Health Literacy Related to Cervical Cancer among Women Referring to Health Centers of Yazd, Iran

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ARTICLE INFO	ABSTRACT
	Background & aim: High health literacy enhances informed decision-making for cervical cancer screening (i.e., a Pap smear) among women. The present study aimed to determine the health literacy related to cervical cancer in women referring to health centers of Yazd, Iran. ***Methods:*** This cross-sectional study was conducted on a total of 800 women in 2018. The study participants were selected using systematic random sampling. To collect data a valid and reliable health literacy questionnaire was used to address different aspects of cervical cancer health literacy (i.e., accessibility, reading, understanding, appraising, and decision-making). Data analysis was carried out using Pearson's correlation, independent samples t-test, and multivariate analysis of variance with SPSS software (version 20). ***Results:*** The mean age of the participants was 35.85±7.99 years. The mean score of the overall health literacy was reported as 67.46±15.59 and the mean score of the subscales of accessibility, reading, understanding, appraising, and decision-making were 13.34±4.25, 13.29±3.06, 11.25±3.56, 12.72±13, and 16.84±6.16, respectively. Also, there was a significant relationship between health literacy with age, employment status, income level, and daily consumption of fruits and vegetables (P<0.001). ***Conclusion:*** The present study indicated that women's level of health literacy in terms of cervical cancer was low in Yazd; therefore, health care providers should pay special attention to women using modern educational methods as well as appropriate educational technologies in order to enhance women's health literacy regarding cervical cancer.

Introduction

Cervical cancer was the third leading cause of gynecological cancer mortalities among American women in 2011 (1). According to the World Health Organization (WHO) report in recent years, cervical cancer is the second most common cancer in women with about half a million new cases annually, and more than half of the patients die from this disease (2). The incidence of this cancer is higher in Asia than that reported for other regions, and 80% of patients with cervical cancer are living

in developing countries (3).

According to studies performed in Iran, the incidence of cervical cancer has been reported as 4.5 per 100,000 individuals every year indicating the importance of cervical cancer among other cancers in Iranian (4).
Cervical cancer is one of the five most common cancers among Iranian women and is ranked fifth after breast, esophageal, gastric, colon, and

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rectal cancers. It is a leading cause of cancer mortalities in developing countries (5).

Cervical cancer has been recognized as preventable cancer due to a long pre-invasion period, availability of appropriate screening programs, and effective treatment of primary lesions (6). However, according to the statistics, it is indicated that more than 10% of cancers occur in women who have not been screened for the past 5 years (7). A Pap smear is a simple cytological test in the screening and diagnosis of cervical cancer and its precancerous lesion and should be performed every 3 years in sexually active women of the reproductive age (8); however, despite the simple screening, few women participate in this preventive program (9). Individuals' low level of health literacy is an important reason for their non-participation in screening programs (10).

According to the WHO's definition of health literacy, Kafami et al. (2012) referred to cognitive and social skills indicating individual motivation and ability to have access, understand, and use information in a way that preserves and promotes their health. In another definition, health literacy encompasses a set of reading, listening, analyzing, decision-making, and ability to apply these skills in health situations that are not necessarily related to years of education or general ability to read (11).

Health literacy is now recognized as a critical important index of health care outcomes and costs. The health care system requires high health literacy (12). Therefore, health literacy is more than just the ability to read books or pamphlets and other writing materials. According to the Health Literacy Committee of the Medical Association, health literacy is a public concern about individual and environmental health promotion, disease prevention and early screening, continuity of health care, and policymaking. Given the importance of health literacy role in the enhancement of social health, studies in this regard require special attention reflecting health systems' perception of the importance of health literacy impact on the utilization pattern of health services (13).

Some studies have been conducted on health literacy and its association with cancer, such as prevalent women cancers, breast cancer, and cancer screening behaviors. These studies have reported a low level of health literacy regarding the types of cancers (14-16). However, a study conducted by Bazaz et al. (2019) on the relationship between health literacy and cervical cancer in Ahvaz, Iran, indicated the low level of health literacy among women (17).

Therefore, the results of studies showed a high prevalence of cervical cancer in developing countries, its increasing trend in Iran, role of screening methods in the early diagnosis of this cancer and its mortality, importance of health literacy in this regard, and increasing risk factors for cervical cancer. In addition, considering that there has been no study carried out on cervical cancer literacy and its contributing factors in Yazd, Iran, the present study aimed to determine cervical cancer literacy in women referring to the health centers of Yazd province in 2018.

Materials and Methods

The present study was a cross-sectional study conducted on 800 women referring to the health centers of Yazd, the capital of Yazd province located in the center of Iran, in 2018.

For the calculation of the sample size, the mean value of health literacy as 97.9±12.7 (17) with a confidence interval of 95%, error of 0.9%, and loss factor of 5% was obtained.

$$N = \frac{\left(z_{1-\frac{\alpha}{2}}\right)^2 \times \sigma^2}{\varepsilon^2} = 800$$

Sampling was carried out using a stratified random method; accordingly, all 64 health centers of Yazd were considered the strata and included in the study, and then sampling was performed considering the proportion of the population in each health center. Due to a lack of sampling frame for the referred patients, systematic random sampling was conducted as every woman with an even appointment number was selected and invited to the study.

The inclusion criteria of the present study were the Iranian women of the reproductive age and middle-aged women (age range: 20-59 years) referring to the health centers of Yazd. Literacy (i.e., reading and writing), completion of the questionnaire, and no history of cancer were also other inclusion criteria of the current study.

In the present study, a researcher-made questionnaire developed by Bazaz et al. was used to collect data (17). The questionnaire consisted of two parts, namely demographic characteristics and health literacy items. The first part contained demographic information such as age, educational level, employment status, socioeconomic status, marriage duration, fertility date, family history of cancer, use of media (e.g., time spent on watching television), internet search, and counseling.

The second part of the questionnaire evaluated cervical cancer literacy according to various aspects of health literacy with 27 items based on a 5-point Likert scale, including always, often, sometimes, rarely, and never. The items included 5 questions of accessibility skill (score range: 5-25), 4 questions of reading skill (score range: 4-20), 5 questions of understanding skill (score range: 5-25), 5 questions of assessment skill (score range: 5-25), and 8 questions of decision-making skill and information use (score range: 8-40). In addition, total scores of health literacy ranged from 27 to 135. The content validity ratio (CVR=1) and reliability (α=0.706) of the questionnaire were confirmed in a study carried out by Bazaz et al. (17). After the calculation of the participants' scores of the questionnaire, the subjects were categorized into three groups of limited (scores of less than 99), average (scores of between 99 and 106), and adequate (scores of higher than 107) literacy (17).

After obtaining necessary permissions from Yazd Shahid Sadoughi University of Medical Sciences and Provincial health centers, 64 comprehensive health centers of Yazd were referred. Then, sampling was carried out in coordination with the head of each center in order to collect data. The objectives of the study were clearly explained to the participants, and they were assured of the confidentiality of their information and agreed to participate in the study. The questionnaires were completed by the participants through the self-administered method within 3 months in 2018.

The collected data were coded and entered into the SPSS software (version 20; SPSS Inc., Chicago, Illinois, USA) after completing the questionnaires. Descriptive statistics (i.e., frequency, percentage, mean, and standard deviation) were used to describe the data. Data normality was analyzed using the Kolmogorov-Smirnov test. Analysis of variance was used to examine the correlation of educational level, employment status, income level, health insurance status, and fruit and vegetable consumption with health literacy scores and its subscales (i.e., accessibility, reading, understanding, appraising, and decision-making skills).

Pearson's correlation coefficient was used to assess the effects of age and body mass index on the scores. In addition, Spearman's correlation coefficient was utilized to examine the correlation of frequency of a Pap smear, number of associated reading hours, and number of hours spent on watching television. The independent samples t-test was applied to evaluate the impact of a history of genital warts and cancers on the participants or their first-degree relatives and searching content on the internet. The t-test was utilized to compare health literacy scores based on using the internet, talking to mothers and friends, reading associated materials, and time spent on watching television. Moreover, multivariate analysis of variance was used to compare the scores of health literacy subscales based on the five above-mentioned factors. A p-value of 0.05 was considered statistically significant.

Results

The present study was carried out on 802 women with a mean age of 35.85±7.99 years and within the age range of 20-59 years. In terms of educational level, 42.3% of the participants had academic degrees, and 46.6% of the subjects had a high school diploma and under diploma degrees. In addition, the rest of the study participants were illiterate or low-literate. Moreover, 28.9% (n=231) and 71.1% (n=567) of the participants were employees and housewives, respectively. In this study, 76.6% (n=600) of the study subjects had low or no income. Furthermore, 71.3% (n=547), 23.2% (n=154), and 7.2% (n=157) of the subjects were reported without basic insurance, without supplementary insurance, and with no insurance, respectively.

The participants' average age of marriage was 20.5 years, and the average marriage duration was 14.99 years.

Table 1. Relationship between mean scores of health literacy and demographic characteristics of participants

	Health literacy			Accessibility skill	Reading skill	Understanding skill	Assessment skill	Decision-making skill
	N (%)	Mean±SD	P-value	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD
Employment status								
Employed	567 (71.1)	58.36±17.13	0<0.001	11.91±4.1	13.96±3.16	10.59±2.8	12.15±2.9	16.64±5.46
Unemployed	231 (28.9)	64.4±13.96		13.91±4.21 0<0.001	13.4±2.97 0<0.001	11.49±3.44 0<0.001	13.05±4.54 0<0.001	16.94±6.63 0<0.001
Educational level								
Under Diploma	210 (26.18)	66.16±14.57		17.2±3.47	12.59±3.18	12.47±4.03	13.5±4.55	16.26±6.7
Diploma	251 (31.4)	91.33± 16.55	0.009	21.9±4.21	13.3±3.11	21.6±3.8	17.9±4.4	25.8±6.5
College	339 (42.3)	78.50±10.2		11.63±3.57 0<0.001	14.4±2.95 0.04	19.5±2.93 0.09	14.6±3.6 0.052	16.4±5.5 0.01
Income level								
Low	155 (19.5)	71.36±16.97		14.49±4.77	12.88±3.27	11.55±4.09	14.39±4.4	18.03±6.55
Sufficient	477 (60.2)	67.28± 15.18	0<0.001	13.42±3.98	13.36±3.01	11.25±3.47	12.6±4.24	16.14±6.28
Good	161 (20.7)	64.83±14.49		12.22±4.33 0<0.001	13.74±2.59 0.03	12.93±2.95 0.04	11.72±4.21 0<0.001	16.2±6 0<0.019
Insurance status								
No	157 (19.57)	70.18±18.36		13.6±4.3	12.75±3.5	10.54±4.22	12.64±5.81	18.03±3.55
Basic	574 (76.3)	68.39±15.61	0<0.001	12.38±4.13	13.44±2.96	11.28±3.51	13±4.35	16.14±6.28
Supplementary	154 (23.2)	65.11±15.21		13.76±3.88 0<0.001	13.08±3.08 0<0.001	11.14±3.6 0<0.001	12.11±3.98 0.041	16.2±6 0<0.001
Fruit and vegetable consumption								
Low	314 (40.1)	70.56±16		12.48±4.33	13.2±3.17	10.52±3.69	13.41±4.54	11.5±3.69
Good	410 (52.3)	66.35±15.41	0<0.001	12.78±4.13	13.3±2.92	11.23±3.47	12.6±4.21	11.23±3.47
Very good	60 (7.7)	60.71±12.68		13.82±3.48 0<0.001	12.75±3.75 0.059	11.95±3.28 0<0.001	10.95±3.8 0<0.001	9.95±3.28 0<0.001

Table 2. Relationship between use of information sources and mean scores of health literacy

				Dimensions of health literacy									
	Health literacy			Accessibility		Reading		Understanding		Appraising		Decision-making	
	N (%)	Mean±SD	P-value&	Mean±SD	*P-value	Mean±SD	*P-value	Mean±SD	P-*value	Mean±SD	*P-value	Mean±SD	*P-value
Web searching													
Yes	527 (66.1)	58.46±14.62	<0.0001	12.28±3.69	<0.0001	8.59±3.08	<0.0001	9.99±3.42	<0.0001	11.87±3.86	<0.0001	16.12±5.71	<0.0001
No	270 (33.9)	70.90±18.06		15.98±4.15		10.29±3.69		11.77±4.05		14.70±4.64		18.55±6.95	
Mothers' counseling													
Yes	214 (27.1)	57.02±14.80	<0.0001	11.86±3.90	<0.0001	8.97±3.38	<0.0001	10.03±3.55	0.215	11.80±3.91	0.002	15.40±5.50	<0.0001
No	576 (71.9)	64.59±17.16		14.08±4.18		9.24±3.40		10.82±3.78		13.22±4.45		17.53±6.42	
Friends' counseling													
Yes	361 (45.2)	53.38±14.71	<0.0001	12.34±3.89	<0.0001	8.94±3.31	<0.0001	9.87±3.38	0.088	12.01±3.78	<0.0001	15.67±5.17	<0.0001
No	437 (54.8)	66.17±17.80		14.46±4.27		9.39±3.49		11.21±3.91		13.52±4.68		17.98±6.88	
Reading time													
<1 h	227 (51.5)	62.57±17.37	0.032	13.53±4.29	0.001	9.00±3.42	0.210	10.45±3.86	0.960	12.98±4.52	0.014	17.26±6.38	0.249
≥1 h	214 (48.5)	58.95±17.40		11.97±3.60		8.56±3.22		10.29±3.45		11.67±3.86		16.21±5.59	
Television time													
<1 h	206 (44.8)	62.43±17.36	0.007	13.18±4.18	0.378	8.79±3.28	0.846	10.34±3.95	0.300	12.81±4.50	0.780	17.04±6.09	0.457
≥1 h	254 (55.2)	61.93±16.37		13.06±3.97		9.40±3.44		10.73±3.69		12.40±4.02		16.86±4.46	

P-value of independent t-test; *P-value of multivariate analysis of variance; Significant level (P<0.05)
SD: Standard deviation

In addition, 50.24% of the participants did not undergo a Pap smear; however, the rest of the women underwent a Pap smear once. Moreover, 98% of the participants undergoing a Pap smear were reported with normal results, and only 2% of them had abnormal results.

The mean scores of health literacy also did not show any significant relationship with the number of Pap smears (P=0.078).

The mean score of women's overall health literacy was reported as 69.46±15.59. Furthermore, the mean values of overall health literacy subscales of accessibility, reading, understanding, appraising, and decision-making skills were 13.34±4.25, 14.59±3.06, 11.44±3.56, 12.72±13, and 16.84±6.19, respectively. In the present study, 97.9% (n=783), 1.1% (n=9), and 1% (n=8) of the participants had limited, average, and adequate health literacy, respectively.

According to Table 1, the obtained results revealed that there were statistically significant relationships between the level of health literacy and its dimensions with demographic information, such as employment status, educational level, income level, and insurance status.

The findings of the present study also demonstrated that there was no significant relationship between health literacy and history of genital warts in mothers. The mean scores of health literacy were 56.83±10.38 and 69.6±15.73 for the subjects with a history of cervical cancer and other cancers in first-degree relatives, respectively. In this regard, there was no statistically significant relationship with health literacy (P=0.398 and P=0.935). The present study assessed the relationship between the use of information sources and mean values of health literacy. The analytical t-test showed significant differences between health literacy with web searching and mother's and friend's counseling (P≤0.001; Table 2)

Discussion

The obtained results of the present study showed that over 90% of the participants had limited health literacy. This finding is consistent with the results of a great number of studies in Iran, such as studies by Ghanbari et al. (2017), Mahdavi et al. (2017), Bazaz et al. (2019), Reisi et al. (2012), Rezaee et al. (2016), Izadirad and

Zareban (2015), and Tehrani (2016) (14, 15, 17-22), in addition to foreign studies by Morris et al. (2013), Assoumou et al. (2015), Lee et al. (2012), Sentell et al. (2015), and Jovic et al. (2017) (10, 23-26). In a study carried out by Izadirad et al. (2015), 68% of the individuals had inadequate and borderline health literacy, and only 32% of the subjects had adequate health literacy.

Individuals with low levels of health literacy used less prevention and screening services, and as the results indicated more than half of women had never undergone a Pap smear. It could delay cancer diagnosis; therefore, postcancer diagnosis would be at a more developed stage. Over the past decades, concerns about health literacy skills have been alarms in many domains of health (18). In a study conducted by Saatchi et al. (2017), the participants' mean score of health literacy was 58.06. In addition, 35%, 18.21%, 12.29%, and 7.14% of the participants in the aforementioned study had partially insufficient, sufficient, insufficient, and excellent health literacy, respectively. These results are consistent with the findings of the present study (27).

A study carried out by Ghanbari et al. (2017) aimed to determine the level of health literacy and its relationship with cancer screening behaviors among the administrative staff of Guilan University of Medical Sciences, Guilan, Iran. The obtained results of the aforementioned study are inconsistent with the findings of the present study, indicating that 57% (n=106) and 43% (n=80) of the participants had good and moderate levels of health literacy, respectively (14). The discrepancy was probably due to the target group, including the staff of University of Medical Sciences.

In the present study, there was a significant relationship between the individual's health literacy regarding cervical cancer and their educational levels; accordingly, the women with a high school diploma or under diploma degrees obtained higher scores at different subscales of health literacy (i.e., reading, accessibility, understanding, appraising, and decision-making) than other educational groups, such as illiterate, low-literate, and even academic groups. It was probably due to their exposure to other media, such as television. In general, the

illiterate participants also obtained the lowest level of health literacy, as presented in other studies (27, 28). In a study performed by Jalilian et al. (2013), significant relationships were also observed between demographic variables (e.g., educational levels and individual knowledge) and performance of a Pap smear (29).

The results of the present study indicated that there was a significant relationship between the women's mean scores of health literacy and their employment status as housewives had higher health literacy that might be due to more opportunity for reading or searching for health information and sufficient opportunity to visit health centers and acquire information. These findings are inconsistent with the results of some studies in this regard, such as a study by Naghibi et al. (2017) in which statistically significant relationships were observed between all the aspects of health literacy and occupation (28). In another study carried out by Mahdavi et al. (2017), health literacy score of employed women was reported as 54.2 which was almost twice the score of housewives (15) .

In the present study, the variables, such as supplementary insurance, reading time, mothers' and friends' counseling, and frequency of Pap smears were significantly related to reading skills. This result is inconsistent with the findings of a study conducted by Safari et al. (2017) on educational level and health literacy (30). Therefore, a high level of health literacy and awareness in people with higher educational levels reflects the role of education in this domain because general literacy is a basis for health literacy.

Reading skills improve as the educational level increases. Education is considered an important factor in health literacy. Therefore, the health system should be available for individuals with low levels of health literacy through training by simple pictures and cultural examples via the media, communicating with simple language, and developing guidelines in order to minimize various factors affecting health literacy, including education, and increase the individuals' understanding of health information.

The results of a study carried out by Asgharnia et al. (2010) also confirmed that increasing knowledge about the importance of a Pap smear reduced barriers as the insufficient knowledge of a Pap smear was a major obstacle to screening; accordingly, providing information, leaflets, and clear explanations to patients about a Pap smear could reduce their embarrassment and stress. Therefore, the higher level of knowledge of the target group in society increases their positive attitudes and provides more satisfactory results in this regard (31).

The results of the independent t-test indicated a significant relationship between the mean scores of health literacy and all its subscales with the ability to search the internet. It seems that one of the common ways to gain knowledge is the ability to search. The findings of the present demonstrated that the mean score of assessment skill was 12.72 out of 25, indicating that 32.3% (n=259) of the participants rarely checked the information in terms of reliability and accuracy. In addition, only 12% of the study subjects could always appraise the accuracy of obtained information from the internet.

In the current study, more than 40% of the women had a diploma and lower levels of education. It seems that watching television and using other information sources make participants knowledgeable. It can be concluded that there are no main and valid internet sources to use by participants that could enhance their health literacy. In another study conducted by Ghanbari et al. (2017), the appraising subscale, which judged the accuracy of health information in study subjects, received the least score. It might be due to the individuals' weakness in judgment or lack of confidence in their information (22).

Ahmadi et al. in their study (2018) showed that the lowest score among dimensions in individuals with desirable health literacy was related to the appraising dimension (46.5); however, the highest percentage belonged to the appraising dimension in a group with a lower level of health literacy (53.3) (32). The mean score of decision-making skill was very low in the present study. The scores were within the range of 8-40, and women were reported with a mean score of 16.84±6.19. Furthermore, a majority (60-68%) of the subjects could not easily implement the provided information in daily life or did not know where to refer if they

had cervical cancer or they could not go for a Pap smear. This issue is also observed in studies conducted by some Iranian and foreign researchers, and they cannot make good decisions due to low levels of health knowledge or literacy (17, 28).

Ezzati et al. (2017) observed that increasing women's knowledge could raise the possibility of undergoing a Pap smear. Knowledge is an important factor in the success of disease prevention programs; accordingly, an important step can be taken toward decision-making and changing individuals' behaviors by identifying participants with causes of the disease, its transmission pathways, at-risk groups, and early diagnosis of the disease. According to the findings of the present study, the attention to raising knowledge should be the first step in behavior-changing interventions to form new behaviors, improve decision-making skills and healthy behaviors, and alter wrong behaviors (33).

The current study had a few limitations. The first limitation was the self-reporting design of the questionnaire. The second limitation was the study population of the study, including only the female participants referring to health centers, and being at the middle age.

Conclusion

The results of the present study showed that level of cervical cancer health literacy was low in women referring to the health centers of Yazd. Therefore, there was a pressing need for the health education of this group. Many women receive health information from physicians, health staff, television, and radio; consequently, the emphasis on proper medical education, accuracy and continuation of mass media programs to increase prevention knowledge of cancer, and introduction of cancer screening tests for the target group through effective workshops and health promotion programs can meet women's needs in society, improve cancer screening, and be an effective step toward the enhancement of individuals' health literacy.

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Conflicts of interest

Authors declared no conflicts of interest.

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