement

This article is a partial report of a Master's Degree in Community Health Nursing approved by the Faculty of Nursing and Midwifery of Iran University of Medical Sciences. We would like to thank all dear women and respected authorities who assisted us.

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