J Canc Educ (2018) 33:89–94
DOI 10.1007/s13187-016-1053-y

Health Literacy, Mammogram Awareness and Screening Among Tertiary Hospital Women Patients

Gulay Yılmazel[1]

Published online: 28 May 2016

Abstract In spite of high mortality rates and prevalence, breast cancer awareness and screening is low among Turkish women. This study aimed to determine level of health literacy, mammogram awareness, and screening among tertiary hospital women patients. A cross-sectional study was conducted with 519 patients aged between 40 and 69. A questionnaire was applied to women patients including demographic characteristics, health behaviors, mammogram awareness and screening, and health literacy tool. Mammogram awareness and screening were questioned according to the Turkish Breast Cancer Screening Standard. To assess health literacy level, the Rapid Estimate of Adult Literacy in Medicine was used. Over half of the women were aware of the mammogram age and 23.1 % had a mammogram within 2 years. Limited health literacy was high among patients, and it was significantly associated with lower mammogram awareness (OR 6.53; 95% CL 1.46–9.13) and screening (OR 1.12; 95% CL 0.45–2.80). Health literacy can be an advantageous opportunity on focal point of national cancer screening. Breast cancer education program and public health campaigns should be arranged according to women health literacy level.

Keywords Health literacy · Mammography · Awareness · Cancer screening · Women

✉ Gulay Yılmazel
dryilmazelgul@gmail.com

[1] Public Health Department, Hitit University School of Health, Çorum, Turkey

Introduction

Breast cancer is the most common cancer among women and that continues to stay at the top because of the 1.67 million new cases and 508.000 deaths worldwide [1]. In Turkey, it ranks first among cancers with high mortality rates (13.4 %) and 5-year prevalence (34 %) [1]. In 2013, it was reported that one of every four Turkish women had been diagnosed with breast cancer. Of these women, 45 % were between the ages of 50 and 69 and 40 % of were between 25 and 49 years [2]. Mammogram awareness and screening are fundamental for women to adopt and practice early detection of breast cancer [3], but low awareness and wrong beliefs can be a barrier. Health literacy is a dynamic part of individual capacities and has a shared definition used by different organizations as follows: skills of obtaining, processing, and understanding of basic health information to make appropriate health decisions [4, 5]. Health literacy is considered to be an important component in predicting women's behaviors including knowledge, awareness, and willingness for cancer screening [6–8]. Indeed, low health literacy (LHL) remains a main hidden obstacle to increase cancer awareness and screening due to having limited health vocabulary [9]. However, most studies suggest that breast cancer awareness and screening were low in Turkish women [10, 11], but there is no evidence that health literacy may improve mammogram awareness and screening.

The purpose of this study was to assess the level of health literacy, mammogram awareness, and screening among tertiary hospital women patients.

Methods

A cross-sectional study was conducted from August 2015 to February 2016 in out-patient clinics of a tertiary hospital which was located in Çorum city, Middle Black Sea region of Turkey. Target population was women patients aged between 40 and 69. Patients were recruited from different women health clinics. In the course of registration to admission system, patients were screened carefully by ten trained female nursery students. The city is growing rapidly by immigration day by day so all patients were chosen with Turkish- speaking. Criteria for exclusion were incompleted survey, being in other age groups, being illiterate, having psychiatric, hearing and vision problems. Patients were asked to participate in a 10-min private face to face interview. Before interview, verbal and written study consent was taken in an interview room. Patients were told that we were studying what patients knew about breast cancer screening age and if ever they had a mammogram. As part of the study, we also told them to answer a list of medical reading test. Relevant and volunteer 519 women were included in the study. The record of enrolling was sequentially according to the waiting list at the clinics. A questionnaire form was prepared by the researcher according to literature. To try out the validity of questionnaire, a pilot study was based on 30 patients. Data obtained by the questionnaire included four parts: demographic characteristics (age, education, marital status, occupation, monthly income, self-perceived health) and health behaviors (smoking, using alcohol, physical activity, regular health screening), mammogram awareness and screening and health literacy tool.

Mammogram Awareness and Screening

The National Turkish Breast Cancer Screening Standard (NBCS) suggests that "mammogram screening should start at age 40 and women who are 40–69 years should be screened biennial" [12]. By respect to the national guide, for the purpose of mammogram awareness, patients were asked to "Should mammogram screening start at age 40"? The content validity of this question was assessed by experts on oncology.

In order to identify mammogram screening, the patients were asked with questions "Have you ever had a mammogram?" and, if they answered "yes", "Have you had a mammogram within 2 years"?

Health Literacy Tool

To assess the health literacy level of patients, a health literacy tool was used, called as "The Rapid Estimate of Adult Literacy in Medicine (REALM)". The REALM is defined as a robust test to measure health information (Cronbach $\alpha = 0.99$) [13]. It asks participants to read a list of 66 medical terms. Level of health literacy varies according to scores which obtains by reading and pronunciation terms correctly. For each correct score, patients are given "1" point. Categories of health literacy are divided into three groups according to the total scores. Patients with a REALM score of 61–66 were classified as adequate health literacy while other with scores ranging from 0 to 44 and 45 to 60 were classified as inadequate and marginal health literacy, respectively [13]. The tool was translated into Turkish version by Ozdemir et al. [14]. Also in this study, the internal consistency of the REALM was found as good (Cronbach $\alpha = 0.96$).

Table 1 Characteristics and health literacy level of patients

Characteristics ($n = 519$)	Number	Percent
Age group (mean: 50.6 + 8.4 years)		
40–49 years	286	55.1
50–59 years	124	23.9
60–69 years	109	21.0
Education level		
Less than high school	359	69.2
High school	117	22.5
University	43	8.3
Marital status		
Married	489	94.2
Not-married	30	5.8
Occupation		
Housewife	416	80.2
Employee	103	19.8
Household income (monthly)		
≥1000 $	170	32.8
500–999 $	304	58.6
0–499 $	45	8.6
Self-perception of health		
Good	271	52.2
Average	234	45.1
Poor	14	2.7
Regular health screening in last year		
Always	359	69.2
Never	160	30.8
Smoking status		
Current	112	21.6
Nonsmoker	407	78.4
Alcohol using		
Current	37	7.1
Never	482	92.9
Physical activity		
Regular	72	13.9
Non-regular/never	447	86.1
Familial breast cancer history	20	3.9
Mammogram awareness	303	58.4
Mammogram screening		
Ever had a mammogram	120	23.1
Had a mammogram within the 2 years	120	23.1
Health literacy level		
Adequate (REALM score above 60)	31	6.0
Marginal (REALM score 45–60)	256	49.3
Inadequate (REALM score 0–44)	232	44.7

Statistical Analysis

Data was analyzed by using the SPSS Program 17.0. In analysis, means, standard deviation, chi-square test, and multivariable logistic regression analysis were used. In analyses,

Table 2 Patient characteristics by health literacy level

Characteristics	Adequate ($n = 31$)	Marginal ($n = 256$)	Inadequate ($n = 232$)	p value
Age (years)	*No.(%)*	*No.(%)*	*No.(%)*	0.037
40-49	12 (38.7)	157 (61.3)	117 (50.4)	
50-59	10 (32.2)	56 (21.9)	58 (25.0)	
60-69	9 (29.1)	43 (16.8)	57 (24.6)	
Education				0.000
<High school	2 (6.5)	157 (61.3)	200 (86.2)	
High school	13 (41.9)	75 (29.3)	29 (12.5)	
University	16 (51.6)	24 (9.4)	3 (1.3)	
Occupation				0.000
Housewife	9 (29.0)	198 (77.3)	209 (90.1)	
Employed	22 (71.0)	58 (22.7)	23 (29.9)	
Monthly income				0.000
≥1000 $	21 (67.7)	75 (29.3)	74 (31.9)	
500-999 $	8 (25.8)	162 (63.3)	134 (57.8)	
0-499 $	2 (6.5)	19 (7.4)	24 (10.3)	
Self-perception of health				0.005
Good	22 (67.7)	148 (57.8)	101 (43.5)	
Average	9 (25.8)	102 (39.8)	123 (53.0)	
Poor	0 (6.5)	6 (2.4)	8 (3.5)	
Smoking status				0.004
Current	14 (45.2)	54 (21.1)	44 (19.0)	
Nonsmoker	17 (54.8)	202 (78.9)	188 (81.0)	
Had a regular health screening in last year				0.000
Never	6 (19.4)	100 (39.1)	54 (23.2)	
Mammogram awareness				0.000
Not aware of screening age	2 (6.5)	100 (39.1)	114 (49.1)	
Ever had a mammogram screening				0.000
Never	21 (67.7)	156 (60.9)	181 (78.0)	

health literacy level was handled in two categories as "adequate" and "limited" (inadequate and marginal), $p < 0.05$ values were considered statistically significant.

Ethical Approval

The study protocol was conducted in accordance with the Helsinki Principles and approved by the Ethics Committee of Hitit University.

Results

The sample of study was consisted of 519 women patients. Table 1 shows characteristics and health literacy level of respondents. The average age was 50.6 ±8.4 years. Of the study population, 55.1 % were between the age of 40 and 49 years, 69.2 % had less education than high school, 94.2 % were married, and 80.2 % were housewives. In response to the question: "Should mammogram screening start at age 40?", 58.4 % of the patients reported "yes". Only a small number of patients indicated that they had a mammogram before (23.1 %), and also all of those had a mammogram within the 2 years. Inadequate literacy and marginal health literacy were present in 44.7 % and in 49.3 % of patients, respectively. Adequate health literacy existed in 6 % of patients.

The distribution of patient characteristics by health literacy level is shown in Table 2. Adequate health literacy was significantly higher in 40–49 years than compared with other age groups. Among patients, who had a university degree, employed individuals and individuals with high income and good self-perceived health adequate health literacy were found significantly more often. On the other hand, inadequate health literacy was significantly more frequent among housewives who are less educated and nonsmokers. Health care, mammogram awareness and screening also affected health literacy. Inadequate health literacy was consistently associated with mammogram awareness and screening.

Table 3 lists the factors associated with mammogram awareness and screening. Limited health literacy was significantly associated with lower mammogram awareness (OR 6.53; 95% CL 1.46–9.13) and screening (OR 1.12; 95% CL 0.45–2.80). The effects of other factors on mammogram awareness were not significant. Nonetheless, lower mammogram screening risk was 5.55 times higher in patients with poor self-reported health and 4.57 times higher with having low income.

Table 3 Logistic regression results to predict mammogram awareness and screening

Variable	Mammogram awareness		Mammogram screening	
	OR	95% CL	OR	95% CL
Limited health literacy	6.53*	1.46–9.13	1.12*	0.45–2.80
Age				
40–49 years	Reference		Reference	
50–59 years	0.89	0.57–1.40	1.02	0.61–1.71
60–69 years	0.92	0.58–1.47	1.51	0.86–2.67
Education				
Less than high school	2.88	1.07–7.74	1.53	0.61–3.83
High school	1.74	0.64–4.77	1.22	0.49–3.01
University	Reference		Reference	
Occupation				
Housewife	0.94	0.53–1.66	0.84	0.44–1.61
Employed	Reference		Reference	
Income				
≥ 1000$	Reference		Reference	
500–999$	1.10	0.70–1.72	2.06*	1.24–3.43
0–499$	1.43	0.67–3.02	4.57*	1.61–13.08
Self-perceived of health				
Good	Reference		Reference	
Average	1.12	0.78–1.68	0.77*	0.47–1.27
Poor	1.44	0.46–4.53	0.18*	0.05–0.60
Smoking status				
Current	1.08	0.68–1.74	0.73	0.44–1.61
Nonsmoker	Reference		Reference	
Never had a regular health screening in last year	0.85	0.57–1.26	1.11	0.69–1.79

*p values < 0.05

Discussion

In spite of the increase in breast cancer, mammogram screening rates were low among women in our country. Studies from different Turkish cities reported that mammogram screening rates were between 22.3 and 54 % [10, 11, 15]. In contrast to Turkey, a report by the Centers for Disease Prevention and Control (CDC) indicated that 66.8 % of women aged 40 or younger had had a mammogram within the past 2 years [16]. Also, studies from different countries reported a wide range of mammogram screening as 43–78 % [17–21]. In the present study, over half of the women were aware of the mammogram screening age, but surprisingly, mammogram screening was very low. These results seem to be consistent with national studies but lower than the international reports.

This study showed that majority of women patients (94 %) had REALM scores in the category of limited (marginal or inadequate) health literacy level. Prior studies showed similar findings that women patients had limited level of health literacy [22, 23]. A possible explanation for this might be that women were exposed to sexism in the field of education and occupation and health.

As mentioned in the several reports, the current study also confirmed significant association between health literacy level and socio-demographic features [22, 24, 25]. Adequate health literacy existed among younger, employed, high educated, patients with high income and good self-perception of health. Aging which leads to decline in functions is an inconvertible factor. Because of less formal education, individuals may have poor income and health. So, national intervention schemes should be made on formal education which establishes a social dignity in favor of women.

Investigating the obstacles for mammogram awareness and screening can be a pioneer to develop effective national interventions. This study identified a supportive evidence to these obstacles that health vliteracy levels were a determining factor on mammogram awareness and screening. Notably, lower mammogram awareness significantly associated with limited health literacy and this evidence has not previously been described. However, mammogram screening significantly associated with limited health literacy, lower income, and poor

self-perceived health (Table 3). These results are consistent with those observed in earlier studies [7, 8, 23]. The next steps should involve public health framework to increase health literacy, breast cancer awareness, and screening. Public health workers can assume this valuable mission. In primary care, family health centers may be arranged as a meeting place and education environment because of intensive women population. Educations should be designed on health practice and national screening policy of breast cancer by researching women's basic literacy and communication skills.

As a conclusion, this study provides noteworthy information by exploring impacts of health literacy level on mammogram awareness and screening in a sample of Turkish women. Limited health literacy was widespread among women and also mammogram awareness, and screening were associated with limited health literacy. Health literacy can be an advantageous opportunity on focal point of national cancer screening. Breast cancer education program and public health campaigns should be arranged according to women health literacy level.

The rapid estimate of adult literacy in medicine (REALM)

Please, read aloud words as you can, beginning with the first word on List 1. When you come to a word you cannot read "blank," and then go on to the next word on the list.

List 1	List 2	List 3
Fat	Fatigue	Allergic
Flue	Pelvic	Menstrual
Pill	Jaundice	Testicle
Dose	Infection	Colitis
Eye	Exercise	Emergency
Stress	Behavior	Medication
Smear	Prescription	Occupation
Nerves	Notify	Sexually
Germs	Gallbladder	Alcoholism
Meals	Calories	Irritation
Disease	Depression	Constipation
Cancer	Miscarriage	Gonorrhea
Caffeine	Pregnancy	Inflammatory
Attack	Arthritis	Diabetes
Kidney	Nutrition	Hepatitis
Hormones	Menopause	Antibiotics
Herpes	Appendix	Diagnosis
Seizure	Abnormal	Potassium
Bowel	Syphilis	Anemia
Asthma	Hemorrhoids	Obesity
Rectal	Nausea	Osteoporosis
Incest	Directed	Impetigo
Correctly pronounced word (+):	Correctly pronounced word (+):	Correctly pronounced word (+):
RAW SCORE:		

RAW SCORE	READING LEVEL
0–18	*Third grade and below*: Patient won't be able to read most low literacy materials. She will need repeated oral instructions or written materials composed of primarily of illustrations
19–44	*Fourth to sixth grade*: Patient will need low literacy materials and may not be able to read prescription labels.
45–60	*Seventh to eighth grade*: Patient will have trouble reading most patient education materials. Use low literacy materials.
61–66	*High school*: Patient will be able to read most patient education materials.

Many thanks for participating in our study.

References

1. World Health Organization. International Agency for Research on Cancer. Globocan 2012: Estimated cancer incidence mortality and prevalence worldwide in 2012. http://globocan.iarc.fr/Default.aspx
2. T.C. Sağlık Bakanlığı. Türkiye Halk Sağlığı Kurumu. Türkiye Kanser İstatistikleri, Ankara, 2016. http://kanser.gov.tr/Dosya/ca_istatistik/ANA_rapor_ 2013v01_ 2.pdf
3. World Health Organization. Breast cancer: prevention and control. http://www.who.int/cancer/detection/breastcancer/en/index1.html
4. U.S. Department of Health and Human Services. Healthy people 2010: understanding and improving health. http://www.healthypeople.gov/2010
5. Nielsen-Bohlman L, Panzer MA, Kindig DA (2004) Health literacy: a prescription to end confusion. Institute of Medicine The National Academies Press, Washington, pp 20–65
6. Guerra CE, Krumholz M, Shea JA (2005) Literacy and knowledge, attitudes and behavior about mammography in Latinas. J Health Care Poor Underserved 16(1):152–166
7. Sentell TL, Tsoh JY, Davis T, Braun KL (2015) Low health literacy and cancer screening among Chinese Americans in California: a cross-sectional analysis. BMJ Open 5:e006104
8. Sentell T, Braun KL, Dvis J, Davis T (2015) Health literacy and breast and cervical cancer screening guidelines among Asians and Whites in California. Springerplus 4:432
9. Davis TC, Williams MV, Marin E, Parker RM, Glass J (2002) Health literacy and cancer communication. CA Cancer J Clin 52(3):134–149
10. Açıkgöz A, Çehreli R, Ellidokuz H (2015) Determination of knowledge and behavior of women working at a hospital on breast cancer early detection methods, and investigation of efficiency of planned education. J Breast Health 11:31–38
11. Ozaydın AN, Gulluoğlu BM, Unalan PC, Gorpe S, Cabioglu N, Oner BR, Ozmen V (2009) Breast cancer knowledge, source of information, and breast health practices of women in Bahçeşehir. J Breast Health 5:214–224
12. T.C. Sağlık Bakanlığı. Türkiye Halk Sağlığı Kurumu. Kanser Daire Başkanlığı. Kanser Taramaları. http://kanser.gov.tr/kanser/kanser-taramalari/878-meme-kanseri-ve-mamaografi. ttml
13. Davis TC, Long S, Jackson R, Mayeaux EJ, George RB, Murphy PW et al (1993) Rapid estimate of adult literacy in medicine: a shortened screening instrument. Fam Med 25:391–395
14. Ozdemir H, Alper Z, Uncu Y, Bilgel N (2010) Health literacy among adults: a study from Turkey. Health Educ Res 25(3):464–477
15. Demir Yıldırım A, Özaydın AN (2014) Sources of breast cancer knowledge of women living in Moda/İstanbul and their attendance to breast cancer screening. J Breast Health 10:47–56
16. Centers For Disease Control and Prevention (CDC).Health United States, 2014. http://www.cdc.gov/nchs/data/hus/hus14.pdf#076
17. Sadler GR, Ko CM, Cohn JA, White M, Weldon R, Wu P (2007) Breast cancer knowledge, attitudes, and screening behaviors among African American women: the Black cosmetologists promoting health program. BMC Public Health 7:57
18. Ryu E, Ahn O, Baek SS, Jeon MS, Han SE, Park YR, Ham MY (2008) Predictors of mammography uptake in Korean women aged 40 years and over. J Adv Nurs 64:168–175
19. Azubuike S, Okwuokei S (2013) Knowledge, attitude and practices of women towards breast cancer in Benin city, Nigeria. Ann Med Health Sci Res 3:155–160
20. Pivot X, Eisinger F, Blay JY, Coscas Y, Calazel-Benque A, Viguier J, Roussel C, Morère JF (2011) Mammography utilization in women aged 40–49 years: the French EDIFICE survey. Eur J Cancer Prev 20:S16–S19
21. Ryerson AB, Miller JW, Eheman CR, Leadbetter S, White MC (2008) Recent trends in U.S. mammography use from 2000–2006: a population-based analysis. Prev Med 47:477–482
22. Jovic-Vranes A, Bjegovic-Mikanovic V (2012) Which women patients have better health literacy in Serbia? Patient Educ Couns 89(1):209–212
23. Pagan JA, Brown CJ, Asch DA, Armstrong K, Bastida E, Guerra C (2012) Health literacy and breast cancer screening among Mexican American Women in South Texas. J Cancer Educ 27:132–137
24. Ginde AA, Weiner SG, Pallin DJ, Camargo CA Jr (2008) Multicenter study of limited health literacy in emergency department patients. Acad Emerg Med 15(6):577–580
25. von Wagner C, Knight K, Steptoe A, Wardle J (2007) Functional health literacy and health-promoting behaviour in a national sample of British adults. J Epidemiol Community Health 61(12):1086–1090