MINI-REVIEW

Breast Cancer Screening Among Females in Iran and Recommendations for Improved Practice: A Review

Giridhara R Babu[1]*, Goleen Samari[2], Sharon Phoebe Cohen[3], Tanmay Mahapatra[1], Randa May Wahbe[4], Sherin Mermash[2], Osman M Galal[2]

Abstract

Breast cancer is the second most common cancer amongst women, in Iran comprising 21.4% of female cancers. There are several screening modalities for breast cancer including breast self-examination, clinical breast examination and mammography. This research reviews the literature surrounding the implementation of these screening approaches in the Islamic Republic of Iran. After initial results produced approximately 208 articles, a total of 96 articles were included because they specifically addressed epidemiological characteristics of breast cancer, culture, religion, health seeking behavior, screening programs and the health system in Iran. Literature showed that breast self-examination and clinical breast examination were most common as there is no population-based mammography screening program in Iran. Additionally, most women appear to obtain information through the mass media. Results also indicate that Islamic beliefs and preventative medicine are very much aligned and can be used to promote breast cancer screening in Iran. These results highlight that there is a need for aggressive preventative measures focusing on breast self examination and gradually moving towards national mammography programs in Iran ideally disseminated through the media with government support.

Keywords: Breast cancer - screening recommendations - practice - Iran

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Introduction

Though breast cancer is the most prevalent cancer in the world, it has a better survival rate than other cancers(Sharif et al., 2010; Somi et al., 2008; Radmard et al., 2010; Parkin et al., 2005). Breast cancer is the most common cancer among women and second most common cancer overall, but it ranks fifth as a cause of death because of the relatively good prognosis(Parkin et al., 2001). It is reported that the incidence of breast cancer is increasing at the rate of 3-4% in developing countries(Parkin et al., 2001; GR Babu (2009a) ; Babu (2009b)). In Iran, breast cancer is the commonest cancer among women comprising 21.4% of all cancers among females (Noroozi et al., 2010). An analysis of the risk factors of breast cancer and preventive measures taken by Iranian women is important in understanding and addressing trends of the disease in Iran and subsequently implementing the proper population specific interventions. In the developing countries, the literature indicates that breast cancer presents about one decade earlier than in developed countries(Noroozi et al., 2010). A similar situation has been uncovered in Iran(Zavaheri et al., 2010). In younger women diagnosed with breast cancer, the disease has shown a more aggressive course and poorer prognosis(Zavaheri et al., 2010; Abanto et al., 2005; Montazeri et al., 2007). As a result, in Iran, the problem of breast cancer should be dealt with aggressive preventative measures. Early detection of breast cancer plays an important role in reducing mortality rates and improving patient prognosis; and delayed presentation of breast cancer is associated with lower survival, late-stage disease and high mortality rates (Lehman et al., 2005).

The recommended screening methods for early detection of breast cancer are mammography, clinical breast examination and breast self- examination. A large body of research has been devoted to evaluate the optimal screening method for breast cancer in developed countries. Nonetheless, there is a need for evaluating the unique role of culture, disease, behavior and religion in the successful implementation of a breast cancer screening program in a developing country like Iran. Our paper examines the literature surrounding the implementation of the three screening methods against the backdrop of the unique characteristics of the Islamic Republic of Iran.

Literature Search Strategy

Relevant papers reflecting the screening of breast cancer were used that identified the specific risk factors, screening methods, role of culture and religion, role of

*[1]Department of Epidemiology, [2]Department of Community Health Sciences, School of Public Health, [3]Islamic Studies, University of California Los Angeles, [4]Mailman School of Public Health, Columbia University, USA *For correspondence: giridhar.rb@iiphh.org*

public health system and most importantly, the type of screening method for breast cancer. We selected the papers from the following databases: CINAHL Plus (18 records, 2004-2009), Global Health (5 records, 1973-2009), Contemporary Women's Issues (11 records, 1995-2008), Family and Society Studies Worldwide (11 records), LexisNexis Academic (35 records), POPLINE (9 records), PubMed (105 records, 4 reviews), Women's Studies International (12 records). We excluded the searches from Factiva (1 record), Social Sciences Citation Index (3 records) and Web of Science, all of which indicated the same records.

Selection of records for review

The literature review identified several publications, approximately 208 records, in the field of clinical management and risk factors of breast cancer in Iran. Our team reviewed the title and abstract of all these papers. We included only those records, which addressed epidemiological features of breast cancer in Iran, role of culture, customs and religion in the health seeking profile, role of health system in implementation of new programs, and types of screening programs and methods most useful in Iran. We included a total of 96 records.

Epidemiology

The first population based cancer registry report on breast cancer in Iran found the age standardized incidence rate to be 16.2 per 100,000 person years during 1996-2000(WHO, 2009). The incidence of breast cancer has doubled in Iran during the last 30 years(Abanto et al., 2005; Abadi et al., 2003). According to a recent review (Montazeri et al., 2007), the incidence rate of breast cancer in women over 30 in Iran is 22 per 100,000, and the prevalence rate is 120 per 100,000. The authors of the population based cancer registry report found that the age adjusted incidence rates of breast cancer peaked among women aged 45-54 years(WHO, 2009). A majority of the breast cancer patients (63%) had advanced stage of the disease at the time of diagnosis and presented more often with a severe type of infiltrative ductal carcinoma(Montazeri et al., 2007; Marjani et al., 2009; Harirchi et al., 2010). Mortality from breast cancer ranges from 2.5 to 5.8 per 100,000 women in Iran, resulting in 7762 years of life lost in the 18 provinces of Iran in 2001(Montazeri et al., 2000). A high proportion of breast cancer patients in Iran present at least 10 years earlier than their counterparts in developed countries and often have advanced stage of disease at the time of diagnosis (Montazeri et al., 2000; 2002; 2007; Oran et al., 2004; Kashfi et al., 2002; WHO, 2002; Rezaei et al., 2003; Talei et al., 2004; Harirchi et al., 2008; Abbasi et al., 2010; Noroozi et al., 2010; Zavaheri et al., 2010). Reduction of family size and latter age at first birth for increasing proportion of women may play a role in increasing the incidence of breast cancer(Harirchi et al., 2008). One survival analysis of breast cancer patients of southern Iran demonstrated poor survival associated with late stage presentation and attributed the results to low awareness levels, lack of screening programs, and late access to treatments(Rezaianzadeh et al., 2009). Survival of patients with breast cancer has shown an increasing trend of survival with time during 1998-2005(Mousavi-Jerrahi et al., 2008). Another study concluded that the knowledge and attitude of Iranian health care providers were relatively appropriate for meeting WHO recommendations on early detection for breast cancer but practical measures were not sufficient(Harirchi et al., 2009).

The reproductive risk factors for breast cancer include early menarche, low parity, increased age at first pregnancy, late menopause and hormonal exposures(Abadi et al., 2003; Mahouri et al., 2007). Family history of breast cancer among first degree relatives and being never married are also found to be associated with increased risk of breast cancer(Mahouri et al., 2007). One study did show an association of having higher age at first pregnancy and abortion with increased risk of developing breast cancer. They also found that increased parity and duration of breast feeding were inversely associated with risk of developing breast cancer (Hajian-Tilaki and Kaveh-Ahangar., 2010). It is possible that several of these factors contribute to increased rates of breast cancer in Iran. Aging is considered the strongest risk factor for female breast cancer(Abadi et al., 2003). Unlike other epithelial cancers, the risk of female breast cancer increases rapidly until 50 years of age, followed by a more gradual rise (Abanto et al., 2005; Montazeri et al., 2007). The double peaks in age-specific rate are attributed by some studies to artifacts induced by calendar-period and/or birth cohorts (Lee et al., 1982; Parkin et al., 2001). while other studies have implicated genetic basis for such difference(Chatterjee et al., 2002; Anderson et al., 2003). It is possible that rate patterns correspond to the presence or absence of estrogen receptor (ER). The first peak in premenopausal women presents aggressively and is mostly caused by ER-negative status, and the second peak occurring in postmenopausal women is generally associated with less invasive ER-positive status (Kaltenbach et al., 1977; Lee et al., 1978; Ershler et al., 1994; Potter and Yasui., 1999; Perou et al., 2000; Chu and Tarone., 2002). Earlier incidence of breast cancer among Iranian females has been attributed to the interactions between hormonal and environmental factors(Somi et al., 2008). Body mass index and waist circumference were shown to predict breast cancer risk as bio-markers in both pre & post- menopausal females of Iran (Montazeri et al., 2008; Gholizadehpasha et al., 2010).

In their extensive review of the literature on breast cancer in Iran, Mousavi et al (2007) noted that the most common age of presentation of breast cancer in Iran was 40–49 years, with an alarming 30% of patients under 30 years. Studies reported that in developing countries, like Iran, locally advanced breast cancer is the most common presentation at initial examination(Harirchi et al., 2008; 2010; Montazeri et al., 2010). One study noted a downstaging trend in breast cancer in Iran(Harirchi et al., 2010). Another study detected a decrease in tumor size and downstaging of female breast cancer in Tehran, Iran (Montazeri et al., 2010). Authors of both the studies attributed these findings to the development of health system and increased health awareness among females

of Iran (Harirchi et al., 2010; Montazeri et al., 2010) There are not many studies regarding the presence of ER status in Iranian women. However, in a study involving 114 subjects in Tehran, it was found that 62.3% of breast cancers were ER-negative(Baanders-Vanhelewijn et al., 1960). A recent paper suggested that the IFN-γ T/T genotype could be a potential risk factor for breast cancer development in Iranian patients(Gransar et al., 2004). Another study identified Codon-392 CTC/CTG polymorphism to be associated with higher risk of familial breast cancer with lymph node metastasis(Abbasi., 2010). Some lifestyle related factors were found to modify the aberrant methylation drift of ERalpha and RARbeta2 genes in breast cancer patients(Abadi et al., 2010). Serum matrix metalloproteinase-9 was found to be a potential diagnostic marker for prediction of occurrence and progression of breast cancer(Motovali-Bashi et al., 2010). Novel human gene UBE2Q2 may have some implication for the pathogenesis of breast cancer and can be a potential diagnostic marker(Monabati et al., 2010). Methylation of HIC1 and RASSF1A promoters can be used as epi-genetic marker to diagnose malignant transformation of breast cancer in Iranian women(Monabati et al., 2009). CDC25A was found to have a possible prognostic value as a cell cycle marker for breast cancer and can be considered as a high risk characteristic(Sarafnejad et al., 2009). Interleukin-18 gene promoter polymorphism was found to have some association with breast cancer induction and progression(Ghiam et al., 2009). Presence of CCA haplotype of Interleukin-13 may be associated with breast cancer susceptibility among Iranian women (Razmkhah et al., 2009). The penetrance of BRCA1/2 gene mutations among Iranian females with breast cancer were estimated to be 31.9% in less than 50 years age group and 46.2% among 50 years or older age group(Hashemian et al., 2009). p16 INK4A promoter was found to be an epi-genetic factor that can predict sporadic breast cancer progression among Iranian patients (Frazmand et al., 2009).

Breast Cancer Screening Practices in Iran

There are three existing modalities of breast cancer screening: mammography, clinical breast examination (CBE), and breast self-examination (BSE). Of these three, only two are widely available to Iranian women: Currently, there are no population-based mammography screening programs in Iran. In the literature, this is attributed to the prohibitive cost of establishing a mammography screening program, which includes the expense of acquiring costly equipment as well as satisfying logistical and professional manpower requirements(montazeri et al., 2008; Harirchi et al., 2008). Therefore, BSE and CBE have been the mainstays of the Iranian breast cancer screening program.

Breast Self-Examination

Available descriptive studies suggest that the rate of BSE conducted by Iranian women living in Tehran is much lower than that of their Western counterparts. These studies used questionnaires and personal interviews to evaluate BSE behavior and attitudes. In a 1999 study where callers to a newly launched breast cancer information service in Iran were later interviewed, only 1% reported having started BSE(Montazeri et al., 1999). This is particularly remarkable given that these callers were self-selected in that they were seeking information about breast cancer. A 2002 study revealed that only 6% of a sample of 410 female health care workers reported that they performed BSE on a monthly basis, while 50% of respondents performed it occasionally, and the remaining 44% never performed BSE(Montazeri et al., 2003). This result was closely replicated in a 2002 sample of 708 teachers in Tehran, where 6% of women reported practicing BSE on a regular basis, 37% reported occasional practice, and 57% indicated that they never perform BSE(Kazemnejad et al., 2002). Another study in 2009 found that 31.7% of the participating 240 females had ever performed BSE and 7.1% of them had performed it at least monthly(Gregory et al., 2009). Meanwhile, in a study of 1402 women who were interviewed using a structured questionnaire, 17% of women said that they were conducting regular BSE, 20% reported occasional BSE, and 63% of women said that they never conduct BSE(Montazeri et al., 2008). In another study, authors found 46.7% participants did not perform BSE and most of those who did perform BSE used to do it incorrectly(Simi et al., 2009). It is notable that nearly three times as many women claimed to perform regular BSE in the last study as compared to the previous two. This may be because a trained female nurse administered the questionnaires to the study participants in person. Some women may have falsely reported regular BSE out of shame or fear that health care services would be revoked if they did not respond affirmatively.

Clinical Breast Examination

Meanwhile, there are no published data that estimate the percentage of Iranian women who schedule regular visits with their health care provider to discuss breast awareness and conduct CBE. This is probably at least partly because Iran lacks national breast cancer screening and education guidelines(Ghaemmaghami et al., 2005). A survey of Iranian women noted that among the factors that positively impacted access to health care services included women's insurance status, availability of affordable screening services and convenience, while cost, inadequate distribution of clinics and competing priorities at home were mentioned as barriers to access(Hydamia et al., 2007).

Factors Correlated with Breast Cancer Screening Practices in Iran

The research suggests that the factor that affects whether women perform BSE most is knowledge, both of the importance of BSE and of how to properly do it. One study found that the main reason women did not perform BSE was that they did not know how to do it (64%)(Montazeri et al., 2008). Jarvandi et al. concurred finding that among Iranian teachers, 34% of respondents cited lack of knowledge of how to do BSE as the main reason for not doing it (Montazeri et al., 2002). Conflicting evidence comes from the female health workers study, where 63% claimed that they knew how to examine their

breasts, and that BSE was neither difficult (63%) nor time-consuming (72%). This result is surprising, considering that only 6% of the respondents performed monthly BSE. The authors attributed this finding to lack of belief in the efficacy and utility of BSE. The results indicated that 46% of respondents believed that if they examined their own breasts they could not find abnormalities and about 54% said that if they knew the benefit of BSE, they would have done it(Kazemnejad et al, 2002). Studies have shown that perceived barriers and perceived self-efficacy can predict BSE behavior among females of Iran (Gregory et al., 2009; Noroozi et al., 2010).

Other factors that were frequently found to be positively associated with performance of BSE include age, level of education, occupation and perceived family income level. Cognitive factors are thought to play important role in the performance of BSE. The same studies differed on their findings with regard to correlating BSE with marital status, personal history of breast problems, and family history of breast problems (Bakr et al., 1999; Kazemnejad et al., 2002; Noroozi et al., 2010).

With respect to CBE, 58% of female health care workers in Tehran preferred to be examined by a female physician (Bakr et al., 1999). This is probably informed by the religious imperative for modesty and the belief that a man and a Muslim woman who are not related should not be alone together. However, almost half of women in the same study reported that CBE by a male physician is not against their Islamic beliefs. This result echoes the qualitative results found in the study of Muslim women in the U.S., where one woman said that if a female physician were not available, it would be permissible to be seen by a male provider (Hydamia et al., 2007).

Association of Religious Beliefs with Breast Cancer Screening Practices in Iran

Religious beliefs have a well-documented impact on health-seeking behavior in Iran, where 98% of the population identifies as Muslim. With respect to breast cancer screening, there are at least two competing normative frameworks within which Muslim women in Iran operate. The first is termed cancer fatalism, and it describes the belief that individuals do not have the ability to prevent, detect, or alter the course of the disease. One participant in a qualitative study of Muslim women in the U.S. describes it this way:

"One of the most prevalent beliefs among Muslim men and women is that our lives are in Allah's hands, and everything is from Allah and everything is caused by Him. When one of our sisters or brothers gets real sick… people often say 'this is God's will… whatever happens is Allah's will"(Bakr et al., 1999).

In a study the authors found that spirituality was the primary source of psychological support among participating breast cancer survivors (Montazeri et al., 2010). In one qualitative study of Iranian women, cancer fatalism was most commonly observed in women of low-educational status and housekeepers (Hydamia et al., 2007). The second common framework for relating health problems is to appeal to the divine command for humans to take responsibility for their own actions and therefore, for their own health. One woman in Tehran said: "We should go to the doctor because it is a divine responsibility based on the divine teaching that humans should act and only then the help of God will come."(Hydamia et al., 2007). In the only available quantitative study evaluating the direct impact of religion on BSE, 90% of female health care workers in Tehran reported that BSE is not inconsistent with their religious beliefs (Montazeri et al., 2008). The Farsi version of the Champion Health Belief Model Scale was found to have the potential to measure the beliefs associated with BSE and mammography among Iranian females (Taymoori and Berry., 2009).

How Women Obtain Information about Breast Cancer Screening

In 1997, the Iranian Center for Breast Cancer launched a breast cancer information service to disseminate information and advice about the disease, but in its first year of operation, the service received only about 1,000 calls nationwide (Montazeri et al., 2008). Other government programs have been introduced in Iran to increase breast cancer awareness and screening, such as educational programs for employed women and education workshops for female primary care physicians (Kazemnejad et al., 2002), but the truth is that most women get their information about breast cancer from the mass media. In one study, the majority of women who had heard about breast cancer screening programs indicated that television and radio were their main source of information (48%), followed by friends (20%) (Montazeri et al., 2008). In another study, networks of family and friends were determined to be an important source of encouragement to seek breast cancer screening (Montazeri et al., 1999).

Impact of Religion and State Services on Breast Cancer Screening in Iran

Islam and Health

Medicine and hygiene have been essential elements of the practice of Islam, dating back to the early years of Islam. However, at times, Muslims may avoid seeking medical attention because of cultural traditions rather than religious censure.

Islamic medicine is based on the precepts of the Qur'an and the prophetic hadiths (deeds and sayings of the Prophet Muhammad). The Prophet Muhammad established many traditional medical practices that were recorded in the hadiths and provide guidance for healing medicine and spiritual health(Harrison and Galal., 2004). This includes specific instruction for spiritual and psychological self-care and the encouragement of moderate eating, drinking, sleeping, physical activities, and sexual behavior.

Many Muslim physicians use Islamic health codes as well as incorporating the growing epistemology of medicine. The use of traditional healing beliefs of expatriate Muslims in the West supports the notion that religious healing systems can complement and support Western medicine(O'Connor., 1999).

In spite of the inclusion of modern health practices in the Middle East, public health programs throughout parts of the Muslim world do not adequately incorporate

enough Islamic reasoning to appeal to certain segments of the population.

More recently Muslim leaders have been arguing that God is the creator of all, and thus the creator of medical care and medicine justifying, the use of medicine and public health programs to treat disease like breast cancer. In Muslim societies like the Islamic Republic of Iran, gender also plays a big role in whether an individual seeks medical care, specifically, women who need medical attention are hesitant since most doctors are males. While there are some female physicians available to meet a portion of these needs, this should always be considered when formulating health programs in Iran.

Relevant Health Policies of the Islamic Republic

Although at times the Islamic Republic introduces policies that may seemingly limit women's rights, women's health is important to the regime. Recently, President Mahmoud Ahmedinejad introduced policy changes that curb women's legal rights with the 2008 Family Protection Bill(Family Protection Draft Bill. 2007). The Family Protection Bill has regressed women's rights in Iran by restricting their abilities to call for divorce and authorizing polygamy based on financial status. President Ahmedinejad has also called for an increase in birth rates, which contradicts the current policy of encouraging Iranian couples to only have two children and despite Iran's struggling economy.

In 1998, the Iranian Parliament adopted a law "to fully segregate the health care system for women and girls." This law has seriously compromised women's health because there are not enough trained female physicians and health care professionals to meet the needs of all the women and girls in Iran. The same law also emphasizes the prohibition on discussing women's issues or rights outside the interpretation of Shari'a (Islamic law). Women's rights can only be discussed by religious male figures in Iran."(Women's Forum Against Fundamentalism in Iran 2005).

The Iranian news media have been optimistic about government health programs. According to Iranian journalists, Iran has witnessed an increase in government sponsored preventive care programs targeting rural populations and universal health care coverage (Couper., 2004). Additionally, according to UNICEF, health status in Iran has improved in the last two decades (UNICEF., 2004).Breast cancer is a stigmatized topic in Iran, and this may contribute to the limited information regarding breast cancer. At least one study suggested that stigmatization prevented the screening and treatment of some types of cancer in Iran (Alamolhoda et al., 2008).

Iran's Public Health System

The WHO ranks Iran's health care performance at 58th and its health system performance at 93rd among the countries in the world. In 1985, Iran established a joint Ministry of Health and Medical Education that oversees the entire medical system, and according to the constitution, every Iranian is entitled to basic health care (Sayyarri et al., 2004). The merger ensured that the government would hold medical institutions accountable for providing the medical staff to meet the needs of the Iranian population (Lebaron and Schultz., 2005).

The health system has undergone many improvements since the Iranian Revolution in 1979 to keep up with the health care needs of the ever growing Iranian population. In 1984, Iran revised its health care system based on the 1978 Alma Ata declaration for primary health care for all(Government of Iran., 2009). The government began establishing a primary health care network, PHC. The aim of the PHC system is to reduce infant and child mortality, eliminate major childhood infectious diseases, and improving maternal health(Government of Iran., 2009). The current system also aimed to improve access for the disadvantaged, poor, and rural communities to health care, and the government's spending patterns emphasize rural public health services. In order to improve health access in poor, rural areas, the health system established "Health Houses", essentially community health centers staffed by locally recruited and trained community health workers(Hosseinpoor et al., 2007). A community health worker undergoes approximately two years of training. There are approximately 16,000 Health Houses throughout rural Iran that aim to meet the health care needs of 65,000 villages(Government of Iran, 2009). These community health worker service has improved many health outcomes; however, these rural "Health Houses" are not equipped to provide services for women like pap smears, breast exams, and contraceptive distribution(Sayyarri et al., 2004). The focus of the community health worker continues to be immunization of children, encouragement of breastfeeding, and treatment of diarrhea(Hosseinpoor et al., 2007). In more urban areas, there are Health Posts, which are essentially local clinics staffed with at least three general physicians and fifteen health workers. There are about 2,300 urban Health Posts to meet urban needs. Health Posts do have the means to provide women's services and some do so through female volunteers(Hosseinpoor et al., 2007). If a patient's health needs cannot be met at a Health House or a Health Post, that individual is referred to a general hospital to see a specialist. The health education system includes twenty four specialties and twenty one subspecialties, but majority of the physicians in Iran are general practitioners(Hosseinpoor et al., 2007). Iran, through its development of a primary care system and provision of clean water and sanitation, has reduced the burden of infectious diseases; however, the health care system is not fully equipped to handle the burden of chronic diseases, like cancer. Some community health workers have introduced health education and vaccination campaigns into their communities(Sayyarri et al., 2004). Many individuals who live in rural areas do not have access to health insurance; therefore, they only seek services when they become ill(Lebaron and Schultz., 2005). The PHC has created more access in rural areas where health services were previously unavailable, but Iran's system should be adapted for the growing burden of chronic diseases like cardiovascular disease and cancer.

Conclusions

The results from several epidemiological studies in

Iran suggest that the high prevalence of breast cancer might be caused by predominately early-onset and aggressive ER-negative breast cancers. Our literature review suggests that breast cancer affects younger Iranian women predominately in their fourth decade of life. Some studies also reveal that there are bimodal peaks affecting two distinct age groups (pre and post menopausal women). Further, the majority of breast cancers in Iranian women are either advanced and/or of infiltrative type at the time of presentation. Like in many developing countries, available information regarding incidence and prevalence of breast cancer may suffer from under reporting due to incomplete registration (Gouya et al., 2009).

Changing lifestyle patterns cause a high prevalence of overweight and obese and other well-known risk factors of breast cancer. Successful family planning programs have led many women to postpone having children, which may also contribute to the higher incidence of breast cancer in Iran. These unique epidemiological features of breast cancer pose challenges in the implementation of a screening program to detect and mitigate the burden of breast cancer in Iran.

Different studies have emphasized the importance of breast cancer screening programs (which include regular clinical breast examination and mammography), increasing public awareness about early detection of breast cancer and educating the health care providers about the disease and the screening program, in particular (Sadjadi et al., 2009). The studies reviewed in this article reveal that the proportion of Iranian women who conduct breast self-examination ranges from 3% to 17%, with the true rate probably on the lower end of this range. However, some authors have argued that there is no clear evidence to demonstrate the efficacy of routine BSE in early detection of breast cancer. Evidence from large-scale randomized control trials conducted in both Shanghai (Gao et al., 1997) and Russia (Bavli et al., 1992; Mikhailov et al., 1993) demonstrated that there is no difference between the intervention group conducting BSE and the control group in terms of stage of disease at detection or mortality, while there was a higher rate of benign biopsy results in the former group. A quasi-randomized controlled trial conducted in the UK also showed that BSE did not affect breast cancer mortality but did lead to a greater number of benign biopsy results (Lancet 1999). Based on these results, the Canadian Task Force on Preventive Health Care has recommended that physicians no longer teach BSE to women aged 40-69 because it can do more harm than good(Baxter., 2001). In addition to the cost, anxiety, and potential complications and scarring associated with unnecessary breast tissue biopsies, routine BSE was associated with more frequent physician visits. It is also important to consider that teaching and reinforcing BSE are costly activities that may divert from more efficacious preventive care strategies.

Nevertheless, BSE currently remains the screening tool of choice in developing countries because it is cheap, widely available, and does not require complex technical training. BSE can help in early detection resulting in early treatment and better prognosis. More importantly, BSE raises awareness of breast health among women. Training and practice of BSE promotes better knowledge, attitude and practice regarding health seeking behavior and having biopsies. The low rate of BSE found in Iran is consistent with the findings of other studies of women in developing countries,(Noroozi et al., 2010; Mikhail and Petro-Nustus, 2002; Hisham and Yip., 2003; Fitch et al., 1998; Fung 1998) while the rates of regular BSE in developed countries has been demonstrated to be much higher, with one study of Swedish adult women demonstrating a 70% compliance rate with monthly BSE guidelines(Ek et al., 1997). Studies revealed that a large number of patients can have early diagnosis and thus better treatment outcome if proper BSE training and efficient screening programs are offered to Iranian females(Harirchi et al., 2010). We suspect that even among women in developed countries, the self-reported rate of monthly BSE is greatly exaggerated. Studies conducted in the United States have reported widely divergent rates of regular BSE, from as low as 6% among female members of a health maintenance organization(Toobert et al., 2009) to as high as 80% among a population of American women seeking care at the Breast Health Center at Tulane University Medical Center(Madan et al., 2000). If the rate of regular BSE performed among women in developed countries is indeed low, then, this can be mitigated in part by women's access to mammography screening and CBE in developed countries, which is not widely available to women in developing countries. For this reason, regular BSE is probably more critical for early detection of breast cancer in countries like Iran.

The same factors that affect the low rates of BSE in Iran also impact patient delay in seeking care for breast cancer symptoms, which means that more women present with advanced-stage disease. Harirchi et al. found that lower income and less education are major risk factors for patient delay, as are lack of access to healthcare services, and lack of knowledge of breast cancer symptoms(Ghaemmaghami et al., 2005).

Recommendations

We recommend a two-pronged approach to the development of a breast cancer screening program in Iran. In the short term, a nation-wide campaign should be employed to raise breast cancer awareness and increase the rates of BSE. This effort will be spearheaded by the government of Iran through the use of the media to disseminate health information and the religious ministries to promote the message that preventive health care is a divine imperative along the lines of "God helps those who help themselves." This campaign will be coincident with the development of population-based screening and education guidelines. Routine screening guidelines are needed to give women a framework for promoting breast health. Health education interventions such as comprehensive community education, culturally sensitive health promotion efforts, and improved access to low-cost screening sites for women are essential to improving screening rates among these women. The rural Health Houses and urban Health Posts are ideally situated to carry out the screening and education program. The screening

guidelines could be integrated in the training already established for community health workers. Promotion of breast cancer screening through the established and effective Primary Health Care network seems like a logical next step in the promotion of primary care and prevention of chronic disease.

The studies reviewed above reveal that one of the most important reasons for the low rate of BSE in Iran is lack of knowledge of both the importance of BSE and of how to do it. The findings suggest that women need to be educated about breast cancer symptoms, especially the most frequent symptom, a non-tender breast mass. A qualitative study of delay among women reporting symptoms of breast cancer concluded that women need further information about breast cancer symptoms to assist symptom recognition as well as encouragement to seek medical advice if a symptom is ambiguous(Montazeri et al., 2003). Therefore, the dissemination of quality informat.ion about BSE delivered in an attractive and easily accessible way is of paramount importance in addressing the problem. Perhaps the most powerful and underutilized tool for disseminating information is the media, where in Iran it has been shown that this is the source most women use to derive their information about breast cancer. In developing countries, the mass media are willing to provide health care information free of charge(Montazeri et al., 1999). However, social values and moral considerations in Iran may limit the use of mass media for publicizing breast cancer awareness. Since the breast is regarded as part of the female sexual identity, speaking about the breast is taboo. This is a cultural custom rather than a religious restriction(Montazeri et al., 2003);therefore, enlisting the government as an active partner in the campaign to raise breast cancer awareness and disseminate screening guidelines is very important for the success of that campaign.

The impact of religion on health in a country that is governed by a theocratic bureaucracy and characterized by a monolithic religious identity cannot be overstated. In Iran, traditional cultural norms compete with more progressive Islamic dictates regarding preventive health care. Faith can be a facilitating factor in the pursuit of health care if health promotion messages are tailored to appeal to the adherents of the Muslim faith(Hydamia et al., 2007). Well-placed religious authorities promoting the message that 'God wishes people to take responsibility for their health' can blunt the prohibitive effect of cancer fatalism.

In the long term, the Ministry of Health should initiate studies to determine the feasibility and cost benefit of instituting a mammography screening program targeted to women 30-59 years of age. Previous studies have demonstrated that mammography screening is less than 20% effective in reducing mortality in women aged 40-49 years, while it is about 20-35% effective in women aged 50-69 years (Elmore and Fletcher, 2003). Mammography is the most sensitive technique currently available for the detection of nonpalpable breast cancer, and therefore, is the method of choice (Fung, 1998). One estimate is that mammography screening offered to women in this target age range will likely cost about 57 million USD, or about 0.7% of the total budget of the Ministry of Health(Toobert et al., 2009). Meanwhile, because of the relatively low age of presentation of women with breast cancer in Iran, it will be important to continue to promote a comprehensive program of BSE and CBE. Females with established risk factors for breast cancer should be identified carefully, and they must be specifically subjected to mammography (Hajian-Tilaki and Kaveh-Ahangar, 2010).

Further, more research has to be done in Iran to understand the prevalence, genetic epidemiology of ER-negative and ER-positive breast cancers in Iran. Our review does not address new imaging techniques that can be used in high-risk groups.

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