Assessment of Health Literacy in Breast and Cervical Cancer Screening in Southwest of Iran 2022-2023

Abstract

Background

Health literacy has the strongest association with adherence to screening programs. Therefore, this study was conducted to assess the health literacy related to breast and cervical cancer screening.

Methods

It was a cross-sectional study that was approved by the ethic committee of Yasuj University of Medical Sciences. Through computer based simple random sampling, 294 women aged 20-69 years old, enrolled study from four urban health centers of Yasuj city since 2022-2023. Written informed consent was taken from all participants. Inclusion criteria were: women aged 20-69 years old, ability to read and write, consent to participate in the study. Exclusion criteria were: incomplete completion the check list and questionnaire. Data collection was done through a demographic checklist (age, education, marital and occupational status) and AHL-C (Assessment of Health Literacy in cancer screening). The data were analyzed using SPSS version 25 software by Mann-whitney, Kruskal wallis and ordinal logistic regression tests.

Results

Mean age of participants was 33±7.88 years. Mean score of health literacy related to breast and cervical cancer screening was 42.55±5.43. Level of health literacy were favorable, intermediate and unfavorable in 145 (49.3%), 116(39.5%) and 33(11.2%), respectively. Health literacy was significantly higher in participants with higher education (p= 0.0001), employed (p=0.0001) and married (p=0.023). Based on ordinal logistic regression, only the level of education was the predicting factor of health literacy (p=0.0001).

Conclusion

Given that, half of participants didn't have adequate health literacy and education level was the strongest predictor of health literacy, health policy makers and health care providers should consider interventions based on demographic characteristics such as revising/simplifying teaching materials, including oral, pictorial and written materials in the form of posters, pamphlets to increase health literacy skill in the community.

Key words: health literacy, breast cancer, cervical cancer, screening

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Background

Breast cancer is the most common known malignancy and the main cause of cancer-related death in women around the world (1). Breast cancer has long been the concern of health authorities due to its growing trend and affecting women and disintegrating the family foundation. The relatively long pre-clinical period that allows for early detection and its high survival rate in case of early detection, has made breast cancer a suitable disease for screening. The American Cancer Society has recommended breast self-examination from the beginning of the second decade of life, examination by a doctor at least every three years in the second and third decades of life, and annual mammography in asymptomatic women 40 years and older for early detection of breast cancer in asymptomatic people with average risk of disease (2). Because most types of breast cancer have a relatively good prognosis, it is one of the most preventable cancers, and despite this, it can be one of the deadliest cancers in women, which requires early diagnosis to prevent the mortality of this cancer, which is one Mammography is one of these ways that we should inform qualified women about the benefits and harms of screening methods, including mammography. Studies show that women in European countries did not have enough knowledge about the benefits and harms of screening methods, which is related to the issue of health literacy. Health literacy includes the amount of knowledge, motivation, sufficient access, understanding, evaluating and using health information to make decisions about health, prevent diseases and improve the level of health to improve the quality of life (3).

Cervical cancer is the third most common cancer and the fourth leading cause of cancer-related death in women worldwide. According to estimates in 2008, 9% of new cases of all cancers and 8% of cancer deaths in women are accounted for cervical cancer. It is estimated that 95% of women in developing countries have never been screened for cervical cancer. In Iran, although this cancer is not one of the 10 most common cancers, since it can be prevented by a vaccine and can be identified by timely screening in the early stages; it is of considerable importance. (4). It mostly affects the average age of 35-44 years and is less common in people under 20 years of age, and the 5-year survival rate is generally 66%, which is 71% in white women and 58% in black women. (5)

Population-based screening programs are known as an effective method in breast and cervical cancer detection. Studies show that screening every two years reduces the rate of breast cancer by 26% and Pap smear screening reduces the rate of cervical cancer by 80%. The effectiveness of screening programs depends on various factors. Among these factors is the socio-economic, cultural and psychological level of the patients, which is different between different people, which can be the reason for the higher mortality caused by these cancers in people who do not have these factors. The level of health literacy can be considered as a factor predicting the health status of people and a factor for the patient to make decisions about health, prevent diseases and improve their health level, and a low level of health literacy with an increase in hospitalization and there is a relationship between the increase in the amount of medicine consumed and the decrease in the use of disease prevention methods, including cancer screening (6). In the health system, in order to prevent and control diseases, along with the provision of health services, the transmission of information presented in simple language and based on appropriate content plays a significant role .These cases led to the emergence of a new concept called health literacy (7). Health literacy is defined as a person's capacity to acquire, interpret, and understand basic information and health services that are necessary for making appropriate decisions in everyday life concerning healthcare, disease prevention and health promotion to maintain or improve their quality of life (8). According to studies by the Center for Health Care Strategies in the United States, people with low health literacy are less likely to understand written and spoken information provided by health professionals and follow the instructions given, incur higher medical costs, have poorer health, They have higher rates of hospitalization and use of emergency services and less preventive care including cancer screening program (8).In a study in United States, it was shown that health literacy had the strongest association with adherence to mammography screening among sociodemoghraphic variables such as ethnicity, language, education, smoking status, insurance, income, employment and family history of breast cancer. Also, low health literacy was shown to have negative association with up- to- date breast cancer adhering to screening programs. On the other hand, the World Health Organization advocates that first step for effective strategies to promote the communities for early diagnosis is improving health literacy (8). The study of Elobaid and colleagues showed that 45% of women didn't have sufficient information about clinical breast

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exam and mammography (9). In a conducted study in women aged 14-84 years old, in Northeast of Iran, 84% of women didn't have sufficient information about breast cancer and screening methods, too (10). The finding of Baccolini et al revealed that there was a significant association between adequate level of health literacy and higher screening participation for breast, cervical and colorectal cancer (11). In the study of Danaei and her colleagues' spouse's education was the predictive factor of health literacy in women with breast cancer. The odds of a sufficient health literacy in spouse with a high school diploma was 4.33 times, and in spouse with university degree was 5.87 times more than participants that their spouse had lower than diploma education (12). The results of a study in Turkey in women in reproductive aged showed that the majority of them had low level of health literacy and their information about prevention of breast cancer was low, too (13). In the study of Rajabi et al, improvement in health literacy after educational intervention led to improvement in breast self-examination, using clinical breast examination and mammography (14). The results of Ramaswamy et al revealed that improving in cervical health literacy following intervention was associated with increased self-efficacy for cervical cancer screening and follow-up (15). Emerson noted that improvement of health literacy after intervention led to increasing in Up-to-date Pap screenings compared to pre-intervention (16). Due to the importance of the problem and limited evidence in Southwest of Iran about health literacy related to cancer screening, this study was conducted to investigate the health literacy related to breast and cervical cancer screening in Southwest of Iran**.**

Methods

It was a cross-sectional study that was approved by the ethic committee of Yasuj University of Medical Sciences (IR.YUMS.REC.1401.165). Through computer based simple random sampling, 294 women aged 20-69 years old, enrolled study. There are four urban health centers in Yasuj city. After calculating the total sample size, based on the frequency of women in each center, it was distributed in proportion. Written informed consent was taken from all participants. Inclusion criteria were: women aged 20-69 years old, ability to read and write, consent to participate in the study. Exclusion criteria were: incomplete completion the check list and questionnaire. Data collection was done through a demographic checklist (age, education, marital and occupational status) and Assessment of Health Literacy in cancer screening (AHL-C). AHL-C was developed and validated by Hae-Ra Ham and his colleagues including 52 questions in four domains: 1- print literacy (24 questions, 0-24 score), 2- numeracy (12 questions, 0-12 score),3- comprehension (12 questions, 0-12 score), and 4- familiarity (12 questions, 0-12 score). Cross-cultural adoption and Validity and Reliability of the Persian version of Health Literacy Questionnaire was done. 1) Translation process: - First stage: (Forward translation) In this stage, the original English version of the questionnaire was been translated into Persian by two official translators. - Second stage: (Incorporation) In this stage, in a meeting with the presence of the researchers, the two translated versions of the questionnaire were been reviewed and finally, with agreement, an initial joint translation was been obtained. - Stage Three (Backward translation): The joint Persian translation prepared in the previous stage by two native speakers who are fluent in both Persian and English will be translated back into English. - Stage Four: (Comparison) The two English translations obtained in the previous stage were compared by the research team with the original version of the questionnaire in terms of meaning, and the final Persian questionnaire was been obtained in this order. The content validity index was 0.97, the content validity ratio was 0.9, and Cronbach's alpha was 0.87. Also, in the confirmatory factor analysis, the CMIN/DF fit indices were 2.24, the IFI index was 0.732, the CFI index was 0.728, the HOLTER index was 0.01, and the TIL index was 0.7, and the standardization of the questionnaire was confirmed. For leveling of health literacy, the existing grading in the health literacy survey that was conducted in 8 European countries in 2011 was used. Two-thirds and five-sixths of the total possible points were considered as separate points of health literacy levels. Considering that the maximum score will be 52, a score of 0-35 was considered as unfavorable health literacy, a score of 36-43 was considered as borderline health literacy, and a score of 44-52 was considered as favorable health literacy (17).

Sample size was calculated based on the Ghanbari study (18) considering p=57% (favorable health literacy), α=0.05 and d= 0.1 p. $n= (Z_{1-\alpha/2})^2 P (1-P)/ d^2$.

The data were analyzed using SPSS version 25 software. The data were reported as mean and standard deviation, or as frequency and percentage. The normal distribution of quantitative data

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was checked using the Kolmogorov Smirnov test. Mann-whitney, Kruskal wallis and ordinal logistic regression were used for data analysis. A significance level of 0.05 was considered.

Results

294 women aged 20-69 years old enrolled study. Mean age of participants was 33±7.88 years (minimum=20 and maximum=56). Other demographic characteristics are shown in table 1.

Table 1- Demographic characteristics of participants

Variables	Frequency (%)
Education:	
- Under the diploma	55(18.7)
- Diploma	105(35.7)
- Higher than diploma	134(45.6)
Marital status	
- Single	24(8.2)
- Married	264(89.8)
- Divorced/widow	6(2)
Occupational status	
- Housekeeper	232(78.9)
- Occupied	62(21.1)
History of mammography in women aged 40 years old and higher	
- No	39(60)
- Yes	26(40)
History of pap smear in married women*	
- No	56(23.2)
- Yes	185(76.8)

* At least 3 years after marriage or from 21 years old

Mean age of first mammography and Pap smear was 36.11±7.29 and 26.77±5.73, respectively.

Mean score of health literacy related to breast and cervical cancer screening was 42.55±5.43. Level of health literacy is illustrated in table 3.

Table 2 -Level of health literacy related to breast and cervical cancer screening in participants

Level of health literacy	Frequency (%)
Unfavorable	33(11.2)
Intermediate	116(39.5)
Favorable	145(49.3)

There wasn't any significant correlation between age and health literacy score (P= 0.78, r= 0.016). According to Chi-Square test, there wasn't any significant relation between level of health literacy and history of undergoing mammography (p= 0.75, value=0.58, d_f= 2) and Pap smear (p= 0.5, value=1.23, d_f= 2).

Table 3- comparison the health literacy related to breast and cervical cancer screening based on the demographic characteristics

variables	Mean Rank	Mean ±SD#	median	Interquartile range	test*	p-value
Education:					Kruskal Wallis	0.0001**
- Under the diploma	67.84	36.83±6.05	36.5	6.5		
- Diploma	122.67	41.62±4.32	42	5.25		
- Higher than diploma	199.65	45.62±3.43	45.62	3.81		
Marital status:					Kruskal Wallis	0.023***
- Single	142.96	42.26±5.45	43.37	5.69		
- Married	190.96	45.29±4.46	45	6.94		
- Divorced/widow	173.33	44.04±5.21	45.37	10.25		
Occupational status					Mann-	0.0001

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- Housekeeper - Occupied	131.27 206.83	41.65±5.23 45.91±4.41	42.75 46.25	6.94 5.13	Whitney	

Standard Deviation

*Health literacy didn't have normal distribution (p<0.05)

** In 2*2 comparison, significant difference was between diploma and higher than diploma group (p=0.0001)

*** In 2*2 comparison, significant difference was between single and married group (p=0.008)

Predicting factors of the health literacy related to breast and cervical cancer screening based on the Ordinal Logistic Regression is illustrated in table 4.

Table 4- Predicting factors of the health literacy related to breast and cervical cancer screening based on the Ordinal Logistic Regression

	estimate	Std.Error	Sig.	95% Confidence Interval	
				Lower Bound	Upper Bound
Threshold health literacy=0	-5.57	1.30	0.00	-8.13	-3.01
	-2.74	1.26	0.03	-5.22	-0.25
health literacy=1	0.008	0.01	0.61	-0.24	0.04
Location age	-3.43	0.41	0.00	-4.24	-2.62
education=0	-1.64	0.30	0.00	-2.23	-1.05
education=1	Ref*				
education=2	-1.59	1.17	0.17	-3.88	0.7
marital status=0	-1.60	1.06	0.13	-3.68	0.48
marital status=1	Ref				
marital status=2	-0.43	0.36	0.24	-1.15	0.29
job=0	Ref				
job=1					

*Reference

Discussion

The purpose of this study was to investigate the health literacy related to breast and cervical cancer screening and its related factors.

Our results showed that nearly 50%, 39% and 11% of participants had the favorable, intermediate and unfavorable health literacy. The results of the study by Rakhshani et al showed that 83%, 14% and 3% of subjects had sufficient, borderline and inadequate health literacy, respectively (14). In the study of Rakhshkhorshid and her Colleagues, 89.6% and 10.4% of participants had limited and marginal health literacy, respectively and no participants had adequate health literacy (20). In another study conducted by Batooli et al, health literacy in half of the participants was moderate (21). Another study revealed that one-half of the women had low level of health literacy (22). Paul et al showed that over two-thirds of participants had problematic or inadequate health literacy (8).The finding of Danaie and her Colleagues, showed that 15.3% of women had inadequate health literacy (12). Except the Rakhshani study, the result of our study was approximately in line with the others. The differences in the results of the studies could be multifactorial including use of different tools to measure health literacy, cultural differences and differences in access to health care or socioeconomic status.

In present study, related determinants of health literacy were marital status, education level and employment status in univariate analysis. Women with higher education, being married/ever married and employed had higher health literacy. The education level was the only predicting factor of health literacy in multivariate analysis. In previous studies, higher educational level was significantly associated with higher cancer screening health literacy (12, 15, 19, 20, 21, 22, 23). In another studies, employment (12, 19, 20) and being married (12, 24) were significantly associated with higher health literacy score that support our findings. Given that, education level was the strongest predictor of health literacy, the necessity of conducting simplified written, audio or video

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educational materials to a reading level to improve women's health literacy must be considered, because low health literacy may also influence the source and accuracy of the information received.
The results of the study revealed that 60% of women had never undergone mammography. According to national breast cancer control and screening guidelines, women are recommended to begin screening mammography at age 40 (20) and participation in regular breast cancer screening is the recommended method to detect possible cancerous growth at the earliest stage to reduce the cancer progression and mortality (25). The Canadian Partnership Against Cancer (CPAC) set a goal to have at least 70% adherence to mammography screening and in the study of Loewen et al, 79.3% of participants had on-time screening and only 5.5% have never been screened (25). Other researchers have reported that 70% (14), 88% (19) of women had never undergone screening mammography. The results of Rakhshankhorshid indicated that none of the participants performed a mammographic screening (20). Therefore, causes of low performing screening mammography is an important issue that should be addressed by healthcare providers and policy makers. Lack of knowledge on the mammography, lack knowledge on service location, fear of radiation, fear of pain, fear of positive results, inconvenient service time and lack of time are some probable causes of not performing screening mammography (8).
Nearly 70% of participated women in present study, reported performing Pap smear. Ranaswany et al (15) and Rakhshani (19) reported 67% and 53% undergoing Pap smear, respectively. Although, performing Pap smear is higher in our study, but further investigation with focus on barriers to attending for Pap smear is necessary.
In this study, there wasn't any association between health literacy and undergoing mammography and Pap smear. The results of Goto et al was in line with our results (26). In the study of Rakhshani (19), there was a significant correlation between health literacy and performing Pap smear but there wasn't any correlation between health literacy and undergoing mammography. Given that, in some studies (8,11, 27), there was a significant correlation between health literacy and performing mammography and Pap smear, further investigation is needed with focus on barriers and reasons for non-adherence to mammography and Pap smear. On the other hand, the coronavirus disease (Covid-19) pandemic that has led to reduction in the participation rate across all type of cancer screening programs even after its controlling must be noted.
The results revealed that there wasn't any association between age and health literacy. It was in line with Rakhshani (19) result. In Haghighi (28) and Cudjoe (29) studies, a significant reverse correlation was shown between age and health literacy. A possible explanation could be that poor literacy with increasing age may be due to reduced cognitive function and sensory abilities (21). In Barati (30) and Sun studies (22), older age was significantly associated with higher cancer screening health literacy. According to discrepancy in the results of the study, further research is warranted to systematically investigate how age influences cancer screening health literacy among women.

Limitations

The researcher found a few studies that investigated the health literacy of breast and cervical cancer together. Therefore, we compared our results with the existing similar study about health literacy related to breast and cancer screening. Additionally, this study was cross-sectional and causality cannot be assumed when addressing the relationship between cancer screening health literacy and demographic characteristics.

Conclusion

Given that, half of participants didn't have adequate health literacy and education level was the strongest predictor of health literacy, health policy makers and health care providers should consider interventions based on demographic characteristics such as revising/simplifying teaching materials, including oral, pictorial and written materials in the form of posters, pamphlets to increase health literacy skill in the community. Also, promoting communication skills of health care providers should be taken into account.

List of abbreviations

AHL-C = Assessment of Health Literacy in cancer screening
CPAC= Canadian Partnership Against Cancer

Declarations

Ethics approval and consent to participate

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The present study has been ethically approved by the Iran National Committee for Ethics in Biomedical Research as (IR.YUMS.REC.1401.165). Written informed consent to participate was obtained from all the participant.

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