

REVIEW ARTICLE

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Barriers to breast cancer screening in Iranian females: a review article

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ABSTRACT

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Breast cancer is one of the most common malignancies among females in Iran. Screening and detection in the early stages can increase the likelihood of breast cancer treatment and prognosis, thereby decreasing the mortality rate and promoting patient survival. However, mass screening programs for breast cancer are still confronted by predominant barriers in Iran. We tried to review and recognize the barriers to breast cancer screening and early detection in Iranian females as the main research question. We searched all available databases, and screened manuscripts for eligibility according to our inclusion/exclusion criteria. The search strategy was based on the following keywords: Breast, Malignancy, Cancer, Screening, Early Detection, Mammography, Iran, and Barrier. Responsible authors performed a literature review and compiled the results into a report. Various perceived barriers at different levels (individual, intrapersonal, health systems, and community) play influential and pivotal roles in women's decisions to participate in breast cancer screening programs to facilitate early detection. Lack of awareness, neglect, procrastination, embarrassment, religious beliefs, and lack of primary health workers awareness and recommendation were cited as perceived barriers in screening procedures in Iran. There are still barriers in performing mammography at population levels in five major dimensions including availability, accessibility, cost, fears, and acceptability. However, the rate of regular mammography utilization in Iran is low compared with other countries and needs increasing through informing women. Many perceived barriers can affect women's willingness and self-efficacy in screening procedures and one of the most effective ways of overcoming these barriers is to increase women's awareness.

Keywords: Mammography, women; malignancy, early detection, barrier, screening

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INTRODUCTION

Breast cancer accounts for the largest proportion of female cancer-related deaths and is the first common cancer in more than 140 countries worldwide.⁽¹⁻³⁾ In Iran, the International Agency for Research on Cancer (IARC) reported breast cancer as the most common malignancy in females with an age-standardized incidence rate (ASR) of 31.0 per 100,000 women.^(4,5) Recently, breast cancer has had a decreasing pattern in terms of incidence and mortality in highly developed countries. However, in most under-developed countries we found increasing incidence rates.^(1,6) Lack of early detection and screening programs are the predominant causes of low survival rates of patients with breast cancer. These problems lead to an increase in women's proportions presenting with late-stage disease.^(7, 8) Based on the studies, screening and detection in the early stages can increase the likelihood of breast cancer treatment and prognosis.⁽⁹⁾

The most important way to control and recognize breast cancer in the earlier stages is screening.⁽¹⁰⁾ Breast cancer screening methods include: a) breast self-examination (BSE) b) clinical breast examination (CBE) and c) mammography. Based on the last American Cancer Society screening recommendations for women with an average breast cancer risk, getting regular mammograms is the only effective method in diagnosing breast cancer at an early stage when the treatment process is the most successful; but, research has not shown a clear benefit of regular BSE and CBE.^(11,12) However according to National Comprehensive Cancer Network (NCCN) guidelines, annual clinical breast examination, mammography and breast awareness have been recommended for asymptomatic women aged ≥ 40 years with average risk of breast cancer.⁽¹⁾ It has been established that screening at age 45 or 50 years (as per United States Preventive Task Force/USPTF guideline) results in unnecessary loss of life and more severe adverse effects.⁽¹³⁾

However, mass screening programs for breast cancer are still confronted by some predominant barriers, especially in developing countries.^(14,15) The most important factors affecting the low participation

in different breast cancer screening methods include lack of perceived self-efficacy, lack of motivation for health, and different perceived barriers including a belief that the practices are time-consuming, and embarrassing.⁽¹⁵⁾ Another reason that has affected the commencement of screening programs in most Asian countries, is cultural attitudes. While just less than 20% of at-risk women undergo any provided screening modality, the economic evaluation showed that mammography is the predominant screening method in most Asian countries.⁽¹⁶⁾ Lack of knowledge on the importance of breast cancer screening and its methodology are other major barriers.⁽¹⁷⁻¹⁹⁾ A significant segment of women remains under-screened with mammography due to the fears of cost and availability of mammography, lack of health insurance, mammogram-related pain, positive findings, or fear of a poor outcome during screening, which are other factors that play the role of the most commonly reported barriers to breast cancer screening in developed countries.^(15,20,21)

Many barriers prevent women from commencing screening breast cancer and continue their screening according to their lifetime risk of breast cancer, depending on their family history and age as well as environmental factors.⁽²²⁻²⁵⁾ Some psychological factors may lead to defensive avoidance of screening modalities including mammography and may be the result of anxiety, fear of breast cancer and positive findings, and defensive avoidance beliefs about false positive findings.⁽²⁶⁾ It has also been emphasized that false-positive findings in the screening mammogram lead to psychological distress for up to 3 years, with the result that at least 3% of the women with average risk will be avoiding the next year screening appointments.⁽²⁷⁾ So placement of expert radiologists and breast cancer screening mammogram techniques are important to operate successful breast cancer screening programs. In the present paper, we aimed to review and recognize these barriers in Iran.

Literature search strategy

We tried to review and recognize the barriers to screening and early detection of breast cancer in Iranian females as the main research question of the study. We searched all available databases including

Web of Science (ISI), PubMed, Medline (Ovid), Scopus, Embase, Google Scholar, Journal Citation Reports (JCR), Clinical Key, CINAHL Plus with full text (EBSCO), as English databases, and Scientific Information Database (SID), Magiran, Medlib, and Irandoc as Iranian databases. All manuscripts were screened for eligibility according to our inclusion/exclusion criteria. We did not include any restriction in time, language and type of manuscripts. The search strategy was based on the following keywords: Breast, Malignancy, Cancer, Screening, Early Detection, Mammography, Iran, and Barrier. Responsible authors performed a literature review and compiled the results into a report.

Challenges of breast cancer screening in Iran

There are many prominent barriers to screening in Iran; for instance, most women are unaware of screening methods and cannot have access to the centers of breast cancer screening.⁽⁹⁾ The costs of tests and mammography are also other barriers to breast cancer screening. Unfortunately, in Iran, 82% of breast cancer cases are diagnosed in the late stages, which result in low survival rates and poor prognosis of breast cancer in women.^(9,28,29) Since there is still no national breast cancer screening system in Iran, there are still many barriers that prevent women from undergoing screening. For instance, there is a lack of mammography screening centers, there are no national breast cancer programs, and insurance companies cover only a small portion of the costs.^(7,19,30-32)

The Women Health Volunteers (WHVs) program is an important part of Iranian health services delivery. The WHVs program is interested in local women who are trained to conduct regular home visits to disseminate health messages within their communities. WHVs can play an indispensable role in increasing screening awareness and reducing barriers by dispelling misconceptions and providing comprehensive education to keep women involved in their health.⁽¹⁹⁾ Some cross-sectional studies were performed from different provinces of Iran based on the Women Health Volunteers program, the BSE and mammography. Also, standardized questionnaire-based surveys were performed using the Health Belief

Model to assess women's beliefs concerning breast cancer screening modalities.^(7,17-19)

In another study in Neyshabur city, the investigators checked the validity and reliability of a self-report method, and calculated the effect of awareness and perceived self-efficacy on breast cancer preventive behaviors in women.⁽³³⁾ In another correlational study in 2017, 1509 women in rural and urban areas of Isfahan province were selected using a multistage sampling method. Data were collected by visiting homes, using a questionnaire, and conducting interviews.⁽³⁴⁾ In the Perceived Barriers to Mammography Adoption study, five perceived barriers at different levels (individual, intrapersonal, health systems, and community) were discussed, and all of them have an important role in women's intention to commence screening programs.⁽³⁵⁾ The results revealed that most women who participated in above-mentioned study have never had mammography and were not planning to have one in the future. Lack of any pain or uncomfortable feeling in the breast area is the main reason for not undergoing screening procedures among women. Most women do not begin to undergo any screening because they do not see any breast abnormalities and this misconception is a major reason to fail to undergo screening.⁽³⁵⁾ Also, most of the respondents never performed BSE and only a few of them regularly performed BSE. Sometimes, they are not familiar with performing their regular BSE correctly, and there are no screening centers available to aid and educate them. The rates of performing clinical breast examinations (CBE) and rates of referral to a doctor, were also low.⁽⁷⁾ Unfortunately, most women believe that they would only need screening programs when symptoms are detected. In addition, women are not aware of the opportunity of screening programs and their benefits as well as the timeliness of early detection of breast cancer.^(36, 37)

Another substantial factor that has been studied by Hosseini et al.,⁽³³⁾ in north Khorasan province is Self-Efficacy on Breast Cancer Preventive Behaviors among women. Based on the results of this study, the level of preventive behaviors was low. Also, perceived self-efficacy and awareness, were significant predictor variables for these behaviors in women, and some

women had paid less attention to the aims and benefits of BC screening. They believed that BC is almost familial cancer, and if they do not have any positive family history, they do not need to do the screening.⁽³⁷⁾

Lack of knowledge concerning the objectives and benefits of screening in staff and health-workers among mammography centers, and providing misinformation related to mammography and its possible harms, increased the fear and anxiety of participants and in some cases led to their withdrawal. Fear or worrying about any screening modality, referral to a hospital or medical center, the finding of a lump or cancer, and positive test results were the most common

barriers in most studies.^(7,34) In addition, lack of knowledge about curable cancers, fear of mastectomy and of radical treatments were reported.⁽³⁸⁾ Thus, some people prefer not to get informed at all if they have cancer or at least be diagnosed later so that they can live more easily and without worries instead of dealing with cancer treatment side-effects and costs.⁽³⁹⁾ This shows that primary health workers need in-service training programs. Meanwhile, health policymakers should attempt to increase the related knowledge and application success in health personnel that will affect women in their service area.⁽⁴⁰⁾ The summary results of included studies are presented in Table 1.

Table 1. Summary of the results of related studies

Author, Year	Study Period	Methodology	Place, Population	Number of women included	Age mean \pm SD/ range (years)	Main outcome	Main results
Salmani et al., ⁽¹⁹⁾	June to November 2016	Cross-Sectional, Analytic	11 cities of the Southern Khorasan Province	1,410 Women Health Volunteers	20 to 65 36.16 \pm 8.81	Health beliefs and perceptions about breast cancer and breast cancer screening methods	Iranian Women Health Volunteers had very low adherence to common BSE and mammography practices
Alizadeh-Sabeg et al., ⁽¹⁷⁾	-	Randomized controlled trial (RCT)	20 rural health centers of Abish Ahmad District, East Azerbaijan	120 Iranian rural women	40-69	Effect of motivational interviewing on the change of breast cancer screening behaviors among rural Iranian women	Two months after the intervention, a significant difference was found between the two groups in terms of the stages of change for clinical breast examination and mammography
Shirzadi et al., ⁽³⁵⁾	-	Qualitative component	Tabriz	24 healthy women	40-50: 15 (62.5%) \geq 50: 9 (37.5%)	Qualitatively explore the barriers to mammography adoption among Iranian women	Five main themes were extracted, consisting of unawareness of mammography, fear control, priority of mammography needs, inadequate competency of mammography centers, and a sense of losing family support
Safizadeh et al., ⁽¹⁸⁾	-	Qualitative study, content analysis	Four health centers in Kerman	45 participants	47	Motivational factors for breast cancer screening in Iranian women	Knowledge acquisition, presence of happy-hopeful spirit, positive attitude and self-worth, maternal role, intellectual and financial independence, religious beliefs, motivational fears, and supportive family

Hossaini et al., ⁽⁴⁰⁾	July 2018 to June 2019	Qualitative study, content analysis	Tehran, Iran	21 participants (10 health professionals and 11 female patients with breast cancer)	35-65	Identifying the barriers to early detection of breast cancer in Iranian women	Individual barriers (limited/lack of knowledge, other life preferences, negative reactions to the disease, and belief in fate), environmental barriers (insufficient social support, inaccurate information sources, and alternative therapy recommendation), and organizational barriers (poor quality of Health services, inadequate access to health services, and role of media in informing people).
Mazarei et al., ⁽⁷⁾	-	Cross-sectional descriptive	Health care institutes of Bandar Abbas	370 healthy women	15-79, 55.35±2.27	To determine the knowledge and behavior of women regarding screening for breast cancer	There was a significant relationship between the knowledge and behavior of the subjects
Foroozani et al., ⁽⁹⁾	June 2017 to December 2019	Hospital-based cross-sectional study	Shiraz and Kermanshah	725 patients with newly diagnosed BC	43.7 ± 8.2	Delayed BC diagnosis and late stage presentation of women with BC	Lack of knowledge about BSE, delay at diagnosis
Kardan-Souraki et al., ⁽³⁷⁾	2016	Descriptive cross-sectional	Mazandaran, Sari	1,165 healthy women	(37.15 ± 8.84)	Different factors influence the breast cancer screening rate	The woman's age, age at first marriage, age at onset of sexual intercourse, occupation, spouse's occupation, household income, health status, history of infertility, smoking, and decision-maker on issues of sexual and reproductive health (SRH) were the best Predictors of participation in screening for breast cancer (p<0.05).
Hoseini et al., ⁽³³⁾	2018	Cross-sectional descriptive-correlational	North Khorasan, Neyshabur City	248 healthy women	30-69 (37.12±7.49)	To determine the effect of awareness and perceived self-efficacy of women of Neyshabur city on the preventive behaviors of breast cancer	Self-efficacy and awareness variables significantly predicted %67 of the breast cancer preventive behaviors

Badakhsh et al., ⁽³⁹⁾	2017	Systematic Review	Different regions of Iran	10,521 participants	15-79 (33.5)	To determining attitudes and practice regarding breast cancer early detection techniques	Poor performance and low rates for positive attitudes regarding breast cancer early detection techniques in Iran
Bouya et al., ⁽³⁶⁾	2017	Systematic Review	Different regions of Iran	11,756 participants	15 to 75	To determine the knowledge and source of information about early detection techniques of breast cancer among Iranian women	Only one of Third of women had sufficient knowledge about BSE. The main source of information was healthcare team members
Salek et al., ⁽²⁹⁾	from 1980 to 2012	Retrospective Cross Sectional	Northeastern Iran, Mashhad	4000 female Breast Cancer		To survey the proportion of stages at the presentation of the disease without a screening program, among a population of breast cancer patients	Disease is now presented in its earlier stages even in the absence of a screening program
Ahmadipour et al., ⁽³⁰⁾	April to September of 2015	Cross sectional	Urban health centers in the city of Kerman	240 Healthy women	18-64 (31.7± 7)	The rate of screening participation	The frequency of mammography performance was higher in women with higher education (p=0.01), but there was no statistically significant difference in the frequency of self and clinical breast examinations based on education, household income and employment
Aminisani et al., ⁽³¹⁾	2014	Cross-sectional	Six health centers in Baneh county, Iran	561 healthy women	40-49 (43.64±5.17)	Socio-demographic and health related determinants of participation in breast cancer screening	The overall uptake of mammography was about 17%, and mostly in older, illiterate and post-menopausal women. The main barrier was lack of access to mammography
Ghahremanian et al., ⁽³²⁾	-	Cross-sectional	12 health centers of Tabriz, East Azerbaijan	370 healthy women	Older than 20	To determine relationships of fear and fatalism with breast cancer Screening behavior	Fatalism and fear had a stimulating effects on breast cancer screening performance

From the beginning of October 2016, the integrated health system (*Samaneyeh Iyekparcheye Behdashti* (SIB) system) as an online system has been developed in Iran based on technical knowledge and in line with the latest global technologies in order to provide health services by the Ministry of Health and Medical Education. All information about households, the type of health care services required in community health centers and databases, and health homes were collected and recorded in this system. However, early detection and screening for breast cancer was the most important of the midwife's duties, which also included: following the country guides for breast cancer screening using established guidelines, implementation of the classification of breast imaging-reporting and data system (BI-RADs) and their diagnosis and action, and classification of cases of individual and family history in self-care. With the establishment and development of this program, it is expected that comprehensive screening programs at the population levels, will be launched and integrated in the country soon.⁽⁵⁾

Barriers to screening of breast cancer in Iranian females

Various perceived barriers at different levels (individual, intrapersonal, health systems, and community) play influential and crucial roles in women's decisions to participate in breast cancer screening programs (**Figure 1**).^(35,41) There are still barriers in performing mammography at population

levels in five main dimensions including availability, accessibility, cost, fears, and acceptability.⁽⁴²⁻⁴⁵⁾ Increasing cancer prevention and screening knowledge and individual behavior are the main key factors for accessing and adhering to evidence-based guidelines of breast cancer screening in low- and middle-income countries like Iran.⁽⁴⁶⁻⁴⁸⁾ Multidisciplinary interventions at the health system level are needed to address the barriers that women experience to undergo mammography screening.^(49,50) However, the rate of regular mammography in Iran is low and should increase by informing the women.

While there was not any established and evidence-based screening strategy in the country, we encountered major barriers to performing mammography at average risk at population levels: therefore, CBE and/or BSE may play a role as alternative strategies. Breast self-exams aid to increase breast cancer awareness and get familiar with how breasts look like and feel; therefore, women can alert their healthcare professional if there are any changes. Unfortunately, recently BSE has been recommended as Grade D strategy for breast cancer screening due to related false-positive results and additional psychological harms and fears.⁽⁵¹⁾ However, BSE is so beneficial, inexpensive and simple that it actually can encourage women to take healthy situations into account and aid them to recognize breast cancer in the earlier stages.⁽¹⁹⁾ Based on the results of studies, if women perform regular breast examination and manage it at the time, only 95% of breast cancer cases



Figure 1. Various perceived barriers to screening for breast cancer in Iranian females ^(35,41)

reach advanced stages.⁽⁷⁾ Therefore, when mammography is not available, BSE plays an inevitable role in identifying breast cancer in the early stages.

Studies have indicated barriers consisting of a lack of awareness of the importance and benefits of clinical breast examination and breast self-examination in Iran. Meanwhile, there is a lack of awareness of BSE techniques in individuals and a lack of training by personnel of healthcare centers.⁽⁷⁾ Results of studies show that the most important barriers to Iranian women who do not perform monthly BSE include its being time-consuming, feeling embarrassed, and lack of knowledge to perform BSE. Providing sufficient information regarding early diagnosis and screening programs, curable early stages of cancer, and preventing deaths from breast cancer should be underscored by health policymakers among the populations. Increasing awareness and improving women's beliefs and attitudes toward breast cancer screening are necessary.

CONCLUSION

Many perceived barriers can affect women's willingness and self-efficacy in screening procedures in Iran. Lack of awareness, neglect, procrastination, embarrassment, religious beliefs, and lack of primary health workers' awareness and recommendations were reported. Barriers to performing mammography at population levels were discussed in some main dimensions including availability, accessibility, cost, fears, acceptability, and lack of health insurance, mammogram-related pain, positive findings, simply put receiving bad news during screening.

Since breast cancer incidence, mortality, age pattern and risk factors are completely different in Asian countries, it is felt that we need specific diagnostic and prognostic studies for Asian breast cancer patients. However, implementation of population-based studies on breast cancer patients from various Asian settings is a priority to provide an insight into the effectiveness of different screening modalities in this part of the world. Although we should have essential national breast cancer programs for women in the country and try to make them aware of the importance and benefits of early diagnosis and

screening of breast cancer, one of the most efficient ways is to increase women's awareness about breast cancer.

CONFLICT OF INTEREST

The authors have no conflicts of interest. All authors reviewed the drafts of the manuscript and participated in the interpretation of the results and approved the final version.

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CONSENT FOR PUBLICATION

All authors confirmed any consent for publication.

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CONTRIBUTORS

The authors confirm contribution to the paper as follows: NM, RD: study conception and design; data collection SD, RD, ZS, ZA: interpretation of results NM, RD, SD: draft manuscript preparation. All authors reviewed the results and approved the final version of the manuscript. 

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