

Effect of women's health literacy levels on their beliefs about breast cancer screening

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Received: 2022-11-01

Accepted: 2022-12-07



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J Clin Med Kaz 2022; 19(6):89-95

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Abstract

Objective: This study was conducted to examine the effect of women's health literacy level on breast cancer screening beliefs.

Material and methods: This study has been done descriptively. In data collection, measurement tools such as 'Descriptive Information Form', 'Health Literacy Scale' and 'Breast Cancer Screening Beliefs Scale' developed based on literature and observations were used. Statistical analysis of the data was made in SPSS 20.0 statistical package program. Before the study was conducted, approval was obtained from XXX Faculty of Nursing Ethical Council.

Results: When the descriptive-variable characteristics of the women participating in the study were examined, it was determined that the difference between health literacy levels and breast cancer screening beliefs was significant ($p < 0.05$).

Conclusion: As a result of the research, it was determined that as the health literacy level of women increased, the level of breast cancer screening beliefs also increased.

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

Introduction

Health services are needed for mental and bodily health, which is the common desire of whole humanity. Hence, everyone is a health service user. In this regard, they should know about their health as well as the health services they will use. Health literacy (HL) has an important place in individuals' access to and use of health services [1]. The WHO defines health literacy as the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions [2]. Although HL is of particular concern for all people, it affects women more because women's health could have positive or negative consequences on both their own health and the health of their families. Healthy women create healthy families, healthy families create healthy societies, and healthy societies create environments with high health and wealth levels. Many factors affect the HL level, which include population structure, cultural features, psychosocial factors, literacy level, individual characteristics, disease-related experiences, and financial resources of the country [3].

In their large-scale study entitled "Health literacy in Europe: comparative results of the European HL survey" and conducted in 2011, Sorensen et al. (2012) included eight European countries and found that the prevalence of insufficient HL was 47% [4]. In their society-based study entitled "Turkish HL Investigation", Tanrıöver et al. (2014) reported the insufficient HL as 64.6% (inadequate HL prevalence: 24.5%, problematic HL prevalence: 40.1%), and around two out of three people were reported to have insufficient HL level [5].

Inadequate/low HL level is reported to cause individuals to experience inadequacies in accessing, obtaining, understanding, and interpreting health-related information; have difficulties in understanding health-related problems and inadequacies in implementing treatments when they have problems about health; experience difficulties in performing medical procedures and instructions; have increases in the rates of applications to hospitals and hospitalizations; and demonstrate insufficient protection behaviors [6].

Together with the inadequacies in the use of protective health services, low HL causes restrictions

in screenings that have vital importance in the early diagnosis of diseases like cancer [7]. In other words, low/inadequate HL increases the use of health services for treatment purposes rather than protective health services. The use of health services for treatment purposes causes individuals to go to the hospital only when they have a disease, increases hospitalization rates, and decreases compliance with the treatment and satisfaction with health services [8]. Compared with women with marginal and adequate literacy, women with low literacy were significantly more likely to have negative attitudes about mammography including that a mammogram would be embarrassing, harmful, or painful, and were also more likely to feel that it would be a lot of trouble to get a mammogram [9]. Given the increase in its prevalence, early diagnosis and screening programs for breast cancers have vital importance in society [10]. Screening methods with proven effects are used for the early diagnosis of breast cancer; BSE (Breast Self-exam), CBE (Clinical Breast Exam) and mammography are among the screening methods used [11]. Diagnosing this public health problem early via breast cancer screening and minimizing the mortality rate could be possible by increasing the health knowledge and HL level. Recent studies have investigated the association of health literacy with cancer-related attitudes, knowledge, and behaviors to educate and increase patient trust, self-efficacy, and engagement in decision making. [9,12].

Women, who affect the majority of society as mothers and wives, should be helped to increase their knowledge and awareness about HL and provided with trainings on this issue, which is believed to contribute to positive developments in the HL level of the family, society, and country. As knowledge also brings belief, health knowledge level that increases women's HL also increases belief levels about being healthy. To what extent women, whose HL level is determined, believe, and attach importance to breast cancer and breast cancer screening could also be investigated.

Material and methods

Aim and type of the study

This descriptive study aims to determine women's health literacy level and its effects on their beliefs about breast cancer screening.

Population and sample of the study

The number of individuals to be included in the sample was determined using priori power analysis, and Cohen's standard effect sizes were taken as reference in the power analysis performed [13]. The minimum sample size to represent the population was calculated as 385 at 95% confidence interval. Considering potential data loss, extra 10% of sample was added to this number, and the study was completed with 400 women.

Place and time of the study

Data were collected between the 1st of May and the 30th of June 2021. The study included women who lived in Van province, who were at least literate, who were aged below 65, who did not have a psychiatric problem, who did not have a hearing problem, who could communicate sufficiently, and who agreed to participate in the study.

Data collection tools

Data were collected through the "Personal Information Form", the "Health Literacy Scale" and the "Breast Cancer Screening Beliefs Questionnaire".

The Personal Information Form: The form was prepared by the researchers in line with the literature and included questions to collect data about women's socio-demographic characteristics, characteristics of spouses in married women, characteristics about reading books, and knowledge about breast cancer and breast cancer screenings.

The Health Literacy Scale: The scale was developed by Suka et al. (2013) in Japan in 2010 to measure adults' HL levels [14]. Turkish adaptation and reliability and validity of the scale were performed by Türkoğlu and Kılıç in 2021 [15]. The scale has three sub-scales including Functional HL (5 items), Interactive HL (5 items), and Critical HL (4 items). Cronbach's alpha value of the original scale was found 0.81. This study found Cronbach's alpha value as 0.94, and Cronbach's alpha values of the sub-scales ranged between 0.86 and 0.92.

Breast Cancer Screening Beliefs Questionnaire: The scale was developed by Kwok et al. (2010) in 2010 to determine women's breast cancer screening beliefs [16]. Turkish adaptation, reliability, and validity of the scale were performed by Türkoğlu and Sis Çelik in 2021 [17]. The scale has three sub-scales including Attitudes towards General Health Checkups, Knowledge and Perceptions about Breast Cancer, and Perceived Barriers to Mammographic Screening. Cronbach's alpha internal coefficients were found to range between 0.76 and 0.87 in the sub-scales of the original scale. The scores to be obtained from the scale range between 0 and 100. Mean scores of 65 and over in the sub-scales indicate that screening beliefs increase positively, knowledge level increases, and barriers to mammography screening decrease. This study found Cronbach's alpha value as 0.77.

Data Collection: Data were collected between the 1st of May and the 30th of June 2021 from women who agreed to participate in the study after their verbal consent was received. The online questionnaires prepared in Google forms and the scale questions were sent to the participants through WhatsApp on their phones, and data were collected through the snowball sampling method.

Data Analysis: Data were analyzed in SPSS 20.0 statistical package program. Analyses included t-test in independent groups, one-way analysis of variance (ANOVA), Kruskal Wallis test, and Mann Whitney-U test. Descriptive values included numbers and percentages in categorical data and arithmetic means and standard deviation values in quantitative data. The statistical significance level was accepted $p < 0.05$.

Ethical considerations

Before the study was conducted, approval was obtained from XXX Faculty of Nursing Ethical Council on April 5, 2021 (Approval no. 2021-1/9). Participants of the study were informed that their personal information would not be disclosed to any person other than the researcher, and that no one else would be able to access the information.

Results

Of all the participating women, 53.75% were aged 18 to 30, 57.75% had an education level of university and above, 53.75% were married, 80.75% had a nuclear family, 57.25% worked, 57.5% had a medium economic level, and 76.25% did not have a chronic disease. Besides, 81% read books, 64.5% liked reading written materials, and 81.75% defined their general health condition as good. It was also found that 57.1% of the spouses of married women were aged between 20 and 40 and 68.2% had an education level of university and above. Of all the participating women, 69.5% received information about breast

Table 1

Sociodemographic of Women, Reading and Distribution of Characteristics of Health Conditions

	S	%	HL Total	Breast Cancer Screening Beliefs Total
Age				
18-30	215	53.7	47.18±3.92	71.94±15.28 a
31-40	98	24.5	46.92±3.77	69.38±15.89 a
41-50	48	12	47.83±3.73	66.46±15.91 ab
51 and above	39	9.7	47.64±2.82	62.32±21.08 b
Statistical Analysis			F:0.798 p:0.496	F:4.742 p:0.003
Level of Education				
Literate	21	5.25	46.81±4.85	37.82±8.41 d
Primary School Graduate	19	4.75	47.63±2.58	59.31±12.66 c
Secondary School Graduate	42	10.5	46.81±2.68	62.72±13.43 bc
High School Graduate	87	21.75	46.43±2.92	68.87±12.19 ab
University or Higher Graduate	231	57.75	47.63±4.13	75.06±14.79 a
Statistical Analysis			F:1.915 p:0.107	F:42.400 p:0.001
Marital Status				
Married	215	53.75	47.20±3.67	70.17±17.91
Single	185	46.25	47.29±3.88	69.18±14.41
Statistical Analysis			t:0.065 p:0.799	t:0.363 p:0.547
Family structure				
Core	323	80.75	47.43±3.88	71.65±15.30 a
Wide	56	5.25	46.25±3.28	60.37±18.15 b
Parents Separated	21		47.00±2.81	64.83±18.43 b
Statistical Analysis			F:2.389 p:0.093	F:13.071 p:0.001
Working Status				
Working	229	57.25	47.57±4.01	74.03±14.64
Not Working	17	42.75	46.80±3.36	63.94±16.82
Statistical Analysis			t:4.080 p:0.044	t:40.868 p:0.001
Economic Situation				
Good	156	39	47.22±3.58 a	74.93±14.09 a
Middle	230	57.5	47.36±3.72 a	66.98±16.24 b
Bad	14	3.5	45.43±5.93 b	56.59±23.89 c
Statistical Analysis			F:1.743 p:0.176	F:16.876 p:0.001
Chronic Disease				
Yes	95	23.75	47.08±3.14	65.14±19.38
No	305	76.25	47.29±3.94	71.14±15.07
Statistical Analysis			t:0.212 p:0.645	t:9.961 p:0.002
Reading Status				
Yes	324	81	47.33±3.82	73.40±14.39
No	76	19	46.86±3.50	53.99±15.01
Statistical Analysis			t:0.977 p:0.323	t:110.145 p:0.001
How She Evaluates Her General Health Status				
Very good	55	13.75	48.05±3.10	85.06±11.40 a
Good	327	81.75	47.14±3.87	68.14±15.10 b
Bad	18	4.5	46.50±3.46	51.49±18.56 c
Statistical Analysis			F:1.744 p:0.176	F:44.929 p:0.001

a, b, c... : The difference between groups that received different letters for each feature was statistically significant ($p < 0.05$).

cancer and early diagnosis of breast cancer, 94.75% did not have anyone with breast cancer in their family or close relatives, 78.85% had heard about BSE (Breast Self-exam) before, 62% knew how to do BSE, and 50.5% did BSE regularly. It was found that 69.6% of women heard about CBE (Clinical Breast Exam) before, 85.2% heard about mammography before, 95.5% did not have mammography before, and 92.25% did not have mammary ultrasonography before.

The difference in the HL scale total mean score was found to be statistically significant according to women's working or not ($p < 0.05$) (Table 1). Mean scores were found to be higher in women who worked and who liked reading a lot.

The difference between the breast cancer screening total score was found to be significant according to the characteristics such as women's age, education level, family structure, working or not, economic level, chronic disease, reading books, enjoying reading written materials, and perceived general health condition ($p < 0.05$) (Table 1). Mean scores were found to be higher in

women who were aged 18 to 30, who had an education level of university and above, who had a nuclear family structure, who worked, who had a good economic condition, who did not have a chronic disease, who read books, who liked reading a lot, and who defined their health as very good.

The difference in the HL scale total score was statistically significant according to women's having heard about BSE, CBE and mammography before and having had mammary ultrasonography before ($p < 0.05$) (Table 2). The mean scores were found to be higher in women who heard about BSE, CBE, and mammography before and who had mammary ultrasonography before.

The difference in the breast cancer screening questionnaire total score was found to be significant according to the age and education level of spouses ($p < 0.05$) (Table 2). Total mean scores were higher in women whose spouses were aged between 20 and 40 and whose spouses had an education level of university and above.

Table 2

Woman's Spouse and Pregnancy Status, Information Distribution on Breast Cancer and Early Diagnosis in Breast Cancer

	S	%	HL Total	Breast Cancer Screening Beliefs Total
Husband's Age				
20-40	122	57.1	46.86±3.96	72.96±17.45 a
41-60	76	35.5	47.58±3.23	67.51±17.46 ab
61 and above	16	7.4	47.94±3.45	61.53±20.43 b
Statistical Analysis			F:1.241 p:0.291	F:4.290 p:0.015
Spouse's Education Level				
Primary School Graduate	7	3.2	49.00±6.72	46.15±16.89
Secondary School Graduate	11	5.1	47.73±3.90	43.88±14.53
High School Graduate	51	23.5	47.53±2.73	62.78±16.30
University or Higher Graduate	148	68.2	46.99±3.80	75.76±15.17
Statistical Analysis			F:0.644 p:0.632	F:19.834 p:0.001
Do you know about breast cancer and its early detection?				
Yes	278	69.5	47.45±3.33	73.42±14.21
No	122	30.5	46.77±4.58	61.27±17.84
Statistical Analysis			t:2.735 p:0.099	t:52.810 p:0.001
Having a family or close relative with breast cancer				
Yes	23	5.25	48.23±2.63	76.73±18.99
No	377	94.75	47.18±3.82	69.30±16.16
Statistical Analysis			t:1.600 p:0.207	t:4.214 p:0.041
The state of hearing BSE before				
Yes	315	78.75	47.53±3.43	71.84±14.72
No	85	21.25	46.16±4.68	61.85±19.60
Statistical Analysis			t:8.959 p:0.003	t:26.492 p:0.001
The state of knowing how BSE is done				
Yes	248	62	47.50±3.34	74.34±14.40
No	152	38	46.82±4.35	62.15±16.62
Statistical Analysis			t:3.122 p:0.078	t:60.015 p:0.001
Condition of performing BSE regularly				
Yes	202	50.5	47.59±3.39	75.31±14.62
No	198	49.5	46.88±4.09	64.01±16.13
Statistical Analysis			t:3.523 p:0.061	t:53.908 p:0.001
The state of hearing CBE before				
Yes	278	69.6	47.59±3.26	73.04±14.71
No	122	30.5	46.44±4.64	62.15±17.48
Statistical Analysis			t:7.993 p:0.005	t:41.270 p:0.001
Having heard of mammography before				
Yes	343	85.2	47.55±3.59	71.05±15.20
No	57	14.8	45.39±4.25	61.70±20.58
Statistical Analysis			t:16.716 p:0.001	t:16.538 p:0.001
Have you had a mammogram before?				
Yes	18	4.5	48.58±3.74	72.17±16.13
No	382	95.5	47.17±3.76	69.61±16.39
Statistical Analysis			t:2.527 p:0.113	t:0.397 p:0.529
Having had a breast ultrasound				
Yes	31	7.75	48.67±3.63	74.18±15.98
No	369	92.25	47.11±3.75	69.31±16.37
Statistical Analysis			t:5.207 p:0.023	t:2.682 p:0.102

a, b, c... : The difference between groups that received different letters for each feature was statistically significant (p<0.05).

Table 3

The Health Literacy Scale and Breast Cancer Screening Beliefs Questionnaire Mean Scores

	Scale	Number of items	Min-max	X±SS
HL Scale	Functional HL sub-scale	5	5-25	19.81±4.36
	Interactive HL sub-scale	5	5-25	20.44±3.43
	Critical HL sub-scale	4	6-20	16.61±2.28
	Total	14	20-70	56.87±9.09
Breast Cancer Screening Beliefs Questionnaire	Health Screening sub-scale	4	0-100	53.03±23.12
	Knowledge and Perceptions of Breast Cancer sub-scale	4	0-100	77.37±18.52
	Barriers to Mammography Screenings	5	0-100	76.95±17.52
	Total	13	0-100	69.72±16.37

Table 4

Correlation of Scale Score Means (n=400)

		1	2
(1) HL Scale	r	-	0.708
	p	-	0.001
(2) Breast Cancer Screening Beliefs Questionnaire	r	0.708	-
	p	0.001	-

The difference between breast cancer screening beliefs questionnaire total score was found to be significant according to women's receiving information about breast cancer and early diagnosis of breast cancer, having someone with breast cancer in the family and close relatives, having heard about BSE before, knowing how to do it, and doing it regularly and having heard about CBE and mammography before ($p < 0.05$) (Table 2). Mean scores were found to be higher in women who received information before, who had someone with breast cancer in the family or close relatives, who heard about BSE before, knew how to do it, and did it regularly, and who heard about CBE and mammography before.

Women were found to receive 19.81 ± 4.36 in the functional HL sub-scale, 20.44 ± 3.43 in the interactive HL sub-scale, 16.61 ± 2.28 in the critical HL sub-scale, and 56.87 ± 9.90 in the total HL mean score.

Mean scores were found 53.03 ± 23.12 for the attitudes towards health screening sub-scale, 77.37 ± 18.52 for the knowledge and perceptions of breast cancer sub-scale, 76.95 ± 17.52 for the mammography sub-scale, and 69.72 ± 16.37 for the total breast cancer screening belief questionnaire (Table 3).

A positive, statistically significant, and medium-level relationship was detected between women's HL scale and breast cancer screening beliefs questionnaire mean scores ($p < 0.05$). Women's breast cancer beliefs increase with the increase in their HL level (Table 4).

Discussion

This study found that younger women had higher breast cancer screening beliefs. It was reported that 79% of women who had just been diagnosed with breast cancer and 88% of women who died of breast cancer were aged 50 and above [18]. A study conducted with women in America defined breast cancer risks of women according to age as follows: risk until the age of 39: 0.49% (1 in 203 women), risk between the ages of 40 and 59: 3.76% (1 in 27 women), risk between the ages of 60 and 69: 3.53% (1 in 28 women), and risk at the age of 70 and above: 6.58% (1 in 15 women) [12]. Percentages in these studies indicate that risk of having breast cancer and mortality rates associated with this increase demonstrates an increase with age. Hence, screening behaviors are expected to increase with the increase in the risk with aging; the lack of this increase is considered to be associated with the decrease in the HL level with aging.

This study found that women's breast cancer screening beliefs increased with the increase in their education level. Çidem and Ersin (2019) found that women's screening behaviors increased with the increase in the education level [19]. The study conducted by Duman et al. (2015) also found that regular BSE practice increased with the increase in the education level. This finding of the study is in line with the literature [20].

Women who had a nuclear family structure were found to have higher breast cancer screening beliefs compared to other groups. Pulgaron et al. (2016) reported that grandparents affected children's and grandchildren's receiving health services and increased the implementation of traditional health methods [21]. When this finding is considered, it seems that the presence of grandparents or mother or father-in-law is a barrier to benefiting

from health services and distracts women from protective behaviors. Women in extended families have decreased beliefs about breast cancer screening, which is a protective behavior.

This study found that working women and women with good income levels had higher breast cancer screening beliefs. Regarding working and economic conditions, a study in the literature reported that individuals' support from social networks decreased the negative consequences of low knowledge levels [22]. This result suggests that the individual is within the family and social network, and understanding and using health information generally depends on others' knowledge and skills [23]. These studies indicate that working women are more conscious because their economic level is good and their social network is greater. Besides, higher breast cancer screening beliefs of working women and women with a good financial condition are considered to be associated with their easier access to health services and trainings.

This study found that women who did not have a chronic disease and whose perceived general health was good had higher breast cancer screening beliefs. A study conducted with individuals living in Japan reported that some patients with chronic diseases had low HL and knowledge scores [24]. Individuals with low HL were found to be less healthy, could cope with chronic diseases less, had less knowledge about health, and had difficulties in reading and understanding the information written in medicine leaflets or hospital forms [25]. The reason for lower HL levels in women with chronic diseases is considered to be associated with the increase in age-related chronic diseases and again age-related decrease in screening beliefs.

This study found that women who read books had higher breast cancer screening beliefs. Dişçigil et al. (2007) found that the rates of breast cancer screening behaviors increased directly proportionally with the education level [26]. This finding is considered to be associated with the increase in HL levels with the increase in reading and writing activities, which are considered to affect breast cancer knowledge levels and increase the belief levels.

The difference in the breast cancer screening questionnaire total score was found to be significant according to spouses' age and education level, and the women whose spouses were aged 20 to 40 and had an education level of university and above had higher breast cancer screening beliefs. Education and HL levels of people surrounding individuals affect their level of knowledge [27]. Family members with higher abilities could help other family members to perform health-related duties and have an independent contribution to the manageability of the health-related duties better [28]. The reason for the increase in women's health knowledge level due to their spouse's education level is considered to be associated with the increase in women's belief levels with the exchange of knowledge and beliefs about screenings in the family.

HL levels were found to be higher in women who heard about BSE, CBE, and mammography before and who had mammary ultrasonography before. Besides, breast cancer screening beliefs were found to be higher in women who received information about breast cancer and early diagnosis, who had someone with breast cancer in the family or close relatives, who heard about BSE before and knew how to do it, and who did it regularly, and who heard about CBE and mammography before. BSE, CBE, and mammography are highly important for the early diagnosis of breast cancer. Yılmazel (2013) found that performing BSE increased with the increase in women's education level [29]. Altuncan et al. (2008) reported an association between education level and performing BSE [30]. Considering the studies

conducted, screening behaviors used for the early diagnosis of breast cancer are directly proportional to literacy and education level. Women's awareness increased with the increase in their education level. Although women knew about breast cancer and early diagnosis of breast cancer, screening rates were found to be inadequate and low, indicating a lack of awareness about the importance of screenings.

A study conducted with women showed that the presence of a positive family history affected screening behaviors in women [31]. In this study, women's knowing someone with breast cancer seems to make them strive for learning more about health. With the information they gained, an increase was reported in their use of screening methods and belief levels, which is somewhat expected. A study on the experience and satisfaction of women who participated in breast cancer screenings showed that women generally reported high satisfaction with their screening experiences; their worries were eliminated; breast cancer screenings had relatively fewer effects on the social and physical aspects of their life but enabled positive effects on some emotional issues such as assurance, well-being, and relief [32]. Increase in screening beliefs with the increase in knowledge, conscious and education about early diagnosis of breast cancer is somewhat expected in women who had information about breast cancer screening behaviors and who had screenings.

Women, who form around half of society, are important parts of the family who have roles as mothers, wives, sisters, and daughters. The woman's age, education level, health-related beliefs, and access to health services are factors that affect their health [33]. HL level is one of the most important factors that affect women's health protection and improvement behaviors. This study found participating women's HL scale total mean score as 56.87±9.90, indicating an above-average HL level. Studies conducted worldwide indicate that HL is below expected levels [34,35]. A study conducted in the USA reported that 22% of adults' reading and writing skills remained at a basic level. The HL level determined with the TSOY-32 scale in our country indicated the HL levels as inadequate for 30.9%, problematic-insufficient for 38%, sufficient for 23.4%, and perfect for 7.7%; the study reported that 7 out of 10 people in our country had inadequate or insufficient HL level [36]. The same study reported that the prevalence of inadequate/low HL was 26.4% in males and 35.3% in females, indicating lower HL levels in women [5].

These findings of the related studies indicate that the HL level was higher in this study, which is considered to be caused by the different sample groups.

Women's breast cancer screening belief questionnaire mean score was found 69.72±16.37 in this study. Breast cancer is a serious health problem that affects women all over the world. Although it has a high mortality rate, death rates are reported to decrease with early diagnosis and treatment [37]. Low/inadequate HL is an important barrier to the early diagnosis and screening of breast cancer [38].

This study found that the difference between the HL scale and breast cancer screening beliefs scale was positive, medium-level, and statistically significant. Women's breast cancer screening beliefs increased with the increase in their HL level. In the study conducted with women aged 20 and over, Erbil and Bölükbaş (2012) found that self-efficacy and health motivation scores increased significantly with the increase in the education level [39]. This study indicated that the HL level increased with the increase in the education level, and demand and health-protecting and improving behaviors increased with the increase in HL.

Conclusion

Women's socio-demographic and breast health-related characteristics were found to affect their breast cancer screening behaviors. Besides, breast cancer screening beliefs increased with the increase in women's HL levels. Increased HL levels in women also increased the demand for screening methods that are important for early diagnosis of breast cancer, which is common in women; the increase in beliefs in screening is somewhat expected since cancer treatment is more effective with early diagnosis. It is believed that HL should be improved particularly in women with lower HL levels.

Disclosures: There is no conflict of interest for all authors.

Acknowledgements: None.

Funding: None.

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