Cancer Screening Practice among Iranian Middle-aged Women

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A R T I C L E I N F O	A B S T R A C T
Article type: Original article *Article History:* Received: 31-Jul-2015 Accepted: 03-Aug-2016 *Key words:* Cancer Iran Middle-aged Screening Women	***Background & aim***: Breast, cervical, and colorectal cancers are the leading causes of mortality among women, the incidence rate of which has an upward trend with advancing age. Although cost-effective, easy, and available screening programs can help control these types of cancer in their early stages, it seems that cancer screening programs have not been implemented effectively. In this study, we investigated the rate of cancer screening practice in middle-aged women and explained the influential factors. ***Methods:*** This cross-sectional study with a sequential mixed method approach was conducted on 483 middle-age women selected through cluster random sampling in Yazd, Iran. Data were obtained by a research made questionnaire and analyzed with descriptive statistics and performing Pearson product-moment correlation, Student's t-test, and One-way ANOVA tests, using SPSS version 16. In the second phase of the study, qualitative, semi-structured interviews were performed and data were analyzed through content analysis. ***Results:*** The majority of the subjects had never been screened for cancer through mammogram (87.7%), Pap test (64.2%), or fecal occult blood test (FOBT) (89.8%). Educational level, employment status, perceived adequacy of income, perceived health status, and the number of children were significantly associated with breast and colon cancer screening practice. Qualitative data showed that lack of knowledge, the cost of screening exams, lack of financial independence, negligence of spouse, fear of cancer, embarrassment, and belief in destiny were the main reasons for non-adherence to cancer screening tests. In addition, knowledge and observing cancer in acquaintances and relatives were the main motivators of cancer screening. ***Conclusion:*** Middle-aged housewives, as well as women with low educational level and income were the most vulnerable groups, who did not adhere to cancer screening. Planning and management of cancer preventive programs and implementing educational programs on cancer screening for both women and their husbands are of great significance. Moreover, efficient health policies such as insurance payment should be considered by the government.

Introduction

Nowadays, the advent of technology, improvement of literacy and sanitation, development of antibiotics and vaccines, enhancement of living conditions, health care, and surveillance systems, sedentary lifestyle, as well as prevalence of obesity have changed perspective of illness and death worldwide, and non-communicable diseases are replaced with infectious diseases (1). Non-communicable diseases, mainly cardiovascular and chronic respiratory diseases, cancer, and diabetes, are the world's leading causes of mortality (2).

Cancer is a generic term for a large group of diseases that can affect any part of the body. Currently, cancer is one of the major reasons of morbidity and mortality. Annually more than 10 million new cases of cancer and more than 6 million deaths due to cancer occur around the globe (3).

By 2020, world population is estimated to be

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7.5 billion, 15 million of whom would suffer from cancer and 12 million of them would die of cancer (4-5). Despite the new treatment methods, cancer mortality rate is appraised to remain high (over 11 million) in 2030 (6). The most cases of death occur in the economically developing countries. At present, the third cause of mortality in Iran is cancer, and each year 30,000 people die of cancer in Iran (7).

Although the cause of all cancers is multiple mutations, most mutations are the result of interaction with the environment; therefore, more than half of cancers are preventable (5). Taking timely measures can prevent cancer incidence and mortality in numerous cases. Management and prevention of cancer have been reported as primary or secondary prevention. The chief goal of primary prevention is promoting awareness regarding carcinogenic agents, while in secondary prevention the objective is essentially set as cancer screening (8).

In the medical world today, cancer screening is important for reducing mortality and morbidity due to cancer. These methods are easy, cost-effective, and available and can result in reduction of cancer statistics and diminish the severity of cancer at diagnosis (2, 4).

Based on the GLOBOCAN 2012 estimates, breast, cervical, and colorectal cancers (CRC) are the most frequently diagnosed types of cancer and the most important causes of death due to cancer among female population (9). In developing countries, the maximum incidence rates of breast cancer occur within the 45-54 age group, while in developed countries, the highest incidence rates are observed in older ages (10).

Breast cancer is the most common type of cancer among Iranian women (9). An epidemiological review on breast cancer in Iran revealed that this type of cancer is most frequently observed in the 40-49 age group. Age of breast cancer in Iran is 10 years lower than in other nations. The incidence and prevalence rates of breast cancer in women were 22 and 120 per 100,000 cases, respectively, and 57% of the cases were diagnosed while in stage II (11).

According to the GLOBOCAN 2012, CRC is estimated to be a major cause of mortality due to cancer and the third most common type of cancer worldwide (9). Considering the latest evidence, screening tests can reduce mortality from CRC, and

guidelines from several major professional groups propose that anyone aged over 50 should receive regular screening for colorectal polyps and cancer. Although the current guidelines do not unanimously agree on the type and frequency of cancer screening for high-risk population, all emphasize on adherence to a regular screening program that includes annual fecal occult blood test (FOBT) (12-14). FOBT is a cheap and simple test recommended in national guidelines for CRC screening (15). Experts have estimated that with widespread adoption of screening practices, as many as 30,000 lives can be saved each year (14).

Cancer survival rate is lower in developing countries, which is most likely due to diagnosis in the late stages and limited access to timely and standard treatments. A significant portion of the worldwide burden of cancer might be reduced through the use of existing knowledge on cancer management and implementation of cancer screening programs (16).

Although cervical cancer is the 12th most common type of cancer among Iranian female population, it has high mortality rates due to advanced stage diagnosis; this disease accounts for almost 2% of female cancer deaths (9).

Based on studies performed in Iran and Asia, a large number of women never receive screening for cancer (e.g., breast, cervix, or colorectal) or do not adhere to regular screening due to various reasons (17-20). Regular screening for these types of cancer might remarkably diminish mortality rates. Several studies have separately examined cancer screening for all types of cancer among Iranian women (18, 20-22). Given the high risk of breast, cervix, and colorectal cancers with advancing age, in this study, we aimed to evaluate cancer screening behavior among middle-aged women in Yazd, Iran. Moreover, we compared the characteristics of women performing regular screening with those who never received any screening test and identified the main obstacles and motivators of cancer screening practice.

Materials and Methods

Using a sequential mixed method approach, this cross-sectional study was performed during spring 2010 on middle-age women in Yazd, Iran. To select the participants, cluster random sampling method was applied. In the beginning, 500 middle-age women were selected from 10

chosen areas of Yazd (50 participants from each area). In general, 15 of the subjects rejected to participate and two questionnaires were not filled-out completely. Ultimately, 483 women were recruited in the study.

Questionnaires were distributed and the interviews were conducted by the researcher. Due to low level education of participants, the questionnaires were completed via personal interviews. The inclusion criteria comprised of being aged 40-60 years, voluntary participation, and no previous history of breast, cervical, or colorectal cancer.

In the current study, data were collected using a self-designed questionnaire, which was validated by a panel of experts. The reliability of the questionnaire was confirmed using Cron-bach's alpha (α=0.85). The questionnaire includes predisposing factors such as age, educational level, marital status, occupation, number of children, weight, height, perceived health status-related factors including health insurance status, perceived adequacy of income, and history of cancer screening. Perceived health status and perceived adequacy of income were evaluated based on self report (1= weak, 2= intermediate, and 3= good or enough).

History of cancer screening for breast cancer (i.e., monthly breast self examination [BSE], annual clinical breast exam [CBE], and annual mammogram), cervical cancer (Pap test, first annually for three years and then every three years), and colorectal cancer (annual fecal occult blood tests [FOBT]) was based on self report; the questionnaire was rated using regular=3, irregular=2, and never=1. Body mass index (BMI) was calculated, as well.

To identify the screening behavior determinants, the qualitative part was performed. Semi-structured interviews were conducted with 21 women chosen through purposeful sampling. Suitable candidates were selected and contacted via telephone calls, and the aim of the study was explained and time and place were arranged with them.

The scientific research committee of Yazd University of Medical Sciences approved the study (1184). The ethical procedures of the study assured confidentiality of the data. All the participants were informed of the purposes of the study, and informed consent was obtained from them. Immersion in research, member check, and the peer reviewing were used to rigor of data analysis.

For data analysis, descriptive statistics including frequency, percentile, and mean were used. Spearman product-moment correlation test, Chi-squared, and One-way ANOVA tests were performed to evaluated associations between demographic factors and cancer screening practice, using SPSS version 10. P-value less than 0.05 was considered statistically significant. Qualitative data was analyzed manually by content analysis.

Results

The demographic characteristics of the participants (n=483) are presented in Table 1.

Table 1. Demographic characteristics of the participants (n=483)

Variables	Indices
Age*	48.51±6.04, 40-60
Educational level *	6.74±4.88, 0-22
Illiterate (n, %)	(69, 14.3%)
Primary (n, %)	(287, 59.4%)
Diploma (n, %)	(76, 15.7%)
Academic (n, %)	(51, 10.6%)
Number of children *	4.02±1.93, 0-12
Weight *	71.41±10.55, 40.5-108
Body mass index *	28.32±4.40, 14.52-43.82
Marital status	
Married (n, %)	(449, 93%)
Single (n, %)	(34, 7%)
Employment	
Employee (n, %)	(40, 8.3%)
Housewife (n, %)	(411, 85.1%)
Retired (n, %)	(32, 6.6%)
Menopausal status	
Yes (n, %)	(183, 37.9%)
No (n,%)	(300, 72.1%)
Health insurance coverage	
Yes (n, %)	(452, 93.6%)
No (n, %)	(31, 6.4%)
Perceived adequacy of income	
Weak (n, %)	(69, 14.3%)
Intermediate (n, %)	(282, 58.4%)
Enough (n, %)	(132, 27.3%)
Perceived health status	
Weak (n, %)	(35, 7.2%)
Intermediate (n, %)	(258, 53.4%)
Well (n, %)	(190, 39.4%)

*(Mean±SD, range)

The mean age of the subjects was 48.51±6 years (age range: 40-60 years), most of whom (93%) were married, and about one-third of them had less than high school education; 25% of the subjects had high school diploma or an academic degree. In general, only 27% of the subjects expressed adequate income and 8.3% were working full-time. The majority of the participants (93.6%) reported having health insurance.

Regarding cancer screening history, the majority of the samples (64%, 67.3%, and 87.7%) had never been screened for breast cancer by BSE, CBE, and mammogram, respectively. Only 4.3% of the participants received annual mammogram and 11% monthly BSE. Moreover, 8.3% of the participants performed regular Pap test and 64.2% of them did not have history of Pap test. FOBT was performed in 1% of women and 89.8% of them did not have history of this test and had never heard about it (Figure 1).

The data were analyzed to identify any significant associations between cancer screening behavior and correlating factors. Pearson product-moment correlation test reflected a positive significant correlation between cancer screening

and educational level (P<0.001) and a negative significant correlation between the number of children and FOBT (P<0.006; Table 2).

Chi-squared test demonstrated a significant relationship between cancer screening practice (except for FOBT) and perceived adequacy of income (P<0.05). According to ANOVA, there was a significant link between cancer screening practice and occupation and educational level, as screening practice was more commonly observed among retired women than those who were housewives or employees. Table 2 exhibits the study findings.

In the qualitative part of the study, the data were obtained from semi-structured interviews with 21 participants, who had never received screening cancer procedures on a regular basis. Sampling was tried to have maximum diversity. Six participants in this study were in menopausal and 15 were in postmenopausal periods. In terms of educational level, 10 participants had primary, eight high school or diploma, and three academic education. In addition, 16 participants were housewives, four employees, and one retired.
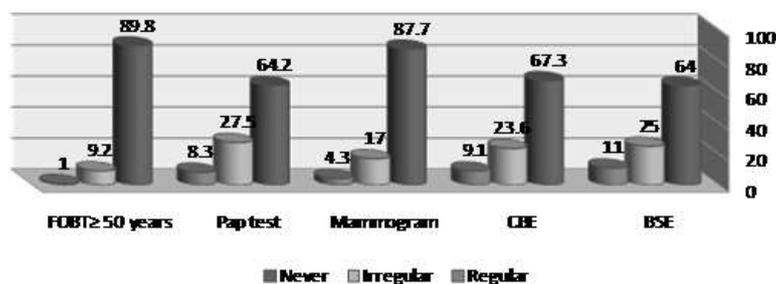

Figure 1. Frequency distribution of participants by screening programs

Table 2. States of cancer screening with demographic characteristics

	Age	Marital status	N of children	Educational level	Employment status*	Health insurance coverage	Perceived adequacy of income	Menopausal status	Perceived health status	Body mass index
BSE	P=0.565	P=0.550	r=-0.173 P=0.000	r=0.299 P=0.000	χ2=19.4 P=0.001	P=0.173	χ2=11.29 P=0.024	P=0.542	P=0.590	P=0.784
CBE	P=0.092	P=0.647	r =-0.124 P=0.006	r=0.240 P=0.000	χ2= 13.44 P=0.009	P=0.098	χ2= 17.80 P=0.001	P=0.824	χ2= 21.61 P=0.000	P=0.478
Mammogram	r=0.103 P=0.023	P=0.159	r=-0.156 P=0.001	r=0.242 P=0.000	χ2= 22.14 P=0.000	P=0.196	χ2= 17 P=0.002	P=0.092	χ2= 13.29 P=0.010	P=0.591
Pap test	r=-0.119 P=0.009	P=0.196	r=-0.124 P=0.006	r=0.161 P=0.000	P=0.746	P=0.06	χ2=17.75 P=0.001	χ2= 14.88 P=0.001	χ2= 10.31 P=0.036	P=0.178
FOBT	r=0.123 P=0.007	P=0.871	P=0.096	r=0.146 P=0.001	χ2= 18.80 P=0.001	P=0.089	P=0.721	χ2= 11.66 P=0.003	P=0.561	P=0.775

Note. Widowed, single, and divorced were assigned to the a non-married group due to low cell counts.
* Retirees have difference with Housewives & Employees

Directed content analysis was carried out, and codes were extracted after analyzing each interview. After summarizing and comparing the data, these codes were classified considering their similarity. The codes were sited under subcategories of the main theme of obstacles and motivators for cancer screening. Seven main obstacles and two major motivators for cancer screening were found among the middle-aged women. The obstacles were lack of knowledge, cost of screening examination, lack of financial independence, negligence of spouse, fear of cancer, embarrassment, and belief in destiny. The major motivators of cancer screening were knowledge and observation of cancer among acquaintances and relatives.

Discussion

The purpose of this study was to investigate screening behavior among middle-aged women and identify its determinants. Despite the fact that advancing age is an important risk factor for breast, cervical, and colorectal cancers, screening rates in these women were very low.

Women should undergo monthly BSE after 20 years and CBE every three years between the ages of 20 and 39 years, and annually after the age of 40 (24), but 64% of the participants in this study had never performed BSE and 67.3% were never examined clinically. Thus, implement-tation of training programs must be integrated into primary health system in developing countries to promote awareness regarding breast health, breast self-examination, and clinical breast examination (23).

Mammography is established as the most appropriate technique for breast cancer diagnosis (25). American Cancer Society Guide-line recommended that annual mammography should be performed at the age 40 (12); however, only 4.3% of our participants perfor-med regular mammography and 87.7% of them had never received mammography.

In a study conducted in Saudi Arabia, 67.6% of participants had never conducted BSE (26), and in a study performed in Pakistan, only 28.3% and 12.7% of women had practiced BSE and CBE, respectively (27). In Korea, 30.4% of women aged at least 40 years had received breast cancer screening with mammogram at least within two years before the study (27). A study carried out on

Turkish teachers showed that 43.9% had conducted breast self-examination; yet only 10.5% of them did it on a monthly basis. Only 22.3% of the teachers reported having at least one clinical breast-examination

Herein, among the 136 women aged over 40 years, only 37.5% had at least one mammogram (28). Evaluation of breast cancer screening rate in Yazd, Iran, among women with the mean age of 30 years in 2004 showed that 80% of participants had never performed CBE (29). That study also demonstrated that over seven years, despite the high incidence rate of breast cancer in Yazd, breast cancer screening rate did not increase. The screening rates in developed countries, even in minority and immigrant communities, are much higher than in Asian countries. A study on Asian immigrant women in Canada showed that 60% of Asian immigrant women reported recent mammogram use; however, this rate was 72% in non-immigrant women (30).

Sim et al. in a study on breast cancer screening practice among Singaporean women revealed that 53% performed regular BSE and 57% of women aged over 40 years received mammogram. According to former studies, Singapore is the only country in Asia that has a national breast cancer screening program (31).

Although Iran's Ministry of Health and Medical Education recommends annual Pap smear for three years and with negative response, it is suggested to be performed every three years until the age of 65 (32), 64.2% of the participants had never performed Pap test. This rate of involvement in cervical cancer screening is far less than the goals recognized in Healthy People 2010, which proposed that 97% of women should have had at least one Pap test in their lifetime and 90% should have been screened within the past three years (33). According to the American Cancer Society, inadequate level of screening appoints these women at risk for developing invasive cervical cancer (ICC) (34).

Deker et al. in a study of Papanicolaou test utilization and frequency of screening oppor-tunities among women diagnosed with cervical cancer, found that 46% of women with ICC and 67% of the control group had received one Pap test during five years before the cases' diagnosis, and after adjustment for age, income, and

residence, the rate of Pap testing was significantly higher in the control group (35). Hatcher et al. also investigated cervical cancer screening among rural Appalachian women (36). They found that 33% of the women had not performed Pap test during the past five years, and 1% had never received this test during their life. Wang et al. in comparison of cervical cancer screening rate between Asian-American and Non-Hispanic white women found that Asian-American women had a lower rate of recent Pap test (70%) than non-Hispanic white women (81%) (37).

For CRC, screening options are chosen based on individual risk, personal preference, and access, but the most appropriate and most cost-effective method in Asia is to start CRC screening at the age of 50 with annual high-sensitivity FOBT (38-39). In the present study, 9.2% (21 out of 206) of women aged over 50 years had history of at least one FOBT for CRC screening and only 1% (2 cases) received annual FOBT. CRC is a major cause of mortality, and it is the third and fourth cause of death from cancer in the world and Iran for women, respectively (9). With early diagnosis of CRC, lives of over 90% of people with the disease will be elongated for more than five years after diagnosis. Unfortunately, the rate of early diagnosis of CRC is low (40). A study in Canada (British Columbia) demonstrated that FOBT screening rate was 7.7% in the year before and 78.4% never received FOBT (41).

Data from the National Health Interview Survey (1992) in America revealed that 26% of the population aged over 50 years reported FOBT within the past three years, while the objectives set in Healthy People 2000 are for 50% of the population aged over 50 years to report FOBT within the past two years (42). CRC screening is not common in Asian countries (43). Pourhoseingholi (44) et al. in review of years of life lost because of CRC in Iran stated that the rate of CRC screening in Iran is low and recommended that screening should be started in Iran, at least in high risk people, to reduce the mortality rate.

Reiter and Linnan (45) in examination of cancer screening behaviors of African-American women showed that 94% (1026 of 1089) of women aged ≥18 years reported receiving a Pap smear test within the last three years, 70% (298 of 425) of women aged over 40 years reported receiving a mammogram within the last year, and

64% (116 of 180) of women aged ≥ 50 years were considered to meet the criteria put forth by guidelines for CRC.

The data from the present study indicated poor breast, cervical, and colorectal cancer screening behavior among Iranian women aged ≥ 40 years. In addition, we found that age, low educational level, number of children, employment status, perceived adequacy of income, and perceived health status were associated with non-adherence with cancer screening programs, while advanced age was only associated with mammogram and not with BSE and CBE.

In this study, women with lower educational levels and greater number of children had lower rates of cancer screening for breast and cervical cancers. Other studies carried out on Iranian women also indicated association of screening behavior with advanced age (46). Advanced age is broadly known as a risk factor for breast cancer, and the significance of breast and colorectal cancer screening in the middle-aged and elderly women has been distinguished for many years. A study performed in Korea on women aged ≥ 40 years exhibited the relationship between breast cancer screening and age, educational level, monthly income, physical health insurance, marital status, and self-reported health status (47).

Ample studies have established that personal characteristics, such as income and education, increase the probability of screening for cancer (42, 48-51). Results showed that retired participants were different from housewives and employees in cancer screening options. This might be owing to the fact that the majority of retired women in this study were teachers, and thus, had a higher educational level than others.

Despite other studies (47, 50), in this study, health insurance coverage was not associated with cancer screening rate, which might be due to the fact that share of payments is high by the insured in insurance system in Iran and as a result, those with a health insurance coverage have not very different with others for payments of cancer screening tests.

In several studies, for each of the three cancer screening modalities, lack of knowledge, cost, fear of cancer, and embarrassment were the main barriers of cancer screening, which is consistent

with the results of our study (17-20, 22). Financial dependence, negligence of spouse, and belief in destiny were other barriers for cancer screening in the present study. Also, knowledge and observation of cancer among acquaintances and relatives were the strongest motivators of cancer screening. To prevent cancer among women, interventions should focus on raising awareness, and the authorities and health educators should be aware of the influences of the traditional culture on the health of middle-aged women (52). The strength of this study is its mixed method approach for investigation of the rate of screening and its related factors, and its main limitation is that the results of the qualitative phase are not generalizable.

Conclusion

Low rates of cancer screening in middle-aged housewives with low educational level and income demonstrates the need for planning and management of cancer preventive programs for training women and their husbands. In addition, further studies should be performed to address the barriers and motivators of cancer screening practice. Understanding demographic characteristics associated with screening tests can provide deeper insight into this problem.

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Conflicts of Interest

The authors declare no conflicts of interest.

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