

RESEARCH ARTICLE

Participation of the Women Covered by Family Physicians in Breast Cancer Screening Program in Kerman, Iran

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Abstract

Background: Mammography screening is a method for reducing breast cancer mortality in women over 40 years old. A participation rate of at least 70% is a prerequisite for screening programs. This study aimed at determining the participation rate of women in breast cancer screening in Iran. **Materials and Methods:** The study population in this prospective research consisted of 35 to 69 years old women in the villages and towns Kerman District, in 2013. The data were collected by a well-validated risk assessment questionnaire. The questionnaires were completed with the help of health workers and technicians in the health centers, who were trained on breast cancer screening program. **Results:** As a whole, 19,651 women were invited to complete the questionnaire, of whom 15,794 women (80.37%) completed it. In the urban region, of 3150 eligible women 2728 women (86.60%) participated in the study. The acceptance rates for mammography in rural and urban regions were 34.95% and 8.75%, respectively. **Conclusions:** Finally, 3.8% and 16.34% of 35 to 69 years old women in the urban regions were mammographed, respectively. **Conclusion:** The low participation of eligible women in breast cancer screening program alerts us against including the program in the health insurance package.

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Introduction

Breast cancer is the most common cancer among women worldwide (Alsanabani et al., 2015). According to the WHO, 1.38 million new cases (23% of all cancers) have been estimated to occur in 2008. Mortality from breast cancer is high, so that 458 million people lose their lives annually worldwide from this type of cancer. The annual rate of new cases in Iran is 5692 (22% of all cancer cases among women), and the mortality rate is estimated 2614 cases per year (Kalili et al., 2014).

Patients' mean age is low in developing countries like Iran, thus the costs of lost production are increased due to the premature deaths, and hence proper intervention is necessary for more effective treatment of patients and improvement of survival and effectiveness (Davari et al., 2013). To detect breast cancer at an early and treatable stage through screening has been proved effectively to reduce mortality and better patients' quality of life (Huang et al., 2011). Mammographic screening is a method of reducing deaths from breast cancer for women aged 40 and above (Greif, 2010). The goal of screening programs

is to diagnose the disease after the onset and before leading to clinical symptoms (Farshbaf Khalili et al., 1999). Screening programs for breast cancer can be performed in two ways: A) general screening in which, based on the summary of international recommendations and national epidemiological conditions, the best protocol is to perform mammography in all women age 40 to 75 years every two years (Lebovic et al., 2010), and B) selective screening for women with suspected BRCA1 (breast cancer type one susceptibility protein) and BRCA2 (breast cancer type two susceptibility protein) genes mutation according to their familial history. The strongest risk factor is the familial history. This method of screening is already being performed in the form of surveillance (Kösters et al., 2003; Independent UK Panel on Breast Cancer Screening, 2012).

Participation rate is an indicator for evaluating the performance of a screening program (Moutel et al., 2014). In order to maximize the impact of cancer screening programs on population health, high screening rate is essential (Goto et al., 2015).

In a study in Norway, Gramm and Lund (2008) reported a relatively high participation rate of the invited population

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to a cancer screening program of 80.1 percent in the main group and 74.8 percent in the control group in the first year. Harris (2003) concluded that people who do not participate in the breast cancer screening programs are mostly those who are less aware of the benefits and importance of this measure (Harris et al, 2001). Khalili et al. (2013) showed that people's decisions to participate in breast cancer screening methods depend on their beliefs and attitudes (Kalili et al., 2014); therefore, this study aimed to determine the rate of participation of 35 to 69 years old women in the villages and towns with a population of less than 20,000 covered by family physicians in a breast cancer screening program in Kerman.

Materials and Methods

The study population in this prospective research consisted of 35 to 69 years old women. The study was performed over a year (2013) in Kerman, the southeast of Iran. The research design was approved by the university ethics committee. Screening program was conducted in the villages and towns with a population of less than 20,000 covered by family physicians in Kerman with a population of about 19,651 and the urban region in Kerman with a population of about 3150. Screening was conducted in three phases:

Phase I: Risk assessment using the questionnaire

The questionnaire included demographic characteristics, city, Health center, Health houses or Health station, questioner's name, phone number, and questions related to breast cancer risk assessment (Table 1). These questions consisted of age at menarche, parity, age at first childbirth, labor with at least 8 months of pregnancy, breastfeeding, family history of breast cancer, previous benign breast tumors, other previous cancers, history of oral contraception consumption, and history of hormone therapy of the participants (Wu et al., 2006). Three questions were also added to the questionnaire and regardless of scores, a positive answer to these questions meant that the person was "at risk for familial breast cancer" and was qualified for mammography in the next stage (Hughes et al., 2003). After an extensive literature review and use of items of screening models of people at risk for breast cancer in different studies (Gail and Taiwan models) on the one hand, and considering risk factors for breast cancer in Iran on the other hand, the research team decided to apply the two-phase strategy of Taiwan (questionnaire and mammography) in this study, given the relative similarity of breast cancer incidence in Iran and Taiwan (shen et al., 2000; IARC, 2008; Salim et al., 2009), high cost of screening for people and government, weak infrastructure, and low public awareness and sensitivity (Kösters et al., 2003; Wu et al., 2006). The content validity of the questionnaire was approved by the researchers, and the questionnaire was repeated on 30 participants two weeks later to assess its reliability. Evaluation of consistency between the items of the questionnaire showed a proper reliability. After completing the questionnaire and provision of diagnostic imaging, if a person was suspected to or had breast cancer, the patient and her family were

informed observing professional ethics and patient rights and maintaining confidentiality. The patient was then introduced to the relevant facilities for continuation of treatment.

First, health workers and behvarz in Health houses (n=56) and Health stations (n=20) in Kerman as well as staff in the urban health center were trained in briefings on the goals of the project and on how to complete the questionnaire. The development unit of the city health center was responsible for overseeing the completion of the questionnaire through the relevant ports. Women in the target group in the villages and towns with a population of less than 20,000 were invited to the study through oral invitation by health workers and liaisons and banners installed at the entrance to mosques, Health houses, Health stations, and crowded areas, while women in the urban region were invited through house-to-house invitation by health liaisons. The screening program was started from the first level of care (i.e., the first level contact with the healthcare system with the public) at health houses in the villages and health stations in towns with less than 20 thousand people through registration and calling the target group of women, and in the urban region at the volunteers' doors. After completing the questionnaire and entering data in the software, 3000 questionnaires related to the villages and towns with a population of less than 20,000 were randomly evaluated at this stage, while all completed questionnaires of the urban region were studied.

Phase II: Identifying the individuals qualified for mammography

According to the Taiwan's model and using Equation 1, in all studied regions, women with questionnaire scores of above -6.5 (Wu et al., 2006) and those with an evident risk score of familial breast cancer (Hughes et al., 2003) were referred for mammography in the second phase. The equation and questions were as follows (Wu et al., 2006).

$$\text{Equation 1: Score} = (-0.03.X_1) + (2.X_2) - (2.X_3) - (5.X_4) - (6.X_5) - (9.X_6) + (0.5.X_7) + (1.5.X_8) - (3.X_9) + (9.X_{10}) + (7.X_{11}) + (8.X_{12}) + (2.X_{13}) + (3.X_{14})$$

Phase III: Selective screening with mammography

The eligible women were referred for mammography at this stage. The prepared mammograms were reviewed by the radiologists of the center and the comments were recorded. Some participants with incomplete assessment were introduced for an ultrasound or a second mammography. Mammography and ultrasound were performed for free. People with preliminary to advanced breast cancer were identified. Mammography reports were based on the BI-RADS (Breast Imaging-Reporting and Data System), and needle biopsy was performed by the radiologist on women with a mammogram score of higher than 4 and those with suspected ultrasound (Wu et al., 2006). Finally, the participation rate of women was calculated, and the effect of demographic factors (marital status, education, age), on the participation rate was analyzed in SPSS using logistic regression.

Results

Given that from 19,651 women of 35 to 69 years old eligible for questioning, a total number of 15,794 women Table 3 shows that of 610 women referred for mammography in the villages and towns of a population of less than 20,000, the number of mammograms was normal in 88.03% of the case, required ultrasound in 9.83% of the case, required a second mammography in 1.63% of the case, and required biopsy in 0.49% of the cases. In the urban region, the need for ultrasound, second mammography, and biopsy were 90.84%, 5.84%, and 1.66%, respectively.

Completed the questionnaire in the villages and towns of a population of less than 20,000 (80.37%). Therefore, in order to actually calculate the final participation, 3733 women were considered qualified for questioning in the

villages and towns with a population of less than 20,000. Table 2 shows that 80.37% of 35 to 69 years old women in the villages and towns with a population of less than 20,000, and 86.60% in the urban region participated in the questioning phase. According to the risk score of higher than -6.5, the number of eligible women for mammography was 1745 and 1370 individuals in the villages and towns with a population of less than 20,000 and the urban region, respectively. Participation of women in completion of the questionnaire was 86.60% in the urban region and 80.37% in the villages and towns with a population of less than 20,000. Participation in mammography in the urban region and the villages and towns with a population of less than 20,000 was 8.75% and 34.95%, respectively. The final participation rate of

Table 1. Variables for Breast Cancer Risk Assessment

Variable	Definition
Screening age (X_1)	
Age at menarche (X_2)	>14 versus <14
Age at first childbirth (X_3 - X_6)	0 versus 1 0 versus 2 0 versus 3 0 versus <4
Age at first full-term childbirth* (X_7 - X_8)	25-29 versus >25 >25 versus <<30
Breastfeeding (X_9)	Yes versus No
History of familial breast cancer (X_{10})	Yes versus No
Previous benign breast tumor (X_{11})	Yes versus No
Other previous cancers (X_{12})	Yes versus No
History of oral contraceptive (X_{13})	It is consumed yet after the age of 45 years
History of Hormone replacement therapy (X_{14})	At least 5 years of consumption, and consumption during the last 5 years

* At least 8 months of pregnancy

Table 2. Participation Rate of 35 to 69 years Old Women in the Urban Region and in the Villages and Towns with a Population of Less than 20,000

	Urban region	Villages and towns with less than 20 thousand people
Number of 35-69 y/o women (eligible for questioning)	3150	3733
Number of completed questionnaires	2728	3000
Number of women eligible for mammography	1370 (50.21%)	1745 (58.16)
Number of performed mammography's	120	610
Participation in completing the questionnaire	86.60%	80.37%
Participation in mammography (Uptake)*	8.75%	34.95%
Final participation (Coverage)**	3.80%	16.34%

Table 3. Distribution of the Results of Mammography among Women in the Urban Region and in the Villages and Towns with a Population of Less than 20,000

		Normal	Need for ultrasound	Need for a second mammography	Need for biopsy
Villages and towns with a population of less than 20,000(n=610)	Number	537	69	10	3
	Percent	88.03	9.83	1.63	0.49
Urban region (n=120)	Number	109	7	2	2
	Percent	90.84	5.84	1.66	1.66

Table 4. Distribution of Educational Level among 35 to 69 Years Old Women who Completed the Questionnaire

		Illiterate	Primary School	Middle and high school	Diploma	academic	Seminary	Total
Villages and towns with a population of less than 20,000(n=610)	Number	806	1059	623	366	141	5	3000
	Percent	26.87	35.3	20.76	12.2	4.7	0.16	100
Urban region (n=120)	Number	353	620	500	844	406	5	2728
	Percent	12.93	22.73	18.33	30.94	14.89	0.18	100

Table 4. Demographic Characteristics Related to Participation of 35 to 69 Years old Women in the Urban Region in the Final Model of Logistic Regression

Variable	Adjusted OR	CI 95%	P-value
Marital status	1.09	0.69-1.70	0.7
Education	0.83	0.68-1.01	0.07
Age	0.98	0.96-1.01	0.37

women in the urban region was 3.8%. It was 16.34% in the villages and towns with a population of less than 20,000.

Table 4 shows that of 3000 women who completed the questionnaire in the villages and towns with a population of less than 20,000, 2854 (95.13%) held diploma or under the diploma, and 146 (4.87%) had a academic or seminary degree, and of 2728 women in the urban region, 2317 (84.93%) held a diploma or under diploma, and 411 (15.06%) had a academic or seminary degree.

Factors affecting the rate of participation were analyzed using logistic regression. As Table 5 shows, the women’s participation was significantly associated only with education at the level of 10% (0.07), while it had no significant relationship to marital status (0.7) and age (0.37). Marital status increased the chance of mammography, i.e., the married women were more frequently referred for mammography compared to the single women. Other variables mentioned in Methodology section had no significant relationship to the rate of participation.

Discussion

Participation rate is one of the indicators for evaluating the performance of a screening program (Moutel et al., 2014). To be cost effective, breast cancer screening program must include 70% of women in the target age group (The National Library of Australia Cataloguing-in-Publication entry, 2010). Results showed that, the final participation rate of women was 3.8% in the urban region and 16.34% in the villages and towns of a population of less than 20,000. According to Moutel, et al (2014), the rate of participation of 50 to 74 years old people in a screening program in France in 2012 was 52.7%, which was far below the goal of 70% (Moutel et al., 2014); however this participation rate was higher than that of the present study. It was concluded with a study in Norway in 2008 that the rate of participation in a cancer screening program was 80.1% in the main group and 74.8% in the control group in the first year. This research showed the relatively high participation of the invited population in the screening program (T Gramand and Lund, 2008). Results of NHS cancer screening programs (2007) showed a participation rate of 75% for the women invited for the breast cancer screening program (NHS Cancer Screening Programmes, 2005). In a study in Kerman by Soltan Ahmadi (2009), the participation rate was low (22.5%), however, a majority of women were aware of breast self-examination as a screening method. The participation rate for this study however was higher than that of Secginli and Nahcivan in Turkey (17%), Mojahid et al in Yazd (14.46%), Lee in Korea (12.3%), and Banaian et al in

Boroोजen (4.5%) (Soltan Ahmadi, 2010).

Instructions in Europe emphasize a participation rate of 70% for those invited to a breast cancer screening program (Perry et al., 2006). In the present study, the participation rate of invited women was 8.75% in the urban region and 34.95% in the villages and towns with a population of less than 20,000. In the study by Wu in Taiwan (2006), the rate of participation in the mammography phase was 59%, with a final participation of 32%, which was lower than the standard but higher than our study (Wu et al., 2006). Poole, et al (2008) found that only 49% of the 50-69 years age group was referred for mammography, which was lower than 70% recommended in Canada (Poole et al., 2008). Women’s participation in 2002 in southern Australia was 63.1% in the target age group, 79.1% of which were mammographed in 2004 (The National Library of Australia Cataloguing-in-Publication entry, 2010).

Bonfill, et al (2009) stated that a high participation rate with in the community is a requirement for any screening program. Participation rate of at least 70% is a goal for screening programs, and low participation rates are unfavorable for a population-based screening program, because the program cost-effectiveness would be very low (Cosp et al, 2001). The participation rate was very low in this study. The obstacles against the participation of women in screening programs may include lack of recommendation by physicians, unawareness about the programs methods, no history of breast disease, neglect, low awareness of women about the realities of breast cancer (60% of women in this study were illiterate or had primary education, so they had low awareness about cancer and early detection, this was probably one of the main reasons for the low participation rate), unawareness of the importance and procedure of breast self-examination, social poverty, preoccupation and forgetfulness, fear of cancer diagnosis, lack of time for personal care, and fear and shame of examination (religious people) (Enzejab et al., 2004; Banaian et al., 2005; Soltan Ahmadi et al., 2010; Akbari et al 2013; Rezaei Ghazdehi et al., 2013).

In a study, Harris (2003) concluded that people who do not participate in breast cancer screening are mostly those who have less information on the benefits and importance of this action (Harris et al., 2001). Frank et al. (1999) found in their research that women with more obstacles for mammography participate less than other. These include pain, anxiety, fear of rays, and unnecessary of mammography in the absence of clinical signs of breast cancer and so on (Frank, 1999). Other studies suggested fear of pain during examination as an obstacle for mammography. In this regard, the role of healthcare providers in explaining the procedure of mammography and tolerability of the pain for patients is noteworthy (Mazloomi et al., 2006; Poole et al., 2008).

According to WHO, a participation rate of 70% is necessary for effectiveness of the program (Asadzadeh et al., 2011). Studies have shown that participation in a screening program may be influenced by factors such as socioeconomic status, awareness of prevention programs, invitation method, and distance from the screening center. If an epidemiological study can attract a large number of people for participation in a cancer screening program,

the program would be ideal for cancer research (Bonfill et al., 2001). In the present study, low education may be one of the reasons for low participation rate, since 95.13% of women in the villages and towns of a population of less than 20,000 and 84.93% of women in the urban region held diploma or under the diploma. The findings also showed that women's participation in mammography had a significant relationship with education at the level of 10% (0.07). Abedian Kasgary, et al (2006) showed that women with higher educational qualification are more likely to participate in screening programs. As another significant finding from this study, 182 women (47.9%) believed that breast self-examination is sufficient for finding mass, and mammography is not necessary. This belief can endanger the health of women with in the society, thus providing important information regarding the benefits and precision of mammography in early detection of breast cancer in comparison with breast self-examination (Abedian Kasgari et al., 2006). In some studies, the participation rate increased with increasing educational level (HL et al 2003; Lee, 2003; Ho et al., 2005; Mazloomi et al., 2006; Islam et al., 2006; Soltan Ahmadi et al., 2010). In a study by Soltan Ahmadi, et al (2010), women with associate degree had the highest and those with under diploma had the lowest participation rate. However, women with a bachelor's degree or higher showed a lower participation rate than women who held associate degrees (Soltan Ahmadi et al., 2010). In a study by Abu Samah (2012), More women who had undergone mammography were graduates from university or college, had full-time or part-time employment, were insured whether public or private, reported a positive family history of breast cancer, and were in the middle income level (Abu Samah & Ahmadian, 2012).

Invitation strategy may play an important role in achieving a high level of participation. This may have a negligible effect in our study, because the employed strategy in this program included extensive publicity, cooperation of health care centers and a recommendation of staff, recommendation of doctor, and in the urban region, door-to-door invitations; however, there is no information currently regarding what invitation strategy is more effective.

Enzejab et al. (2004) stated that the use of screening methods in the studied population was much less than expected, and that education was the most important factor regarding the reasons for referral, and given the mentioned obstacles and incentives, it was proposed to provide adequate education by healthcare workers (Enzejab et al., 2004). Kelikowske (2003) also stated that participation of women in breast cancer screening can increase by providing free mobile services to different parts of society (Kelikowske et al., 2003). In our study, the tests were freely performed for the eligible women, however, the participation rate was still low. providing more education about breast cancer and the benefits of screening for this disease is an essential first step (Montazeri et al., 2008). Educational programs that aim to change behavior by meeting women's existing beliefs rather than changing these beliefs might be an effective approach to increase screening practices (Truong et al.,

2013). Khalili et al. (2014) showed that people's decisions for performing breast cancer screening methods depend on their beliefs and attitudes. Change in people's attitudes towards performing breast cancer screening procedures may finally result in the participation of qualified women in breast cancer screening programs (Kalili et al., 2014). Knowledge and attitudes are relatively appropriate, but practical measures are not enough. Considering the HCP's role (health care providers) for implementing the national breast cancer control program, improvement in knowledge and attitudes is still important, but this may not be enough to reach to an appropriate level of desired practice (Harirchi et al., 2009).

Given the low participation of women in the screening programs, planners can investigate why people do not follow health advices regarding breast health. They can also determine the factors which affect people's decisions in the use of breast cancer screening methods; and hence an effective step can be taken toward maintaining and improving of women's health. It is of great importance to understand why patients in the community do not adopt preventive behaviors of the disease and do not observe healthcare. To improve the behavior of using health measures, one should not rely solely on education. Also, the obstacles should be noticed and removed. Women's health is the surest way to achieve a better life for all, and capacity-building and empowerment of women for participation in health programs is the key prerequisite for promotion of health and achieving family and community health goals.

In our study, extensive publicity was performed before the screening program at the desired places, necessary information about screening was provided to eligible women by physicians and health staff, the program had no cost to the participants, and health liaisons in the urban region conducted door-to-door and face-to-face trainings, however, the participation rate was still low.

Increasing awareness of women's health issues led to increased public health efforts for organizing activities, promotion of health, and prevention of disease in women at different levels. In the recent decades, a great number of programs and community activities throughout the world have been organized to provide preventive screening services. The main concern about breast cancer screening programs is the participation rate of women invited to the programs. Given the pivotal role of women in society and in strengthening families, making efforts for their health is essential for bringing about a healthy community. Higher awareness of women about breast cancer, and its risk factors and symptoms, as well as their familiarity with methods of early detection and screening programs, have a significant role in breast cancer prevention and early and timely detection of the illness.

As a limitation, this study did not get help from media, because the research was only performed in villages and towns a population of less than 20,000 covered by the family physicians of Kerman and the urban region excluding foreign nationals. Therefore, it was impossible to use media for raising awareness of the program. Distribution of villages and towns with a population of less than 20,000e made difficult to monitor the implementation

of screening program. When faced with an uninterested qualified woman, the researchers called a number of times and visited in the house, which had no significant impact.

In conclusion, results show that the participation of eligible women in breast cancer screening program is not optimal. Since participation of the target group is a prerequisite, and low participation rate is unfavorable for screening programs, it seems that as long as there is a risk of low participation of the target group, including breast cancer screening program in the health insurance package is not a right policy, because the cost-effectiveness of the program would be very low. Given the low participation of women in the screening programs, policy-makers and planners should identify the factors which affect people's decisions in the use of breast cancer screening methods, and thereby, an effective step can be taken toward maintaining and improving of women's health in the community. It is of great importance to understand why patients not adopt preventive behaviors and not observe healthcare. Women's health is the surest way to achieve a better life for all, and capacity-building and empowerment of women for participation in health programs is the key prerequisite for promotion of health and achieving family and community health goals. Obviously, the media, the operators of public education, and healthcare systems in particular, have a great responsibility in this regard, which will not be realized unless proper, long-term, and continuous programs are developed.

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