Website: http: jebhpme.ssu.ac.ir
EBHPME 2023; 7(2): 158-71
EISSN: 2538-4716

Evidence Based Health Policy, Management & Economics

REVIEW ARTICLE

Factors Influencing Iranian Women's Participation in Breast Cancer Screening Programs: A Systematic Review

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A B S T R A C T

Background: Breast cancer screening programs are one of the most important methods for the early detection of breast cancer in women. Several studies have been conducted to identify factors affecting breast cancer screening behaviors among Iranian women. This study is conducted to systematically review the factors influencing women's participation in breast cancer screening programs in Iran.

Methods: Papers were collected by using the keywords breast, mammary, screening, early detection, diagnosis*, examination, testing, and Iran from various English-language databases, including PubMed, Scopus, Web of Science, and databases in Persian language including SID and Magiran. The search was limited to the title and abstract of papers published between January 1, 2000, and May 1, 2021. A narrative synthesis was performed to summarize findings of the obtained papers.

Results: In this study, 1345 papers were initially found and, after screening the title, abstract, and full-text, 39 papers were selected. Most of them were cross-sectional (n= 28). Results indicated that socioeconomic factors, individual characteristics, recommendation of health workers, knowledge, Islamic beliefs, support by family, and activities of the Iranian government are frequently mentioned as contributing factors and can be applied to increase participation of Iranian women in breast cancer screening.

Conclusion: The results demonstrate that lack of knowledge and a positive attitude towards breast cancer screening is a major problem regarding Iranian women's non-participation in the screening programs. Therefore, the need for regular implementation of the national screening program in the country, providing appropriate educational methods to increase women's awareness, removing barriers and improving women's access to health care providers should be the priorities of the Iranian health system to prevent breast cancer.

Key words: Breast cancer, Screening, Diagnosis, Women's health, Iran

Introduction

Today, the incidence and mortality rate of cancer, as a major health problem in all healthcare systems, is rapidly growing worldwide (1). One of the most prevalent types of cancer in women is breast cancer, which is the leading cause of cancer deaths among women in all countries (2). This cancer is identified as a malignancy which originates from breast tissues of women, often from milk ducts' lining cells (ductal) and lobules around the ducts (lobular) (3). Breast cancer comes with significant economic costs for patients, payers and the community (4). A previous study estimated the total social cost of metastatic breast cancer (MBC) at $ 98,571 per patient per year (5). In 2030, there are an estimated 246,194 MBC cases,

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an increase of 54.8 % compared with the 2015 estimate of 158,997 (4, 6, 7).

Iranian epidemiological model of breast cancer is similar to other Eastern Mediterranean and developing countries (8). According to Iranian Cancer Research Center, about 8500 new cases of breast cancer are reported annually, and there are 1400 deaths from breast cancer each year (9). Moreover, the Iranian Ministry of Health and Medical Education has recently reported that breast cancer accounts for 16 % of cancer cases (10). Previous studies have shown that 23 % of breast cancer cases in Iran have been diagnosed in patients less than 40 years of age, of which 70 % have been recognized in the advanced stage of the disease (11, 12). The incidence of breast cancer can be reduced by early detection through effective measures (13, 14).

Two approaches of screening (early detection) and active preventive intervention have been adopted to reduce the global burden of cancer (15). Breast cancer screening, as a critical early detection method, includes mammography, breast self-examination (BSE), and clinical breast examination (CBE) (16). Regular breast cancer screening programs (BCSP) can reduce breast cancer mortality by about 20 % in women (17).

In this regard, Iran's healthcare system has undergone many improvements since the Iranian revolution of 1979 to meet the health needs of Iran's growing population. The important aims of the current system are to improve Iranian people's health and access to healthcare, and control the spending patterns of health services (18). Early detection of breast cancer is critical, especially in the early stages, to reduce its mortality rate (11, 12).

Iran, as a developing country, introduced the national breast cancer screening program in 2012, and suggested that women over 40 years of age have a mammogram annually. Women 20-40 should have one CBE every three years and annual CBEs after 40 years of age. In addition, females over 20 had better have monthly BSEs (19). Despite this national breast cancer-screening program, evidence suggests that the use of screening methods is not prevalent among Iranian women, and the screening strategy for detection of breast cancer is poor in Iran (20, 21).

Different factors can influence breast cancer screening behaviors among Iranian females. They should be considered in developing strategies to control breast cancer among Iranian women (22). Presenting a comprehensive view of the factors influencing Iranian women's participation in breast cancer screening may provide a useful perspective for policymakers to implement a proper strategy for timely control and detection of the disease. Therefore, this review aimed to identify the factors influencing Iranian women's participation in breast cancer screening programs.

Materials and Methods

Study design

This systematic review was conducted in May, 2021. For the design of study, search protocol, screening, and reporting, the authors used Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guideline.

Search strategy and data sources

A systematic search of PubMed, Scopus, Web of Science, SID, and Magiran databases was carried out. It was conducted using the following medical subject headings (MeSH) and key terms in the title/abstract: breast OR mammary AND screening OR “early detection” OR diagnosis* OR examination OR testing AND Iran. The researchers also used the equivalent of English keywords in Persian-language databases (Magiran and SID). The search was restricted to English and Persian language papers published between January 1, 2000, and May 1, 2021.Furthermore, a manual search in Google and Google Scholar was conducted to identify additional studies/reports that have not been retrieved by initial search. Finally, the selected papers' references (reference by reference) were reviewed. The literature search strategy in PubMed was as follows:

(Breast [Title/Abstract] OR mammary [Title/ Abstract]) AND (screening [Title/Abstract] OR "early detection" [Title/Abstract]) AND (Iran [Title/Abstract])

Inclusion and exclusion criteria

Papers meeting the following criteria were included in the synthesis: 1) They were conducted in Iran, and 2) Published in a peer-reviewed journal, 3) the language was both English and Persian, 4) factors affecting the participation of Iranian women in breast cancer screening were reported, 5) participants were aged 18 or above, and 6) Papers were published online between January 1, 2000, and January 1, 2021. The last search to identify the most recent publications was conducted on January 1, 2021.

Studies were excluded if: 1) they were abstracts of the conference, comments, letters, opinion articles, reviews, or case reports, 2) they were duplicate publications, 3) papers which included insufficient data, 4) those which reported the reasons for delays in breast cancer treatment (not diagnosis) And 5) the papers that only surveyed women's knowledge, attitudes, and susceptibility to breast cancer, and did not mention factors related to the participation of women in screening programs.

Study selection process

All identified studies were entered into Endnote software. All publications were evaluated by two researchers who were experts in systematic review and were sufficiently familiar with the topic. In the primary stage of screening, duplicate records were removed. Then, the titles and abstracts of the papers were reviewed based on the inclusion and exclusion criteria. Finally, the full texts of the remaining studies were thoroughly reviewed and the ones included were entered into the synthesis.

Data extraction and quality assessment

To extract data, a checklist was designed in the Microsoft Word software (version 2016). The checklist included the name of the first author, publication year, the city of study, research design, study population (N), data collection method, and findings (the most important identified factors).

The Critical Appraisal Skills Program (CASP) checklist was used to evaluate the selected studies in relation to various aspects of the methodology and procedure. Studies were scored as follows: If a paper scored less than 30 % of the checklist, it was considered poor, and if it scored between 30 % and 70 %, it had a medium quality, and if scored above 70 %, it had a good quality. Furthermore, based on the score range, poor-quality papers were excluded.

Evidence analysis

After deciding on the included studies, authors performed a narrative synthesis to summarize the findings of different papers. The three stages of narrative synthesis included development of an early synthesis, exploring relationships within and between studies. For this purpose, the data of the entered studies were qualitatively described and presented. Authors met frequently to discuss and reach a consensus on the findings.

Results

Search results

The search in online databases and Google Scholar resulted in 1345 papers, of which 989 were retrieved after deleting the duplicates. After screening the titles and abstracts, 192 papers met the eligibility criteria. Based on the review of full-texts, 35 papers met the criteria for inclusion in the final evidence synthesis. Moreover, four papers were added after reference screening (reference by reference). There were duplicates because they were published in either English or Persian or in two or more journals (Figure 1).

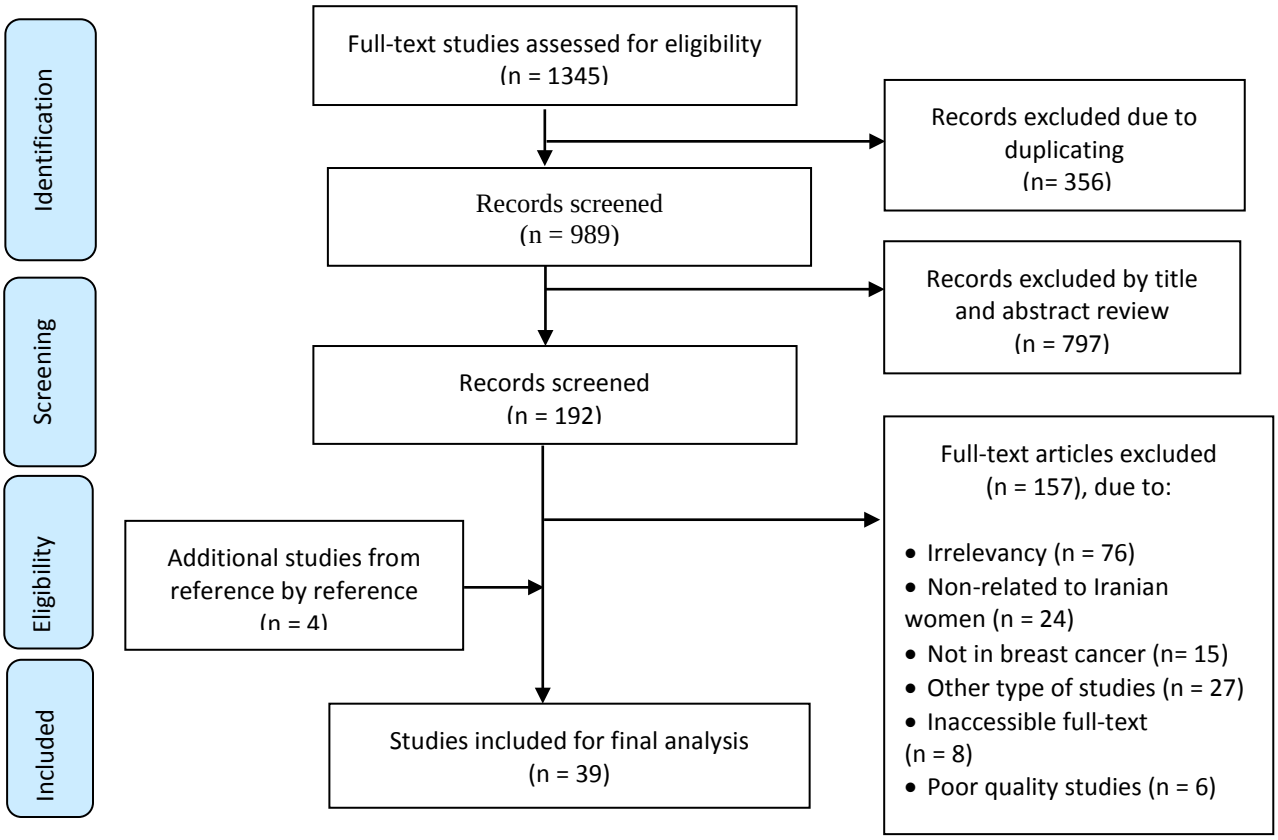

Figure 1: Search results and publication selection procedures

Characteristics of the included papers

28 studies were cross-sectional, 12 were qualitative studies, one was mixed-method, and one was case-control. All types of documents were included with a focus on papers in primary research. Most of their populations were females who were referred to healthcare centers or hospitals (20 studies). In cross-sectional studies, the sample size ranged from 90 to 117679 participants. Most of the studies were conducted in Tehran (16 studies). Almost all the assessed studies were generally of high quality although six papers were excluded based on the level of quality appraisal. The general characteristics of the included studies in this review are shown in Table 1.

Principal findings

Based on the results of this review, factors influencing women's participation in breast cancer screening programs were social and economic (income, education, employment, community culture, and social supports), individual characteristics (age, marital status, education level, personal and family history of breast problems, and self-care), recommendation (from physicians, midwives, and health center staff), and cancer-related fear (fear of cancer diagnosis, pain, radiation, death). Other factors frequently found to be positively associated with the performance of breast cancer screening included lack of knowledge, being time-consuming, perceived high costs, embarrassment over screening, mass media advice, low self-efficacy, fatalism, forgetfulness, and negligence.

Based on breast cancer screening, there are at least two competitive normative frameworks in which Muslim women operate in Iran. The first refers to cancer fatalism (describing the belief that individuals are incapable of preventing, diagnosing, or reversing the disease) and the second refers to God's command to accept responsibility for human actions. Therefore, religious beliefs and spirituality impact Iranian women's participation in breast cancer screening programs.

This study declared that the activities of the Iranian government, including governmental support for women, raising awareness of the importance of programs, training healthcare workers, and providing health services and health insurance can encourage Iranian women to regularly participate in breast cancer screening programs. Further details of the findings of this review about the most important identified factors affecting Iranian women's participation in BCSP are given in Table 2.

Table 1. Summary of the Characteristics of the Included Studies in the Systematic Review

No	Author/ Year of Publication	City	Design of the study	Study population (N)	Method of data collection
1	Jarvandi et al. (23) 2002	Tehran	Cross-sectional	Iranian female teachers (578)	Questionnaire
2	Montazeri et al. (24) 2003	Tehran	Cross-sectional	Muslim women (485)	Questionnaire
3	Anjazab et al. (25) 2004	Yazd	Cross-sectional	Women referred to health center (400)	Questionnaire
4	Harirchi et al. (26) 2005	Tehran	Cross-sectional	all consecutive women with advanced breast cancer (stages IIb, III, or IV) (200)	Questionnaire
5	Lamyian et al. (27) 2007	Tehran	Qualitative study	Women from municipal culture house (Misagh) and the Iranian Centre for Breast Cancer and the participants' home or workplace (31)	Individual interview
6	Yavari and Pourhoseingholi (28) 2007	Tehran	Case-control study	Case subjects are female patients Having breast cancer (300) and the control group match the case group regarding age (300)	Questionnaire
7	Montazeri et al. (22) 2008	Tehran	Cross-sectional	Female population aged 20 to 80 (117679)	Questionnaire
8	Tavafian et al. (29) 2009	Bandar Abbas	Cross-sectional	Women older than 30 (240)	Questionnaire
9	Hatefnia et al. (30) 2010	Tehran	Cross-sectional	Women working in 12 factories (320)	Questionnaire
10	Khalili and shahnazi (31) 2010	Tabriz	Cross-sectional	All the women referred to health care centers (400)	Questionnaire
11	Soltanahmadi et al (32) 2010	Kerman	Cross-sectional	Married women who referred to five distinct clinics (200)	Questionnaire
12	Ahmadian et al (33) 2011	Tehran	Cross-sectional	Women from hospitals affiliated to Tehran University of Medical Sciences (400)	Questionnaire
13	Keshavarz et al (34) 2011	Pakdasht	Qualitative study	Working women (70)	Interview

No	Author/ Year of Publication	City	Design of the study	Study population (N)	Method of data collection
14	Thomas et al (35) 2011	Tehran	Qualitative study	Iranian women and health care professionals (31)	Individual and focus group interviews
15	Nafisi et al (36) 2011	Tehran	Cross-sectional	Women who referred to health centers (650)	Questionnaire
16	Ahmadian et al (37) 2012	Tehran	Cross-sectional	Women who were asymptomatic of BC (400)	Questionnaire
17	Khalili and shahnazi (38) 2012	Tabriz	Cross-sectional	Women referring to health Care Centers (400)	Questionnaire and observational checklist
18	Ghazdehi et al (39) 2013	Tehran	Cross-sectional	Women referring to clinics (900)	Questionnaire
19	Akbari et al. (40) 2014	Kashan	Cross-sectional	Women referring to health centers (233)	Questionnaire
20	Khazaee-pool et al. (41) 2014	Tehran	Qualitative study	Women who had never been screened for BC (16)	semi-structured interview
21	Nojomi et al. (42) 2014	Tehran	Cross-sectional	Women who had attended primary health-care centers (1012)	Questionnaire
22	Pilehvarzadeh et al. (43) 2014	Jiroft	Qualitative-Quantitative study	Women (200)	Questionnaire and interviews
23	Taymoori et al. (44) 2014	Sanandaj	Cross-sectional	Women from primary healthcare centers (686)	Questionnaire
24	Farhadifar et al. (45) 2015	Sanandaj	Cross-sectional	Women from health care centers (375)	Questionnaire
25	Naghibi et al. (46) 2015	Sari	Cross-sectional	Women between the ages of 20 and 49 in 12 health centers (415)	Questionnaire
26	Tavakolian et al. (47) 2015	Kazeron	Cross-sectional	Women from referred to health centers (300)	Questionnaire
27	Abolhasan et al. (48) 2016	Kermansh ah	Cross-sectional	High school teachers (258)	Questionnaire
28	Anbari et al. (49) 2016	Khorrama bad	Cross-sectional	Women in referred to health centers and hospitals (457)	Questionnaire
29	Mirfarhadi et al (50) 2017	Rasht	Cross-sectional	Women had referred for checkup (232)	Questionnaire
30	Safajou et al (51) 2017	Birjand	Cross sectional	Female nursing and midwifery personnel working in hospitals (202)	Questionnaire
31	Monfared et al. (52) 2017	Rasht	Cross-sectional	Female of resident in city (1000)	Questionnaire

No	Author/ Year of Publication	City	Design of the study	Study population (N)	Method of data collection
32	Hayati, and Rouhandeh (53) 2018	Abadan	Cross-sectional	Female employees in School of Medical Sciences and School of Nursing and Midwifery at Islamic Azad University (90)	Questionnaire
33	Noori, and Schouten (54) 2018	Tehran	Qualitative study	Women (22)	Interviews
34	Safizadeh et al (55) 2018	Kerman	Qualitative study	Women among health centers (24)	Focus groups
35	Savabi-Esfahani et al. (56) 2018	Isfahan	Qualitative study	Gynecologists, radiologists, surgeons, general physicians, midwives, and policymakers (31)	Interview
36	Khazir et al. (57) 2019	Khorramabad	Qualitative study	Women aged 40 and older, a gynecologist, and a general surgeon (22)	Interview
37	Moghaddam et al (58) 2019	Isfahan	Cross-sectional	Female teachers (192)	Questionnaire
38	Ghanbari et al (59) 2020	Rasht	Cross-sectional	Married women (1472)	Questionnaire
39	Shirzadi et al. (60) 2020	Tabriz	Qualitative study	Women (24)	Interview

Table 2. The most important identified factors affecting Iranian women's participation in BCSP

Fear (23, 25-27, 31-33, 36,38, 40, 41, 43, 46, 48-51, 53-60)
Lack of awareness (22-26, 28, 30, 32, 35-37, 41, 42, 48, 49, 51-55, 58, 60)
Lack of access to information (34, 35, 40, 27)
Time-consuming (23-25, 29, 31, 32, 34, 36, 44, 46-53, 57, 58)
Religious beliefs (24, 30, 48, 49, 58)
Self-examination is troublesome (24, 27, 31, 34, 37, 43, 44, 46, 49)
Embarrassment (25, 31-33, 38, 39, 41, 47, 49, 51, 55-57)
Access to health centers and services (25, 26, 34, 40, 46-48, 50, 55, 58, 60)
Cost and low income (26, 28, 31-38, 42, 47-50, 52, 53, 56-60)
Lack of training programs (22, 25, 28, 43)
Negligence and laziness (25-27, 32, 35, 36, 38, 39, 41, 44, 46, 48-52, 55, 56, 58)
No history of problems (25, 30, 31, 38, 48, 52, 54)
No family history of BC (32, 40, 50)
Disbelief in screening (25, 39, 48, 51, 56-58)
Lack of government and community support (25, 45, 55, 57, 60)
Distance from health centers (32, 33)
Disrespect for the privacy of individuals (34, 57)
Feeling pain (34, 40, 48, 53, 54, 57-59)
Not recommended by a doctor (51, 52, 59)
Cultural barriers (35, 54, 55)
Husband’s disagreement with screening (23, 28, 46, 57, 58)

Discussion

The present systematic review identified factors influencing Iranian women's participation in breast cancer screening programs. Results indicated major factors hampering Iranian women’s participation in programs, which should be addressed in order to persuade them to participate by removing barriers and using facilitators.

Nowadays, the best strategy to avoid having breast cancer is performing regular screening to improve women's self-efficacy. Mammography is the best method for breast cancer's early diagnosis; but, the rate of mammography screening among women in Iran is lower than in developed countries such as the United States and Britain (19). The most important reasons for the low rate are the absence of an orderly breast cancer screening program, the high cost of mammography, and the lack of a cost-effective method for breast cancer screening in Iran (21, 61). As investigated on the Iranian population (2007), about 40 percent reported having insurance or a private doctor as the main reason for performing a diagnostic mammography outside the public hospital system (62). These results show that mammography can be very useful; however, the main problems are accessibility and high costs. To solve this problem, Iran government must implement a free mammography screening program for high-risk groups (63).

Several factors affecting the participation of women in breast cancer screening have been discovered. Iran provinces have a variety of cultures, conditions, and economic status. Sociocultural, religious beliefs, demographics, environmental issues, family history, family support, and psychological factors have all been shown to influence Iranian women's participation in breast cancer screening (32, 45).

Lack of awareness and positive tendency towards breast screening are the main obstacles for many of Iranian women. Obtaining information (through personal studies, friends, and media) can increase women's knowledge and improve breast cancer screening (40). Thus, providing more educational programs aiming to change behavior while considering women's beliefs, and explaining the benefits of screening for the disease is an essential action (40, 46). Moreover, individuals' higher education can be an effective factor in screening among women (64). Based on a previous study, there was a positive relationship between the internet or computer-based patient education program and the knowledge level of patients about breast cancer, and health professionals should expand BCSP with the strategy to use the internet or computer-based programs (65).

Medicine and hygiene have been important factors of Islam which go back to the early years of Islam. But Muslims, and especially women, may avoid seeing a doctor because of cultural concerns such as the embarrassment of screening rather than religious criticism (25, 32, 55, 66). There is a strong cultural belief among Iranian women that breasts are sexual organs that should not be talked about publicly, although there is a tendency to participate in breast cancer screening. Therefore, as mentioned, 98% of the Iran's populations are considered Muslim, and religious beliefs impact health-seeking behaviors (41, 67). It has been demonstrated that religious beliefs can have a negative or positive effect on screening activities for women in Iran (3, 67, 68). Thus, recommendations from health professionals, policymakers, and religious leaders are essential to convince women that their religion can improve their health behavior, especially through breast cancer screening (30, 69). Therefore, training programs and support of religious leaders regarding the significance of breast cancer screening should be a vital part of an effective intervention method in the health systems of Muslim countries (30, 70).

A study indicated that fear and anxiety were major factors in breast cancer screening behavior among women (71). Fear and anxiety about screening can be due to the method of performing the screening, the results of the screening, or the fear of breast cancer, which are psychological barriers (57, 58). Other reasons for the fear include negative experiences and the bad behavior of healthcare professionals, for which social and family support can be effective and helpful (27, 48, 56). The role of healthcare professionals, especially midwives, is important in encouraging women to undergo breast cancer screening. The results of a 2017 study revealed that a support and counseling program by midwives could have a positive mental impact on

women to participate in screening (72). Generally, women's participation in a screening program can be influenced by acceptability, accessibility, promotion of screening and capacity of the screening project (73).

According to a study by Mottram et.al, women with lower socioeconomic status, those who were immigrants, non-homeowners, and those with previous false-positive results were less likely to participate in screening programs. Thus, changes in service delivery, screening programs, and population awareness may affect the findings (74). In another study, open access to physicians' care and screening recommendations increased participation (75). According to a systematic review conducted in China, there is a wide range of factors that affect the involvement of breast cancer screening in China, including geographical area, personal history of breast disease, past screening behaviors, physical examination, and availability of medical professionals, equipment, residential area, ethnicity and attitude towards breast cancer screening (76). The findings of this study are consistent with the results of the present study.

Therefore, according to the results of this study has been done, a comprehensive view of the factors influencing Iranian women's participation in screening programs and facts about improving breast cancer's early diagnosis in Iran are obtained. Thus, the urgency of a national screening program in the country, presenting suitable educational methods for raising women's awareness, removing barriers, and improving women's access to healthcare providers should be the priorities of the Iranian healthcare system to prevent breast cancer. Breast cancer screening programs in the Iranian healthcare system, if properly implemented, can reduce the incidence and mortality rate among Iranian women by prevention and early detection of the disease and providing appropriate services to them. This review thoroughly extracted the factors affecting Iranian women's participation in BCSP in different cities of Iran with a large sample size, and its results can guide policymakers in identifying the problems of these programs.

Future research is suggested to specify the infrastructure needed for the participation of more women in breast cancer screening programs. Many more intervention studies are recommended in this area to assess the women's sensitivity, as well as the accessibility, cost-effectiveness, and long-term effects of the programs. Future research could help assess women's and providers' satisfaction with breast cancer screening programs.

This study has low generalizability to other countries due to the factors influencing women's participation in BCSP in Iran. Furthermore, some studies may not have been identified via this search strategy, although the authors did their best to adopt an accurate search strategy and access a wide range of evidence in online databases.

Conclusion

Today, based on studies, the best strategy to prevent breast cancer is to screen women regularly. By preventing and diagnosing this disease at early stage, and providing appropriate services to patients, the incidence and mortality rate of Iranian women will be reduced. The results suggest that there are major factors that hinder participation of Iranian women in breast cancer screening programs. They include lack of knowledge and a positive attitude towards breast screening. Patients should be encouraged to participate in these programs by removing barriers and using facilitators. Authorities should focus on factors to improve breast cancer screening and gradually make it a national program in Iran. Therefore, the need to implement a national screening program in the country, provide appropriate educational methods to increase women's awareness, remove barriers and improve women's access to healthcare providers should be one of the priorities of the Iranian health system to prevent breast cancer. The results can be useful for policymakers in removing barriers to women's participation in breast cancer screening programs and improving these programs' efficacy.

Acknowledgements
Non applicable.

Conflict of interests
The authors declared no conflict of interests.

Authors' contributions
Hajizadeh A, Monaghesh E, and Mohammaddokht S designed research; Amanzadeh J, Monaghesh E and Mohammaddokht S conducted research; Hajizadeh A, Amanzadeh J and Dorri Kafrani S analyzed data; and Mohammaddokht S, Hajizadeh A and Amanzadeh J wrote the paper. Hajizadeh A had primary responsibility for final content. All authors read and approved the final manuscript.

Funding
Non applicable.

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