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Survey of Breast Self-Exam and Mammography Compliance among Female Healthcare Workers in Aq Qala City, Iran

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Abstract

Background: Breast cancer is the most common cancer among women. The objective of this study was to determine the breast self-examination (BSE) and mammography compliance based on health belief model constructs among female healthcare workers in the city of Aq Qala.

Methods: We conducted this cross-sectional study between November 2015 and February 2016 in Aq Qala city, northern Iran. In this regard, we selected 261 female healthcare workers through census. Data were gathered using Rakowski's stages of change and Champion health belief model scale. We entered the collected data into SPSS 16 and analyzed them via descriptive statistical techniques along with Kruskal-Wallis, Mann-Whitney, chi-square, and Spearman rank correlation coefficient.

Results: The results showed that 26.4 % of the participants performed regular BSE and 19.3% underwent regular mammogram. Those with regular BSE had significantly more health motivation and self-efficacy ($P \leq 0.05$). Physicians had more susceptibility and self-efficacy for BSE and less BSE barriers ($P \leq 0.05$). There was a negative correlation between BSE confidence and barriers (r=-0.376). The results of binary logistic regression revealed that confidence was the only variable influencing BSE (OR=1.77, 95% CI=1.22, 2.572).

Conclusion: Almost one-fourth of female healthcare workers of Aq Qala performed regular BSE. Moreover, one-fifth of women over 40 years of age underwent regular mammograms. Participants who performed regular BSE had higher health motivation, BSE self-efficacy, and lower perceived barriers. BSE adherence was more in physicians than in other groups. We recommend increasing confidence to surmount the barriers to perform BSE.

Keywords: Breast neoplasms, Breast self-examination, Mammography, Early detection of cancer

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Introduction

The age standardized rate for breast cancer in 2012 was 33.21 per 100,000, while the age-standardized rate for mortality is 14.2 per 100,000 with a mean age of 49.84 years. Based on GLOBOCAN report in 2014, the incidence rate of breast cancer in Iran was 24.5 %. Additionally, based on Iranian reports, there were 9795 women diagnosed with breast cancer.[1] The results showed that 57.6% of breast cancer cases in Iran were women under 50 years of age. Besides, the mean age for breast cancer in Iran was five years earlier in Iranian women compared to the developed countries.[2,3]

Since the factors contributing to breast cancer are still not very clear, reduction in mortality and morbidity depends on secondary prevention and early diagnosis.[4] Global cancer statistics revealed that the paucity of diagnostic and screening programs and treatment facilities more heavily ensued the low survival rate of cancer in under-developed and developing countries.[5]

Screening is among the most optimal approaches to early diagnosis. With proper screening, breast cancer characteristics, such as slow growth, are detectable at early stages. Moreover, treatments are more effective in the early stages of the disease, further signifying the importance of screening.[6]

Breast self-examination (BSE) can be performed by any woman at any age. This examination is free, takes only 15 minutes, and is to be performed only once a month. With monthly breast examination, the individual becomes familiar with breast tissue characteristics. This enables them to detect any changes in the early stages.[6]

The Ministry of Health also recommends that women aged 40 and older undergo annual mammography.[7] Mammography is highly effective in the early detection of tumors and reduces the mortality rate; however, compliance with and performance of mammography is very poor in Iran.[8,9]

Behavioral theories can be conducive for evaluating screening behaviors. One such theory is the Transtheoretical Model of Health Behavior Change first introduced in the early 1980s by Prochaska and his colleagues. According to this model, a behavior changes through passing a series of specific steps.[10] Rakowski et al. were the first to use this model for breast cancer screening behaviors.[10] Based on this model, changes in breast cancer screening behavior comprises five mammography stages:

1. precontemplation (the subject has no mammogram history and is not willing to have a mammography done in the next couple of years).

2. Contemplation stage (there is no history of mammography, but the subject is planning to do it within the next one or two years).

3. Action (a mammography is done according to a scheduled plan and there is willing to continue the program).

4. Maintenance (the person has undergone mammography at least twice and is planning to have at least once more).

5. Relapse stage (the subject has had mammography at least once; however, she has currently stopped the program and is not planning to have another mammography in the next one or two years).[11]

When it comes to adopting healthy behaviors, healthcare workers are important role models in a community. However, only a few studies have examined breast cancer screening acceptance behavior among healthcare workers in Iran.[12,13] On the other hand, most studies in this area have not considered the theoretical and psychological aspects of breast cancer screening. Furthermore, health beliefs and their relationship with breast examination and mammography among healthcare workers have not been investigated at all. This study aimed to specify BSE and mammography compliance based on health belief model constructs among female healthcare workers of Aq Qala, Iran.

Methods

This cross-sectional descriptive-analytical study was performed between November 2015 and February 2016 in Aq Qala city, northern Iran. Participants included all healthcare workers, (doctors, nurses, midwives, public health experts,

Table 1. Kruskal-Wallis test results, the mean, and standard deviation of the constructs of health belief model in various stages of BSE

Health Belief Model Constructs	Pre-contemplation N=58	Contemplation N=128	Action N=40	Maintenance N=29	Relapse N=6	*P*-value
Perceived susceptibility	2.56±1.13	2.91±1.24	2.91±0.90	2.85±1.16	2.55±1.10	0.364
Percieved Severity	3.50±0.73	3.74±0.79	3.70±0.74	3.62±0.84	3.52±0.57.	0.489
Percieved Benefits	3.85±0.72	4.21±0.59	4.13±0.66	4.25±0.64	4.30±0.53.	0.020
Percieved Barriers	2.33±0.64	2.27±0.76	2.07±0.78	1.95±0.79	1.62±0.42.	0.003
Self-efficacy	2.96±1.07	3.20±1.16	3.74±1.02	4.02±1.06	3.28±1.04.	0.001
Health Motivation	3.61±0.71	3.94±0.62	4.20±0.71	4.20±0.55	4.04±0.59.	0.001

BSE: Breast self-examination

environment professionals, laboratory personnel, community health workers, and administrative staff) employed by the city of Aq Qala health and treatment network. We excluded women working in the service sector and enrolled participants through census. We also limited the study population to 280 individuals, of which 19 did not complete the questionnaires; therefore, the questionnaires were completed by 261 participants.

Women under 40 years of age completed BSE and health motivation questionnaires; however, they did not complete the mammography questionnaire. Women over 40 years of age completed the mammography questionnaire, as well.

We collected data using the following questionnaires:

1. Questionnaire of demographic variables, including age, occupation, marital status, and family history of breast cancer.

2. The Champion Health Belief Model Scale (CHBMS), a measurement tool for assessing individuals' beliefs in breast cancer screening methods. This questionnaire is based on the Health Belief Model structures and variables that were introduced in the 1980s by Champion,[14] and have since been widely used by researchers. Based on this model, when a woman realizes she is running the risk of breast cancer (perceived susceptibility) and considers it a serious illness (perceived severity), then, she acknowledges the benefits of breast cancer screening (perceived benefits) against its barriers (perceived barriers) and aims to overcome these barriers. Only then, she is likely to follow the screening methods.[15] However, CHBMS includes two parts, namely BSE and mammography.

The BSE section of the questionnaire consists of 35 questions in six areas of perceived susceptibility (three questions), perceived severity (seven questions), perceived benefits (six questions), perceived barriers (nine questions), and perceived self-efficacy for BSE (10 questions).[15]

We evaluated the questions regarding perceived susceptibility, severity, benefits, and barriers based on the 5-point Likert scale (strongly agree, agree, do not know, disagree, and strongly disagree). Participants had to select one of the five options as their response, with their scores ranging from 5 to 1, respectively. We assessed the questions of self-efficacy using a 5-point scale, and the responses ranged from "do not know at all" (with the score of 1) to "am completely aware of" (with the score of 5). The results indicated that the health belief model's prediction of the frequency of BSE was equal to 0.51.[16] Champion reported that the reliability using Cronbach's alphas ranged from 0.73 to 0.94.[17] Cronbach alpha reliability coefficients for the revised scales varied from 0.80 to 0.93. Test–retest correlations ranged from 0.45 to 0.70.[15]

The mammography section included questions regarding mammography perceived benefits (six questions), perceived barriers (10 questions), and self-efficacy (four questions). Scale and scoring of this section was the same as that of the BSE section. Instruction for action was assessed with two questions regarding the history of breast cancer among first-degree relatives and close friends. The health motivation, sensitivity, and severity questions were similar in both sections. The validity and reliability of this questionnaire in Iran have been previously examined and approved.[18] Besides, this scale was validated

Table 2. Mann-Whitney test results; the mean and standard deviation of the health belief model constructs in participants who regularly practiced BSE and in those who did not take proper action

Health Belief Model Constructs	BSE Performers N=69	BSE Non Performers N=192	Z-score	*P*-Value
Perceived Susceptibility	2.87±1.01	2.80±1.21	-0.472	0.673
Perceived Severity	3.65±0.78	3.67±.7	-0.029	0.793
Perceived Benefits	4.21±.62	4.10±.65	-0.916	0.220
Perceived Barriers	1.99±.78	2.27±.73	-3.292	0.008
Self-efficacy	3.89±1.02	3.13±1.13	-4.865	0.001
Health Motivation	4.23±.58	3.83±.68	-4.125	0.001

BSE: Breast self-exam

among Iranian women with family history of breast cancer by Hashemian et al.[19] However, Champion reported that the internal consistency of the revised version of mammography screening scale ranged from 0.75 to 0.88 and the test reliability varied from 0.59 to 0.72.[20]

In addition, the subjects' health motivations were assessed via seven questions.[15] Health motivation questions were measured using a 5-point scale, with the responses varying from "never" (with the score of 1) to "always" (with the score of 5).

3. The Mammography Processes of Change Scale evaluates the stages of change.[11] Rakowski stages of change questionnaire are comprised of five questions regarding the stages of changes on BSE and five questions regarding mammography. Based on this questionnaire, each stage of change in breast cancer screening behavior is categorized into one of the following stages: precontemplation, contemplation, action, maintenance, and relapse. This questionnaire has been previously employed in Iran by Moodi et al.[21] and Taymoori and Berry.[22]

The Ethics Committee of the Golestan University of Medical Sciences approved the study protocol (IR. Goums.REC.2796289 3111929). We collected the data using questionnaires and in the presence of a public health expert and a senior expert. Prior to the study, participants were briefed about the study protocol and objectives. We further obtained the confidentiality and anonymity of the collected data and their oral consent.

We entered the collected data into SPSS version 16. Statistical tests, such as frequency distribution, mean, standard deviation, T-test, Mann-Whitney, chi-square, and Pearson correlation coefficient were used for data analysis. We considered the participants in the action and maintenance stages as regular performers of BSE. A *P*-value of less than 0.05 was statistically significant.

Results

Participants aged 21-49 years (mean±SD= 32± 6 years). Among all the participants, 199 (76%) were married, 27.1% were community health workers, and 20.6% were nurses. The preponderance of participants did not mention any history of breast cancer among their relatives (85.8%).

The distribution of the stages of change in BSE showed that 58 subjects (22.5%) were in precontemplation, 128 (48.8%) in the contemplation, 40 (15.3%) in action, 29 (11.1%) in maintenance, and 6(2.3%) in the relapse stage. Of 261 studied women, 31 were over 40 years of age and were evaluated in terms of mammography performing distribution. Results showed that four people (12.9%) were in precontemplation stage, 21 individuals (67.8%) were in the contemplation stage, five subjects (16.1%) were in the action stage, and 1(3.2%) person was in the maintenance stage.

Kruskal-Wallis test results showed a significant difference between the stages of performing BSE and structures of health belief model. Perceived susceptibility, severity, and benefits increased irregularly as the stages proceeded; however, the structures of self-efficacy and health motivation showed a linear increase. The perceived barriers structure showed a linear decrease as the stages proceeded (Table 1).

Mann-Whitney test results showed that the

Table 3. Kruskal-Wallis test results, the mean, and SD of the health belief model constructs regarding BSE among different occupational groups

Health Belief Model Constructs	Physicians N=15	Nurses N=54	Midwives N=39	Public Health N=10	Environmental Health N=13	Family Health N=11	Laboratory Personnel N=10	Community Health Workers N=71	Administrative Staff N=38	*P*-value
Perceived Susceptibility	3.40±0.95	2.65±1.12	2.88±1.21	3.13±0.99	2.53±1.26	3.30±1.11	2.86±1.04	2.87±1.19	2.50±1.17	0.208
Perceived Severity	3.01±0.57	3.51±0.81	3.56±0.79	3.74±0.50	4.09±0.72	3.48±0.60	3.55±0.79	3.91±0.77	3.69±0.62	0.001
Perceived Benefits	4.01±0.65	3.98±0.63	4.20±0.62	4.08±0.47	4.08±0.69	3.95±0.71	3.98±0.54	4.35±0.55	4.01±0.81	0.001
Perceived Barriers	1.75±0.54	2.28±0.59	1.78±0.77	1.97±0.50	2.67±1.06	2.46±0.66	2.52±0.56	2.20±0.82	2.44±0.61	0.033
Self-efficacy	4.27±0.82	2.85±0.86	4.24±0.70	3.70±0.81	2.48±1.57	3.52±0.74	2.53±0.94	3.52±1.06	2.64±1.22	0.001
Health Motivation	3.73±0.86	3.81±0.59	4.01±0.53	4.02±0.46	3.87±0.64	3.55±0.87	3.55±0.60	4.09±0.70	4.04±0.75	0.024

BSE: Breast self-examination

mean scores of self-efficacy and health motivation were significantly higher in those who regularly performed BSE compared to other groups of employees. Furthermore, perceived barriers were lower in people regularly practicing BSE in comparison with other groups (Table 2). Kruskal-Wallis test results showed that the mean score of health belief model constructs regarding BSE was significantly different among different occupational groups. Moreover, physicians had the most susceptibility and self-efficacy and the least perceived barriers for BSE. Also, environmental health and laboratory personnel had the lowest perceived self-efficacy and the highest perceived barriers for BSE (Table 3).

Chi-square test results showed a significant difference among occupational groups regarding BSE stages of change (P=0.033, X2=16.754). Physicians were in the action and maintenance stages more than any other occupational groups. Spearman correlation coefficient test result showed that self-efficacy and perceived barriers for BSE had the highest (negative) correlation (r=-0.376). Also, perceived self-efficacy was positively correlated with health motivation (r=0.263) and perceived benefits (r=0.287).

We further examined the effects of occupational group, family history of cancer, perceived barriers, perceived benefits, health motivation, and BSE self-efficacy on the orderly conduct of BSE in women. The aforementioned variables were considered as covariate variables and performance or lack of regular BSE was entered as dependent variables. Logistic regression analysis showed that self-efficacy was the only variable with a significant effect on performing BSE (OR = 1.77, 95% CI = 1.22, 2.57).

Discussion

Only 26.4% of our participants were regularly performing BSE. Our participants were healthcare workers expected to act as ambassadors of health in the society. With that in mind, their level of BSE performance was not satisfactory. Other studies on Iranian healthcare workers have also shown similar unsatisfactory results; reports on the percentage of participants regularly performing BSE varies between 9% and 39.5%.[12,13,18,23] The results of Alavi et al. showed that 34.7% of gynecologists and midwives performed regular monthly BSE.[13] The difference between the current study and that of Alavi et al. regardingthe percentage of participants regularly performing BSE could be ascribed to the difference in the study population and/or the time of the studies. In their study, Yasli et al. observed that 88.4% of family health personnel performed breast self-examination, which is inconsistent with our findings.[24]

Our results also showed that 9.3% of eligible participants had been performing regular mammography as instructed, which is similar to the reports by Alavi et al.[13] who showed that 11.8% of their participants performed annual mammography. Shiryazdi et al.,[25] reported that 10.6% of female healthcare workers in Iran performed regular mammography, further supporting the findings of the current study. The results of a study in Iran showed that there were no significant differences between physicians and non-healthcare personnel regarding screening behaviors.[26]

A study conducted in Turkey showed that 12.5% of healthcare workers (slightly more than the current study) performed regular annual

mammography.[27] The slight difference may be attributed to the difference in how mammography was defined in the two studies. Furthermore, while some studies, like ours, have considered participants in the action stage as those performing regular annual mammography, others have not. In the present study, excluding those in the action stage will further reduce the percentage of participants performing regular mammography down to only 2.3%. This increases the difference in compliance to mammography among the current study and previous studies. Akhigbe and Omuemu found that only 3.1% of 40-year-old female healthcare workers in Nigeria practiced mammography.[28] In another study in Nigeria, 8% of nurses reported that they had mammography performed within the previous three years.[29] However, the results of a study among healthcare workers at a tertiary-care hospital in Brazil showed that 71.9% had undergone a mammography as a screening procedure.[30] Yasil reported that 24.1% of the participants performed mammography at least one time.[24]

Regarding the health belief model constructs, the results showed that while participants' health motivation and self-efficacy constructs increased as they moved further in the stages, their perceived barriers decreased. The foregoing findings are in agreement with the expected model in the action stage of change, the level of self-efficacy for BSE increase, while its barriers decrease. The highest, yet negative correlation, was observed between self-efficacy and perceived barriers for BSE. Self-efficacy is an important construct for surmounting the barriers of a healthy behavior, hence later added to the variables of health belief model in the 1980s.[31]

In addition, perceived confidence and health motivation were higher in participants with regular BSE compared to non-compliance participants. Conversely, perceived barriers were lower among participants who performed regular BSE. As mentioned earlier, these findings are largely in agreement with the nature of HBM. A study by Tastan et al. showed that perceived benefit, self-efficacy, lower perceived barriers, and perceived susceptibility significantly increased BSE compliance among nurses,[32] which is somewhat parallel with our findings. In their study, Gonzales et al. reported that students performing BSE in the previous year had more perceived susceptibility and confidence. In contrast, perceived barriers were conversely related to BSE performance over the past 12 months and in the future.[33] The results of a study conducted by Gençtürk et al. on midwifery students in Istanbul showed that the mean scores of the perceived benefits and perceived confidence were significantly higher in BSE performer group compared to BSE non-performers and irregular performers. Besides, perceived barriers were significantly lower in BSE performers.[34] In another study on female students in Malaysia, the results revealed that confidence positively predicted the likelihood of past BSE and the intention to perform future BSE. Perceived barriers negatively predicted past and future intention of BSE.[35]

The participants in the operational stages of BSE (action and maintenance) had more health motivation compared to those in the early stages (precontemplation and contemplation). Perceived susceptibility, severity, and benefits increased, though non-linearly, as participants moved across the stages.

In occupational groups, physicians had more susceptibility and self-efficacy and less perceived barriers compared to other groups. This finding could be due to the physicians' greater awareness and understanding of breast cancer and BSE and their direct contact with breast cancer survivals in their workplace. Similar to our findings, a study by Canbulat and Uzun in Turkey also showed that the level of health motivation and self-efficacy was higher in physicians than in midwives and nurses.[27] Canbulat and Uzun hold that the level of education influences the perceived barriers and sensitivity, self-efficacy, and health motivation toward BSE and mammography.[27] Therefore, those with higher levels of education, such as physicians, might have lower perceived barriers and sensitivity, and higher perceived self-efficacy and health motivation towards BSE and mammography compared to nurses and midwives.

Moreover, these perceptions and beliefs have led physicians to comply more with BSE and enter the action and maintenance stages. Yýlmaz and Durmus reported that physicians' perception of risk, severity, and barriers to screening behaviors was lower than that of nurses and midwives.[36] Contrary to the present study, results of a study by Mokhtary and Markani[37] showed that nurses and midwives had better performance in BSE compared to physicians.

In conclusion, we found the BSE performance of female healthcare workers of Aq Qala healthcare centers unsatisfactory. Perceived self-efficacy was the only predictor of BSE performance. Therefore, we recommend increasing individuals' perceived self-efficacy and reducing their perceived barriers in order to boost their beliefs in BSE and BSE performance. A limitation of the present study was the rather small sample size in the action and maintenance stages of BSE, particularly considering that this was a cross-sectional study. Another limitation of the present study was that participants were generally young with an average age of 32 years. Only a small number of participants were over 40 years of age. Future studies should include participants with a broader age range, especially over 40 years of age. In addition, future breast cancer screening adherence studies should consider longitudinal designs, including HBM constructs and interpersonal and community level theories such asTheory of Planned Behavior (TPB), Beliefs, Attitude, Subjective Norms, Enabling Factors (BASNEF), and Predisposing, Reinforcing and Enabling Constructs in Educational Diagnosis and Evaluation (PRECEDE).

Conflicts of Interest

None declared.

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