

# Comparing the Frequency and Barriers in Performing Mammography in Different Occupations in 2018

Sh. Najjar<sup>1</sup>, P. Afshari<sup>2</sup>, M. Iravani<sup>1</sup>, MH. Haghighi Zadeh<sup>3</sup>, Kh. Heivari<sup>4</sup>

<sup>1</sup>Reproductive Health Promotion Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran, <sup>2</sup>Menopause Andropause Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran, <sup>3</sup>Department of Statistic, School of Public Health, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran, <sup>4</sup>Department of Midwifery, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

## Abstract

**Introduction:** Screening for early detection of breast cancer has been proven useful with mammography as one of the most important one of these methods. Mammography screening in women is essential, but it is evidently not being done in a timely manner among many Iranian women. Given the limited studies done in relation to the health of employed women, the present study was done to compare the frequency of doing mammography screening and the barriers in different occupations. **Methods:** This descriptive-analytic study was done on 895 married women aged 40–60, who were selected using convenience sampling, working in health care, educational, administrative, service, and homemaker groups in Shush, Andimeshk, and Dezful, in selected centers. Data were collected using a researcher-made questionnaire of screening barriers, demographic information, and a checklist for data screening and analyzed in SPSS 21. **Results:** Most of the samples in all five groups had not performed mammography screening. Doing regular mammography was 14.5% for health care group, 8.4% for educational group, 7.3% for administrative group, 5% for homemaker group, and 4.5% for services group. The results of ANOVA test of the individual barriers scores showed that the barriers related to lack of awareness, economic/social barriers, and the barriers related to providers in the groups were statistically significant. **Conclusion:** The screening rate is low in employed women that can be due to various individual and structural barriers, so doing educational interventions at different levels are suggested to remove barriers and increase the level of their performance.

**Key words:** Breast cancer, employed women, mammography, occupational groups screening

## INTRODUCTION

Breast cancer is the most common cancer worldwide<sup>[1]</sup> and 32% of all cancers in women and 18% of causes of death due to cancer in women are due to breast malignancies.<sup>[2,3]</sup> Breast cancer is the most common type of cancer among Iranian women.<sup>[4]</sup> The incidence of breast cancer in Iran is 22 cases/100,000 persons; its prevalence is 120 cases/100,000 persons and the deaths associated with it are 1200 cases per year.<sup>[5,6]</sup> Breast cancer causes death in 60%–70% of people with no known risk factors.<sup>[7]</sup> Cancer screening and its timely diagnosis are of the most effective ways to reduce mortality and reduce costs.<sup>[8]</sup> Studies show that death from breast cancer is reduced by 40% through screening.<sup>[9]</sup> Most women with breast cancer survive due to early diagnosis and use of effective therapies.<sup>[10]</sup> The proper method of

timely diagnosis is knowledge of early signs and symptoms, breast self-examination, screening, periodic examinations by physicians, midwives, and mammography.<sup>[11]</sup> One of the best ways of screening breast cancer is mammography. Of the important benefits of mammography is the early diagnosis of breast cancer before reaching a diameter of 5 mm. A standard mammography can detect lesions 2–4 years before they can be touched.<sup>[12,13]</sup> The use of mammography in women under 50 with timely diagnosis and treatment of breast cancer has led to a survival rate of 5 years to be more than 90%.<sup>[14]</sup>

Although this method is effective, few women welcome

### Address for correspondence:

Kh. Heivari, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran. E-mail: Heivari@yahoo.com

**Received:** 01-05-2018

**Revised:** 30-05-2018

**Accepted:** 10-06-2018

mammography.<sup>[15]</sup> The rate of mammography in Ardabil is reported from 3.7%<sup>[16]</sup> to 36%,<sup>[17]</sup> in Sanandaj about 7%,<sup>[18]</sup> among female specialists of seven Iranian medical universities about 27%,<sup>[19]</sup> among teachers in Tehran, 14%,<sup>[20]</sup> and among women of 20–65 years of age in Kazeroun 18%.<sup>[21]</sup> Various factors affect the overall screening and mammography specifically.<sup>[22,23]</sup> Some factors are facilitators and some barriers to screening.<sup>[24,25]</sup> Among the barriers to mammography introduced in Iranian studies is the lack of systematic screening programs for early detection of breast cancer and access to the mammography facilities.<sup>[26]</sup> Thomas *et al.* found that lack of awareness of the risk of breast cancer, refraining from preventive medical advice, denial of the severity of the disease, and lack of active role in screening are seen in most Iranian women.<sup>[27]</sup> The study by Akhtari-Zavare (2014) on breast self-examination showed the inadequate awareness of women of this examination, with only 26% of women doing it.<sup>[28]</sup> According to a study by Ghazdehi *et al.*, among the main barriers to screening for women admitted to Tehran health centers (2012) were not having signs of breast cancer, no concern over cancer, lack of attention to health status, and belief in destiny.<sup>[29]</sup> According to a study by Mokhtari *et al.* in Tabriz on health-care personnel, the greatest barriers to screening were the pain of mammography and the fear of malignancy diagnosis.<sup>[26]</sup> According to a study by Naghibi *et al.* (2016) concerning the identification of factors related to breast cancer screening conducted on teachers in Kermanshah, the most important reasons for not screening are negligence, forgetfulness being too busy, and lack of time, fear, and concern.<sup>[30]</sup> It seems that women being employed can be effective in screening or not performing it. Today, the presence of women in social and occupational environments is inevitable.<sup>[31]</sup> Women make up one-third of the world's labor, which is higher in developing countries, about 55%, and in the rest of the world is less than one-third.<sup>[32]</sup> The participation of women as labor in Iran was 9.1% according to the statistics of 1996, whereas the recent Iranian census shows that women's share of the official workforce is 11% and currently stands at 2.1 million women working in the country.<sup>[33]</sup> Women have various roles in life,<sup>[34]</sup> and with 8 h of daily work are more at risk of health disorder, and working in various environments can lead to occupational injury and illness.<sup>[35]</sup> Moreover, the workplace is a good environment for training and shaping behaviors.<sup>[36]</sup> Ahmadnia (2006) showed that the expectations and pressures caused by the multiple roles played by employed women would render them worse off in terms of health compared to women who only play traditional roles.<sup>[37]</sup>

Given the importance of breast cancer screening, the effective role of mammography in early diagnosis of the disease, and that limited studies have been done on the health of working women, as well as the importance of community health and the role of midwife as a provider of services to women, we decided to conduct a study entitled “Comparison of frequencies and barriers for the screening of mammography in different occupations of Shush, Dezful, and Andimeshk

in 2018” to improve women's health. By determining the frequency of screening for breast cancer and identifying barriers to doing it in different occupations, one can take a valuable step toward removing barriers to screening the health of women working in the community.

## METHODS

This is a descriptive-analytic study. First, the researcher specified the barriers to mammography screening in women, designed a questionnaire, and then determined the barriers of screening mammography among the various groups of women. The sample was married women aged 40–60 with no history of breast cancer, non-pregnant, non-lactating homemakers, nurses and midwives, employees, teachers, and workers in the cities of Shush, Dezful, and Andimeshk. The research place was determined by simple randomized quotas from among public and private hospitals and health centers, girls' schools, public and private offices, gathering places for working women, such as shops and restaurants, and health centers to access homemakers in Dezful and Andimeshk. In Shush, all research environments were used by the census. The sampling method used was convenient sampling. The sample size was calculated based on a similar paper,<sup>[38]</sup> with a 5% error rate and a test power of 84% for each group of 179 people, totaling 895.

Data collection tools were demographic researcher-made questionnaire, mammography screening checklist, and mammography screening barriers questionnaire. Mammography screening questionnaire was designed using interviews and related texts. Participants at this stage of the study were 10 people. The interviews were semi-structured with open questions about the reasons for not performing Pap smear and mammography screening. After interviewing ten participants, the researcher reached data saturation through the interview, and the sampling was completed. The place of individual interviews was the workplace of the selected individuals. Moreover, widespread searches were done at various sites, articles, and books with keyword “screening, mammography, Pap-smear, and barriers.” Using interview results and data from the texts, a questionnaire was designed to determine the barriers to screening for Pap smear and mammography. The resulting questionnaire had 21 items at Likert scale (from totally agree = 1 to totally disagree = 5) that examines the barriers in four dimensions: individual (7 questions), awareness (7 questions), socioeconomic (3 questions), and related to providers (4 questions). For making the dimensions comparable, scores were converted into percentages. The lower score indicates the more importance of barriers. Cronbach's alpha of the questionnaire with test-retest method with a 2-week interval was 0.77.

After designing and approval of the questionnaire, the sampling in the target community began. For women

working, the questionnaires were given to them by referring to their workplace and considering the criteria for inclusion and exclusion. Concerning the homemakers, the questionnaires were distributed among them in their visiting of health centers and at their homes. Moreover, some explanations were given on how to complete the questionnaire. In the case of those who were less literate or could not complete the questionnaire alone, the researcher completed the questionnaire by interview and collected the information. The subjects and the checklist by the researcher completed the demographic questionnaire. The checklist was related to whether screening was performed or not. If the person did not do the mammography, she received the questionnaire on barriers to screening, and in the case of doing screening, only the demographic questionnaire and the checklist were completed. Data were analyzed using SPSS 22. For quantitative variables, one-way ANOVA was used and to compare the qualitative ordinal variables Kruskal-Wallis, and for qualitative nominal variables, Chi-square test.

The ethical considerations of this study were obtaining permission from relevant authorities and presenting a letter of introduction, introducing oneself to the subjects and obtaining written consent from them, assuring them about the confidentiality of all recorded personal information and providing the results of the research to the relevant authorities.

## RESULTS

The average age of the samples in the various occupational groups was from 44 to 47. The educational group had the least average age and the homemaker group had the highest. The average age of the sample's spouses was from 47 to 53. The lowest average age was related to the educational group and the highest average age was related to the homemaker group. Educational level of the most of the samples in the health care, educational, and administrative groups was bachelor's degree and most of the samples in services and homemakers had middle- and high-school degrees. Sample spouse's educational levels were mostly associate and bachelor's degree in the health care, educational, and administrative groups and in services and homemakers in most cases middle and high school. Approximately half of the samples in the health care, educational, and administrative group reported enough income, and the rest relatively adequate, but in the services and homemakers group, they often reported income relatively adequate. The average number of pregnancies and the number of children in the training group was lower and in the homemaker group more than the rest of the groups. The number of post-menopausal women is also lower in education and administrative groups and in the homemaker groups more. The duration of menopause was also lower in the health-care group and in the homemaker group [Table 1].

**Table 1:** Frequency distribution of demographic characteristics of the occupational groups

Variable	n=179					P
	Health care	Education	Administrative	Services	Homemaker	
Mean±SD						
Age (year)	45.88±3.81	44.23±3.83	45.21±3.55	45.56±4.28	47.87±5.67	<0.001
Spouse age (year)	48.75±3.69	47.56±3.92	48.66±3.50	49.26±4.53	52.51±6.37	<0.001
Education frequency (%)						
Illiterate	0	0	0	3 (1.7)	4 (2.2)	<0.001
Elementary/guidance	0	0	0	80 (44.7)	61 (34.2)	
High school	0	0	10 (5.6)	71 (39.7)	60 (33.5)	
Associate's	39 (21.8)	30 (16.8)	43 (24)	18 (10.1)	31 (17.3)	
Bachelor's	134 (74.9)	135 (74.4)	114 (63.7)	7 (3.8)	22 (12.3)	
Master's	6 (3.4)	14 (7.8)	12 (6.7)	0	1 (0.6)	
Income frequency (%)						
Enough	78 (43.5)	107 (59.8)	78 (45.2)	13 (7.3)	73 (40.8)	<0.001
Relatively enough	101 (56.4)	72 (40.2)	95 (53.1)	133 (74.3)	102 (57)	
Not enough	0	0	6 (3.6)	33 (18.4)	3 (1.7)	
Midwifery information, mean±SD						
The number of pregnancies	2.18±0.79	2.31±0.96	2.36±0.83	2.78±0.86	3.47±1.38	<0.001
The number of children	2.15±0.76	2.09±0.85	2.30±0.79	2.77±0.87	3.29±1.38	
Menopause	20±11.17	16±8.9	16±8.9	29±16.2	36±20.1	
Menopause duration	1.93±0.66	2.38±1.02	2.25±1.06	3.45±2.1	4.43±2.2	

SD: Standard deviation

Most of the samples had not done mammography in all five groups. The frequency of regular mammography from high to low was thus: health care (14.5), educational (8.4), administrative (7.3), homemakers (5), and service (4.5) [Table 2]. The lowest individual barriers were in the health-care group (49.86), administrative (45.16), services (44.07), educational (40.28), and homemakers (37.61). The results of ANOVA showed that the difference between groups was significant. Moreover, Tukey's *post hoc* test results showed that the average score of individual barriers was significant in pair-wise comparison of all groups (except for educational with homemaker and administrative with services). The lowest barriers related to lack of awareness were in the healthcare group (67.42), administrative (51.06), services (45.26), educational (43.54), and homemakers (39.91). The results of ANOVA showed that the difference between groups was significant. Moreover, the results of Tukey's *post hoc* test showed the average score of individual barriers was significant in pair-wise comparison of all groups (except for educational with services). The lowest socioeconomic barriers were in the health-care group (66.11), administrative (59.63), educational (56.11), homemaker (55.01), and services (53.17). The results of ANOVA showed that the difference between groups was significant. In addition, the results of Tukey's *post hoc* test showed the average score of individual barriers was significant in pair-wise comparison of all groups (except for educational with services). The lowest barriers were related to providers in the health care (44.58), administrative (39.73), educational (36.26), services (34.88), and homemakers (28.22). The results of ANOVA showed that the difference between groups was significant. Furthermore, the results of Tukey's *post hoc* test indicated that the average score of individual barriers was significant in pair-wise comparison of all groups (except for educational with services). In all occupational groups, individual factors were more contributing. The lowest barriers in the health

care group were the lack of knowledge; the least barriers in educational, administrative and homemaker groups were economic/social barriers, and the least barrier in the service group was for providers Service [Tables 3 and 4].

## DISCUSSION

The present study was conducted to compare the frequency of mammography screening and its barriers in various occupations on 895 women including administrative, health care, educational, services, and homemakers in 2017 in Shush, Dezful, and Andimeshk. Most of the samples in each of the five groups have not been screened for mammography. Mammography rates were the highest in health care and the least in the services group. In Enjezab *et al.* (2004), 80% of the subjects never referred to a specialist for a clinical examination of the breast, and only 3% did it on a regular basis.<sup>[39]</sup> In Bahrami *et al.*, only about 10% of women performed regular mammography, 5% had physician's regular examinations and 14% did breast self-examination regularly.<sup>[18]</sup> In Abedian-Kasgari *et al.*, about 70% of women had not gone for mammography.<sup>[40]</sup> In a study on gynecologists, Alavi *et al.* showed that only about 35% of the low-risk individuals and about 47% of the high-risk groups performed monthly breast self-examination and about 12% of the studied population and 13% of the high-risk groups had regular and annual mammography.<sup>[19]</sup> In Tavakolian *et al.* (2015), 35% of women had not had any screening for breast cancer and 82% had never referred for mammography.<sup>[21]</sup> Pormehr *et al.* reported the rate of mammography in women referring to health centers in Ardabil about 4%.<sup>[16]</sup> By studying Tehrani teachers, Khaleghnezhad and Khaleghnezhad showed that 60% of people over 40 had no history of mammography.<sup>[20]</sup> In a study on women working in the medical school of Khalkhal, Eyyvanbagha *et al.* (2015) showed that their knowledge,

**Table 2:** The frequency of mammography screening

Discipline	n=179					P
	Health care	Education	Administrative	Services	Homemaker	
Yes						
Regular	25 (14.5)	15 (8.4)	13 (7.3)	8 (4.5)	9 (5)	<0.001
Irregular	21 (11.7)	34 (34.19)	20 (11.2)	23 (912.8)	16 (8)	
No	129 (72.1)	130 (72.6)	145 (81)	149 (82.3)	153 (85.5)	

**Table 3:** Obstacles for screening mammography in different classes

Barriers in performing mammography	Mean±SD				
	Healthcare (n=144)	Education (n=165)	Administrative (n=165)	Services (n=171)	Homemaker (n=163)
Individual factors	49.86±10.01	40.28±12.98	45.16±9.94	44.07±11.19	37.61±9.03
Lack of knowledge	67.42±8.38	43.54±11.02	51.06±9.49	45.26±12.22	39.91±11.18
Economic/social/cultural	66.11±12.91	55.01±14.11	59.63±8.87	53.17±13.43	55.01±14.11
Related to providers	70.12±9.07	50.27±16.27	57.66±10.77	55.39±14.89	52.85±11.99

SD: Standard deviation

Table 4: Comparison of mammography screening barriers in different occupational groups

Comparison of mammography	Variance analysis		Education				Homemaker				Administrative				Services			
	F	P	Homemaker		Administrative		Health care		Services		Health care		Administrative		Services		Health care	
			P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
Total (individual factors)	29.09	<0.001	0.17	<0.001	<0.001	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.88	<0.001	<0.001	<0.001	
Total (lack of knowledge)	154.31	<0.001	0.01	<0.001	<0.001	0.57	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Total (economic/social/cultural)	62.99	<0.001	<0.001	0.009	0.68	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Total (related to providers)	10.14	<0.001	0.45	<0.001	0.004	<0.001	<0.001	0.02	0.44	<0.001	<0.001	0.57	<0.001	<0.001	<0.001	<0.001	<0.001	

attitude, and the performance of these women were relatively good.<sup>[41]</sup> Asgharnia *et al.* reported the rate of mammography in women admitted to the Al-Zahra hospital about 24%.<sup>[42]</sup> Allahverdiipour *et al.* reported performing at least one mammography screening, 29%.<sup>[43]</sup> The study of Mokhtari *et al.* on women working in Tabriz health centers showed that only 27% of these women performed mammography.<sup>[26]</sup> In a study in Turkey, Ozmen *et al.* showed that mammography screening was 49% in Istanbul and 35% Mus.<sup>[44]</sup> In a study in Malaysia, the rate of mammography screening in women over 40 was reported to be 14%.<sup>[45]</sup> In a study on Jordanian women, mammography rate was reported to be 21%.<sup>[46]</sup>

The lowest scores for individual barriers were in the health care, administrative, service, educational, and homemaker groups. Moreover, Tukey's *post hoc* test results showed that the average score of individual barriers was significant in pair-wise comparison of all groups (except for educational with homemaker and administrative with services). The lowest barriers related to lack of awareness were in the healthcare group, administrative, services, educational and homemakers. The results of ANOVA showed that the difference between groups was significant. Moreover, the results of Tukey's *post hoc* test showed the average score of individual barriers was significant in pair-wise comparison of all groups (except for educational with services). The lowest socioeconomic barriers were in the health-care group, administrative, educational, homemakers, and services. The results of ANOVA showed that the difference between groups was significant. In addition, the results of Tukey's *post hoc* test showed the average score of individual barriers was significant in pair-wise comparison of all groups (except for educational with services). The lowest barriers were related to providers in the health care, administrative, educational, services, and homemakers. The results of ANOVA showed that the difference between groups was significant. Furthermore, the results of Tukey's *post hoc* test indicated that the average score of individual barriers was significant in pair-wise comparison of all groups (except for educational with services). In Anjazab *et al.* (2004), the most common cause for doing screening methods was the recommendation of the health-care staff, the use of preventive methods, awareness through mass media, and the most common causes of non-referral to screening were the lack of awareness of such examinations, lack of awareness of the facilities for conducting these examinations, lack of history of the problem, fear of performing the examination, feeling embarrassed to undergo examination, and lack of training of health personnel for these examinations.<sup>[39]</sup> Bahrami *et al.* showed that employed women were performing more mammography screening.<sup>[18]</sup> In the study of Abedian-Kasgari *et al.*, the most common barrier to perform mammography was that breast self-examination was sufficient to find the mass in the breast. There were no significant differences between occupation and level of performance or screening barriers.<sup>[40]</sup> In Alavi *et al.*, the most common cause for not performing mammography screening was lack of attention

and negligence and lack of sufficient time. Moreover, the lack of willingness to be examined by colleagues and the lack of scientific belief in these screening methods were among the barriers to screening.<sup>[19]</sup> In Tavakolian *et al.* (2014), the most common reason for not referring to screening was being ashamed and embarrassment from the examinations. Among the factors, affecting access to screening, financial factors had the greatest impact and geographical factors had the least effect on the access of individuals to screen breast cancer.<sup>[21]</sup> In the study of Mokhtari *et al.*, the most common barriers to mammography and the clinical examination of the breast in women working in Tabriz health centers were painful mammography ( $2.45 \pm 1.02$ ) and fear of malignant tumors ( $2.30 \pm 1.05$ ). Doing mammography had a significant relationship with marital status and age ( $P < 0.001$ ). In addition, clinical breast examinations were significantly related to age ( $P = 0.02$ ). Although the participants attend health centers, they have false beliefs about performing mammography and clinical examinations of the breast and these beliefs may be associated with their low participation in screening programs. The development and implementation of educational programs and correcting the misconceptions of these women seem necessary.<sup>[26]</sup> Ghazdehi *et al.* stated not having breast cancer symptoms, no concern for breast cancer, no concern about breast cancer due to lack of familial history of the disease, belief in the lack of need for mammography, inattention to health condition, belief in destiny, and lack of mammography by friends and acquaintances among the barriers to screening for mammography.<sup>[29]</sup> Studying low-income African-American women with high rates of breast cancer deaths, Young *et al.* showed that clinical barriers such as patient education and communication, individual barriers such as distrust and awareness, and structural barriers such as lack of insurance, lack of facilities, and lack of providers are related to the lack of mammography screening.<sup>[47]</sup> In a study of Malaysian women, performing regular breast examinations and the potential for breast cancer were stated as the barriers to mammography.<sup>[45]</sup> In a study conducted on women with different occupations in Gorgan, Qorbani *et al.* (2009) showed that the nurses had the best status with 67.7% awareness and 78.6% performance and 68.9% of the teachers had the best attitude. Moreover, there was a significant difference between job and marital status with knowledge and job with performance and attitude.<sup>[38]</sup> Peipins *et al.* showed that geographic access to health facilities and mammography are of the factors affecting mammography in women living in Atlanta.<sup>[48]</sup> An extensive study in Washington showed that fear of issues, such as costs, mammography pain, bad news, and lack of insurance were the most common barriers to screening for mammography.<sup>[49]</sup> In a study in Sweden, emotional factors, lack of knowledge, lack of advice from health-care providers, and a very low confidence in health services were noted as barriers to perform mammography.<sup>[50]</sup> A study in Jordan showed that Jordanian women are aware of breast cancer, and social norms and self-efficacy have a significant effect on women's desire to perform mammography.<sup>[46]</sup>

Although no studies were found examining the extent of screening and its barriers in various occupational categories, in a few studies, each job has been studied separately and most studies have examined the extent of screening in the people admitted to health centers. However, overall, the results show that the level of screening for mammography is not optimal and various factors prevent performing it.

## CONCLUSION

The results of this study showed that using mammography screening in the studied society and in different occupations is much less than expected. Different individual, knowledge, structural, and socioeconomic barriers affect this screening method. As breast cancer screening is affected by many factors, by considering these barriers, one can present interventions to improve screening behaviors and reduce the risk of breast and cervical cancer in the form of in-service training for women working in different centers.

## ACKNOWLEDGMENT

This study is part of an MA dissertation approved by the Faculty of Nursing and Midwifery and the Ethics Committee of Ahvaz Jundishapur University of Medical Sciences (IR.AJUMS.REC.1396.492). Hereby, we would like to appreciate all the participants in the research and the authorities.

## REFERENCES

1. Karakoyun-Celik O, Gorken I, Sahin S, Orcin E, Alanyali H, Kinay M, *et al.* Depression and anxiety levels in woman under follow-up for breast cancer: Relationship to coping with cancer and quality of life. *Med Oncol* 2010;27:108-13.
2. Saslow D, Boetes C, Burke W, Harms S, Leach MO, Lehman CD, *et al.* American cancer society guidelines for breast screening with MRI as an adjunct to mammography. *CA Cancer J Clin* 2007;57:75-89.
3. Global Burden of Disease Cancer Collaboration, Fitzmaurice C, Dicker D, Pain A, Hamavid H, Moradi-Lakeh M, *et al.* The global burden of cancer 2013. *JAMA Oncol* 2015;1:505-27.
4. Amori N, Aghajani M, Asgarian FS, Jazayeri M. Epidemiology and trend of common cancers in iran (2004-2008). *Eur J Cancer Care (Engl)* 2017;26(5).
5. Nafissi N, Saghafinia M, Motamedi MH, Akbari ME. A survey of breast cancer knowledge and attitude in iranian women. *J Cancer Res Ther* 2012;8:46-9.
6. Kadivar M, Joolae S, Joolae A, Bahrani N, Hosseini N. Breast cancer knowledge, attitudes and screening behaviors in two groups of iranian women: Physicians and non-health care personnel. *J Cancer Educ* 2012;27:770-3.

7. Keith LG, Oleszczuk JJ, Laguens M. Are mammography and palpation sufficient for breast cancer screening? A dissenting opinion. *J Womens Health Gend Based Med* 2002;11:17-25.
8. Zajac P. Breast cancer screening. *Osteopath Fam Physician* 2016;8(5).
9. Nelson HD, Fu R, Cantor A, Pappas M, Daeges M, Humphrey L. Effectiveness of breast cancer screening: Systematic review and meta-analysis to update the 2009 US preventive services task force recommendation. *Ann Intern Med* 2016;164:244-55.
10. Matsuda A, Yamaoka K, Tango T, Matsuda T, Nishimoto H. Effectiveness of psychoeducational support on quality of life in early-stage breast cancer patients: A systematic review and meta-analysis of randomized controlled trials. *Qual Life Res* 2014;23:21-30.
11. Ghaem H, Jafari P, Moslehi S. A comparison of the knowledge of breast self-examination in female students of Shiraz university of medical sciences and those of Shiraz university of sciences, 2004. *Razi J Med Sci* 2008;15:145-53.
12. Bick U, Diekmann F. Digital mammography: What do we and what don't we know? *Eur Radiol* 2007;17:1931-42.
13. Kerlikowske K, Grady D, Rubin SM, Sandrock C, Ernster VL. Efficacy of screening mammography. A meta-analysis. *JAMA* 1995;273:149-54.
14. Kalager M, Haldorsen T, Bretthauer M, Hoff G, Thoresen SO, Adami HO, *et al.* Improved breast cancer survival following introduction of an organized mammography screening program among both screened and unscreened women: A population-based cohort study. *Breast Cancer Res* 2009;11:R44.
15. Kee F, Telford A, Donaghy P, O'doherty A. Attitude or access: Reasons for not attending mammography in Northern Ireland. *Eur J Cancer Prev* 1992;1:311-5.
16. Pormehr SS, Kariman N, Sheykhan Z, Majd HA. Investigation of breast cancer screening tests performance and affecting factors in women referred to Ardebil's health and medical centers, 2009. *J Ardabil Univ Med Sci* 2010;10:310-8.
17. Akhavan-Akbari G, Akhavan-Akbari P. The rate of screening for breast cancer in women in Ardabil. *Breast Cancer*; Shahid Beheshti University of Medical Sciences, Tehran, Iran. *Iran J Obstetr Gynecol Infertil* 2010;12:21-30.
18. Bahrami M, Taymoori P, Bahrami A, Farazi E, Farhadifar F. The prevalence of breast and cervical cancer screening and related factors in woman who refereeing To Health center of Sanandaj City In 2014. *Zanko J Med Sci* 2015;16:1-12.
19. Alavi G, Hoseinnejad J, Masoom A, Shakeri MT. Evaluation of prevalence of cervical and breast cancer screening programs between gynecologists. *Iran J Obstetr Gynecol Infertil* 2010;13:1-6.
20. Khaleghnezhad TN, Khaleghnezhad TA. The assessment of knowledge, attitude and behavior towards breast cancer screening methods among female teachers in Tehran. *Iran J Surg* 2008;16:46-54.
21. Tavakolian L, Boniadi F, Malekzadeh E. The investigation of factors associated with breastcancer screening among Kazeroon women aged 20-65 in 2013. *Nurs J Vulnerable* 2015;1:17-31.
22. Chee H, Rashidah S, Shamsuddin K, Intan O. Factors related to the practice of breast self examination (BSE) and pap smear screening among Malaysian women workers in selected electronics factories. *BMC Womens Health* 2003;3:3.
23. Park SM, Park CT, Park SY, Bae DS, Nam JH, Cho CH, *et al.* Factors related to second cancer screening practice in disease-free cervical cancer survivors. *Cancer Causes Control* 2009;20:1697-703.
24. Kirk JW, Sivertsen DM, Petersen J, Nilsen P, Petersen HV. Barriers and facilitators for implementing a new screening tool in an emergency department: A qualitative study applying the theoretical domains framework. *J Clin Nurs* 2016;25:2786-97.
25. Lorimer K, Martin S, McDaid LM. The views of general practitioners and practice nurses towards the barriers and facilitators of proactive, internet-based chlamydia screening for reaching young heterosexual men. *BMC Fam Pract* 2014;15:127.
26. Mokhtari L, Baradaran RM, Mohammadpour AA, Mousavi S. Health beliefs about mammography and clinical breast examination among female healthcare providers in Tabriz health centers. *Iran J Nur* 2011;24:63-73.
27. Thomas E, Candon ES, Lamyian M, Ahmadi F, Setoode SM, Golkho SH. Exploring Iranian women's perceptions regarding control and prevention of breast cancer. *Qual Rep* 2011;16:1214-29.
28. Akhtari-Zavare M, Ghanbari-Baghestan A, Latiff LA, Matinnia N, Hoseini M. Knowledge of breast cancer and breast self-examination practice among Iranian women in Hamedan, Iran. *Asian Pac J Cancer Prev* 2014;15:6531-4.
29. Ghazdehi MR, Amini L, Parvizi S, Hoseyni AF. Attitudinal barriers to mammography screening among women in Tehran. *J Mazandaran Univ Med Sci* 2013;23:69-75.
30. Naghibi A, Jamshidi P, Yazdani J, Rostami F. Identification of factors associated with breast cancer screening based on the PEN-3 model among female school teachers in Kermanshah. *Iran J Health Educ Health Promot* 2016;4:58-64.
31. Shahrokhi A. General health status of female workers in Qazvin factories. *J Qazvin Univ Med Sci* 2003;28:32-5.
32. Salehi B, Seyf K, Jamilian H, Ghebleh F. Comparison of Mental Health Status between Employed Women in Arak. Arak: University of Medical Sciences and Official Staffs of Education Office, 2008; 2009.
33. Nejati M, Jamali R. Identify and rank the barriers to women's promotion and its relationship with the dimensions of organizational justice: Working women Yazd University. *J Women Stud* 2007;1:56-91.
34. Shanbhag D, Joseph B. Mental health status of female

- workers in private apparel manufacturing industry in Bangalore city, Karnataka, India. *Int J Collab Res Internal Med Pub Health* 2012;4:1893-900.
35. Black CM. Working for a Healthier Tomorrow: Dame Carol Black's Review of the Health of Britain's Working Age Population. London: The Stationery Office; 2008.
  36. Harris JR, Lichiello PA, Hannon PA. Peer reviewed: Workplace health promotion in Washington state. *Prev Chronic Dis* 2009;6:A29.
  37. Ahmadnia SH. Impact of employment on women's health. *J Women Stud* 2004;3:157-78.
  38. Qorbani M, Abdollahi AA, Royani S, Azezi R. Comparison knowledge, attitude and practice of breast self examination in women of Jab in 2009-2010. *J Breast Dis* 2009;2:36-42.
  39. Enjezab B, Farjkhoda T, Bokaei M. Obstacles and stimuli for women to perform diagnostic tests for common cancers in Iran. *J Shahid Sadooghi Univ Med Sci* 2004;12:78.
  40. Abedian-Kasgari K, Shah-Hosseini Z, Adeli H. Women's health beliefs toward mammography in health care centers in Sari in 2004. *Mazandaran J Med Sci* 2006;54:90-8.
  41. Eyvanbagha R, Kamran A, Nasiri K, Habibi A, Mozafari P, Shamkhali R. Knowledge, attitude and practice of female employees in Khalkhal faculty of medical sciences of breast self-examination and its relationship with some individual characteristics. *Taşvîr-i Salâmat* 2016;6:41-7.
  42. Asgharnia M, Faraji R, Zahiri Z, Salamat F, Mosavi CS, Sefati S. A study of knowledge and practice of woman about breast cancer and its screening, in the case of women who referred to alzahra hospital in rasht during 2010-2011. *Iran J Surg* 2013;21:2-9.
  43. Allahverdipour H, Asghari-Jafarabadi M, Emami A. Breast cancer risk perception, benefits of and barriers to mammography adherence among a group of Iranian women. *Women Health* 2011;51:204-19.
  44. Ozmen T, Soran A, Ozmen V. Comparison of barriers against mammography screening in socioeconomically very low and very high populations. *Cureus* 2016;8:e690.
  45. Parsa P, Kandiah M. Predictors of adherence to clinical breast examination and mammography screening among Malaysian women. *Asian Pac J Cancer Prev* 2010;11:681-8.
  46. Othman AK, Kiviniemi MT, Wu YW, Lally RM. Influence of demographic factors, knowledge, and beliefs on Jordanian women's intention to undergo mammography screening. *J Nurs Scholarsh* 2012;44:19-26.
  47. Young RF, Schwartz K, Booza J. Medical barriers to mammography screening of African American women in a high cancer mortality area: Implications for cancer educators and health providers. *J Cancer Educ* 2011;26:262-9.
  48. Peipins LA, Graham S, Young R, Lewis B, Foster S, Flanagan B, *et al.* Time and distance barriers to mammography facilities in the Atlanta metropolitan area. *J Community Health* 2011;36:675-83.
  49. Fayanju OM, Kraenzle S, Drake BF, Oka M, Goodman MS. Perceived barriers to mammography among underserved women in a breast health center outreach program. *Am J Surg* 2014;208:425-34.
  50. Lagerlund M, Hedin A, Sparén P, Thurfjell E, Lambe M. Attitudes, beliefs, and knowledge as predictors of nonattendance in a Swedish population-based mammography screening program. *Prev Med* 2000;31:417-28.

**Source of Support:** Nil. **Conflict of Interest:** None declared.