



# Application of the Health Belief Model in Breast Self-Examination by Iranian Female University Students

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Received 2016 July 29; Revised 2017 March 14; Accepted 2018 February 28.

## Abstract

**Background:** The present study aimed to apply the Health Belief Model (HBM) in breast self-examination among the female university students in Iran.

**Methods:** This cross-sectional study was conducted on 384 female students at Isfahan University of Medical Sciences in Isfahan, Iran. Participants were selected via simple random sampling and completed the Champion's Health Belief Model Scale (CHBMS). Data analysis was performed in SPSS version 20, and the two-tailed P-value of less than 0.05 was considered statistically significant.

**Results:** Distribution of the study population across the stages of change was as follows: pre-contemplation (n = 107; 42.8%), contemplation (n = 55; 22%), preparation (n = 32; 12.8%), action (n = 33; 13.2%), and maintenance (n = 23; 19%). Mean scores of the HBM constructs were as follows: perceived susceptibility ( $8.77 \pm 4.16$ ), perceived severity ( $24.63 \pm 5.80$ ), perceived benefits ( $22.96 \pm 12.86$ ), and perceived barriers ( $27.21 \pm 17.18$ ).

**Conclusions:** According to the results, few students were in the action and maintenance stages of breast self-examination and had inadequate knowledge regarding some of the risk factors for breast cancer. Therefore, it is recommended that educational programs be implemented to provide comprehensive information on the risk factors for breast cancer, perceived susceptibility, and self-efficacy.

**Keywords:** Student, Health Belief Model, Breast Self-Examination

## 1. Background

Breast cancer is among the major health complications in women worldwide particularly, in Iran (1). The incidence rate of breast cancer has been reported to be on the rise, ranking it as the first cancer type diagnosed in women (2). According to the Iranian Ministry of Health and Medical Education, 27 out of 100,000 women are diagnosed with breast cancer. Unfortunately, breast cancer is diagnosed in the advanced stages in more than 80% of these cases (3).

In an epidemiologic review by Mousavi, 25% of the Iranian women with breast cancer were reported to be in stage III (4). Therefore, it could be inferred that the disease has the highest mortality rate and is the most prevalent cancer type among the women in Iran (5). The highest prevalence rate of breast cancer has been reported with the age range of 45 - 55 years (6). Statistics suggest that the incidence of breast cancer has been on an upward trend in recent years in Iran (7).

Early diagnosis plays a key role in reducing the mortality and morbidity of breast cancer (8). The recommended screening techniques for the early detection of the dis-

ease include clinical breast examination (CBE), breast self-examination (BSE), and mammography (9); however, women seldom refer to health centers for these procedures (8, 10, 11). In fact, less than 20% (only 17% of the Iranian women) perform BSE (12, 13).

Evidently, BSE alone is sufficient for the early detection of breast cancer, while it is considered to be an essential screening measure in developing countries since it is cost-efficient, widely available, and easy to learn (14). Overall, BSE familiarizes women with the normal condition of the breasts, encouraging them to attend screening clinics for mammography and CBE (14, 15).

Several factors affect the practice of BSE, such as the lack of knowledge regarding early detection, perceptions toward the BSE behaviors, lack of time, and lack of self-efficacy in conducting BSE properly (16). These factors necessitate the planning of effective interventions to improve the practice of BSE (17).

Exploratory models are commonly applied to identify the influential factors in behaviors. The health belief model (HBM) is widely used as a conceptual framework to

study BSE, as well as the other breast cancer detection behaviors. HBM is frequently utilized to examine the beliefs about breast cancer screening behaviors, such as BSE (8, 18). The model consists of five constructs, including perceived susceptibility (beliefs about the likelihood of developing a disease), perceived severity (beliefs about the severity of a disease and its consequences), perceived benefits (beliefs about the potentially positive aspects of a health measure), perceived barriers (beliefs about the potentially negative aspects of a health measure), and self-efficacy (belief in one's ability to take the given measure) (19).

BSE is rarely performed by students, especially medical students. Reports have indicated that only 66% of the nursing students in Saudi Arabia and 1.3% of Egyptian students conduct BSE (20, 21).

Despite the high prevalence rate of breast cancer and benefits of BSE, no studies have been published regarding these subjects among Iranian female students at Isfahan University of Medical Sciences. Given the importance of the knowledge on breast cancer and its screening tools for medical students, the present study aimed to apply HBM in BSE by the Iranian female university students.

## 2. Methods

This cross-sectional study was conducted on 384 female students at Isfahan University of Medical Sciences in Isfahan, Iran. Participants were selected via simple random sampling. The researcher visited the classrooms, libraries, dining halls, and computer sites of the university in order to explain the objectives of the study to the students and encourage them to participate in the research. Informed consent was obtained from the participants prior to the study. The study protocol was approved by the ethics committee of Isfahan University of Medical Sciences. Inclusion criteria of the study were age of  $\geq 20$  years, no history of breast cancer, and no pregnancy or breastfeeding.

Socio-demographic data of the participants were collected, including the age range, current marital status, and academic degree and major. A questionnaire was used to evaluate the knowledge of the students about the risk factors for breast cancer (12 items). In addition, the practice of BSE was assessed in five items based on a five-stage change structure, including pre-contemplation, contemplation, preparation, action, and maintenance. In the knowledge section of the questionnaire, each correct response was scored one point, and each incorrect response was scored zero.

Another data collection tool was the Persian version of the Champion's Health Belief Model Scale (CHBMS), adapted by Taymoori and Berry (20). CHBMS had several

sections, including perceived susceptibility (three items), perceived severity (seven items), perceived benefits (six items), perceived barriers (nine items), and self-efficacy (14 items). The items of the scale were scored based on a five-point Likert scale (1: strongly disagree, 5: strongly agree). In the present study, the Cronbach's alpha for the components of CHBMS was within the range of 0.77 - 0.93 (20). The participants completed the self-administered questionnaires and were assured of confidentiality terms regarding their responses.

Data analysis was performed in SPSS version 20 (SPSS Inc., Chicago, Illinois) using descriptive statistics (mean and standard deviation) for all the variables and independent sample t-test for the continuous data. In all the statistical analyses, a two-tailed P value of less than 0.05 was considered significant.

## 3. Results

In total, 384 students within the age range of 18 - 44 years (mean:  $20.92 \pm 1.26$  years) were enrolled in the study. Demographic characteristics of the participants are presented in Table 1. The majority of the subjects (74.4%) were single, and 94.4% were undergraduate students (Table 1). Distribution of the study population across the stages of change was as follows: pre-contemplation ( $n = 107$ ; 42.8%), contemplation ( $n = 55$ ; 22%), preparation ( $n = 32$ ; 12.8%), action ( $n = 33$ ; 13.2%), and maintenance ( $n = 23$ ; 19%).

The results indicated statistically significant associations between marital status ( $P = 0.002$ ) and education level of the students ( $P = 0.031$ ) with the practice of BSE, so that married students performed BSE more frequently compared to the single students. However, no significant correlations were observed between the other demographic factors and BSE.

Among the demographic variables, age had a significant association with perceived susceptibility ( $P = 0.024$ ), perceived barriers ( $P = 0.014$ ), and self-efficacy ( $P = 0.011$ ), while the other demographic factors had no significant associations with the components of the HBM.

A large number of the students had an extensive knowledge of the risk factors for breast cancer. According these participants, the most widely recognized risk factors were aging (77.6%), family history of breast cancer (77%), and radiation therapy to the chest (69.6%). On the other hand, maternal age of  $>30$  years in the first full-term pregnancy and no experience of pregnancy were not regarded as the risk factors for breast cancer by the majority of the students (Table 2).

Mean scores of the HBM constructs in the present study were as follows: perceived susceptibility ( $8.77 \pm 4.16$ ), perceived severity ( $24.63 \pm 5.80$ ), perceived benefits ( $22.96 \pm$

**Table 1.** Demographic Characteristics of Students<sup>a</sup>

| Variables              | (N = 384)        |
|------------------------|------------------|
| <b>Age, y</b>          |                  |
| Mean $\pm$ SD          | 20.92 $\pm$ 1.26 |
| Age range              | 18 - 44          |
| <b>Marital status</b>  |                  |
| Single                 | 186 (74.4)       |
| Married                | 64 (25.6)        |
| <b>Academic degree</b> |                  |
| Undergraduate          | 236 (94.4)       |
| MSc                    | 2 (0.8)          |
| PhD                    | 12 (4.8)         |
| <b>Major</b>           |                  |
| Nutrition              | 32 (12.8)        |
| Health                 | 121 (48.4)       |
| Medicine               | 16 (6.4)         |
| Nursing and midwifery  | 21 (8.4)         |
| Management             | 12 (4.8)         |
| Paramedical sciences   | 48 (19.2)        |

<sup>a</sup>Values are expressed as No. (%).

12.86), and perceived barriers (27.21  $\pm$  17.18). Data on the self-efficacy constructs of BSE practice in the students are shown in Table 4. According to the results of the independent t-test, the practice of BSE had a significant associations with perceived severity ( $P = 0.011$ ), perceived barriers ( $P = 0.005$ ), and self-efficacy ( $P = 0.0001$ ).

#### 4. Discussion

In the current study, more than half of the respondents (77.6%) were in the pre-contemplation, contemplation, and preparation (pre-action) stages in the practice of BSE. Our findings are consistent with the studies conducted in other countries (21, 22). For instance, only 19.6% of the students in Malaysia have been reported to perform BSE (23).

While the majority of women seem to be aware of BSE, they might lack the adequate knowledge regarding the proper practice of this screening measure (24). The reason is that BSE requires self-efficacy, which is regarded as an indispensable prerequisite for the practice of both BSE and BCE (25, 26).

In the present study, 60% of the subjects stated that they lacked the required skills for BSE. Similarly, some studies have also confirmed that women never know the proper

techniques to perform BSE (1, 21, 22). According to our findings, it is of paramount importance to promote BSE and enhance the self-efficacy of students through the HBM by implementing training courses. A systematic review regarding the effect of the HBM on the early diagnosis of breast cancer supports the findings of the current research in this regard (27). On the other hand, Haji-Mahmoodi has claimed that the female staff in healthcare centers had adequate knowledge of the BSE and confirmed its effectiveness in the early detection of breast cancer; however, only 6% conducted BSE regularly (10). This finding highlights the need for the improvement of self-efficacy in the practice of BSE.

In the present study, a high percentage of the students were aware of the risk factors for breast cancer, such as genetic factors and family history. Similarly, the most widely recognized risk factors by Turkish high school students were reported to be personal history (68.7%) and family history of breast cancer (67.0%). Although the students in the current research were aware that breast cancer was associated with genetic factors (16), less than half of them could correctly answer the questions regarding early menarche (< 12 years) and late menopause (> 55 years). Undoubtedly, knowledge of the students about the risk factors for breast cancer must be enhanced through academic courses. It is also notable that in the results obtained by Dina and Haftom are consistent with the findings of the current research (1, 28-30).

In the present study, mean score of perceived susceptibility was 8.37  $\pm$  2.43, which does not seem to be high and could be due to the low mean age of the students. In their study, Johnson and Dickson-Swift stated that young women believed that they were not at the risk of developing breast cancer (31). In another research performed on female students in Malaysia, Aktari denoted that inattention of young women to the risk of breast cancer might be due to the false perception that they are generally healthy and do not need to perform BSE (23). Collective evaluation of the perceptions of women toward BSE could contribute to designing appropriate educational interventions to affect the attitudes toward breast cancer screening (8, 32).

In the current research, more than half of the participants (59.6%) asserted that the risk of mortality as a consequence of breast cancer reduced by performing BSE, while 58% affirmed that the likelihood of chemotherapy or breast removal diminished by practicing BSE. However, the majority of the students had inadequate knowledge of breast cancer risk factors.

According to the results of the present study, more than 50% of the students considered BSE to be distressing. As mentioned by Hussein, fear is a major obstacle to BSE practice, which is in line with our findings (33). Further-

**Table 2.** Knowledge of Students about Risk Factors for Breast Cancer

| Risk Factors                                       | True, No. | %    | False, No. | %    |
|----------------------------------------------------|-----------|------|------------|------|
| <b>Aging</b>                                       | 194       | 77.6 | 56         | 22.4 |
| Early menarche (< 12 years)                        | 103       | 41.2 | 147        | 58.8 |
| Late menopause (> 55 years)                        | 76        | 30.4 | 174        | 69.6 |
| <b>Genetic factors</b>                             | 138       | 55.2 | 112        | 44.8 |
| Family history of breast cancer                    | 185       | 74   | 65         | 26   |
| Oral contraceptive use                             | 171       | 68.4 | 79         | 31.6 |
| Hormonal therapy                                   | 114       | 45.6 | 136        | 54.4 |
| No breastfeeding                                   | 124       | 49.6 | 126        | 50.4 |
| Radiation therapy to the chest                     | 174       | 69.6 | 76         | 30.4 |
| Age of > 30 years at the first full-term pregnancy | 95        | 38   | 155        | 62   |

**Table 3.** Description of HBM Constructs (N = 384)

| HBM Construct            | Possible Score Range | Min - Max | Mean ± SD    |
|--------------------------|----------------------|-----------|--------------|
| Perceived susceptibility | 1 - 15               | 3 - 15    | 8.37 ± 2.43  |
| Perceived severity       | 1 - 35               | 10 - 35   | 23.83 ± 4.65 |
| Perceived benefits       | 1 - 30               | 6 - 30    | 20.56 ± 3.86 |
| Barriers                 | 1 - 45               | 9 - 36    | 23.37 ± 4.87 |
| Self-efficacy            | 1 - 50               | 10 - 47   | 24.73 ± 8.78 |

**Table 4.** Self-Efficacy Constructs in BSE Practice in Female Students<sup>a</sup>

| Self-Efficacy                                                                  | Strongly Disagree | Disagree   | Do Not Know | Strongly Agree | Agree     |
|--------------------------------------------------------------------------------|-------------------|------------|-------------|----------------|-----------|
| I know how to perform BSE.                                                     | 63 (25.2)         | 106 (42.4) | 37 (14.8)   | 31 (12.4)      | 13 (5.2)  |
| I can perform BSE correctly.                                                   | 47 (18.8)         | 79 (31.6)  | 61 (24.4)   | 56 (22.4)      | 7 (2.8)   |
| I could find a breast lump by performing BSE.                                  | 69 (27.6)         | 71 (28.4)  | 56 (22.4)   | 47 (18.8)      | 7 (2.8)   |
| I am able to find a breast lump that is the size of a walnut.                  | 55 (22)           | 52 (20.8)  | 66 (26.4)   | 68 (27.2)      | 9 (3.6)   |
| I am able to find a breast lump that is the size of a hazelnut.                | 59 (23.6)         | 42 (16.8)  | 67 (26.8)   | 67 (26.8)      | 15 (6)    |
| I am able to find a breast lump that is the size of a pea.                     | 72 (28.8)         | 45 (18)    | 100 (40)    | 25 (10)        | 8 (3.2)   |
| I am sure of the steps to follow for doing BSE.                                | 94 (37)           | 73 (29.2)  | 39 (15.6)   | 27 (10.8)      | 17 (6.8)  |
| I am able to tell something is wrong with my breast when doing BSE.            | 112 (44.8)        | 48 (19.2)  | 60 (24)     | 20 (8)         | 10 (4)    |
| I am able to tell something is wrong with my breast when I look in the mirror. | 58 (22)           | 67 (26.8)  | 56 (22.4)   | 55 (22)        | 14 (5.6)  |
| I can use the correct part of my fingers when examining my breasts.            | 67 (26.8)         | 58 (23.2)  | 44 (17.6)   | 42 (16.8)      | 39 (15.6) |

<sup>a</sup>Values are expressed as No. (%).

more, Karayur has stated that 45.6% of students regarded the fear of finding a lump to be a barrier in the practice of BSE (16). These findings are consistent with the current literature in this regard (34). As a result, it could be concluded that fear may discourage women from performing BSE.

Evidently, early detection of breast cancer could remarkably contribute to effective treatment and increase the survival rate. Therefore, it is recommended that health-care educational interventions be developed based on the HBM in order to enhance perceived susceptibility and self-efficacy and eliminate barriers, such as the common con-

cerns about BSE.

#### 4.1. Limitations of the Study

This cross-sectional study was performed on the female students at Isfahan University of Medical Sciences. However, the findings cannot be generalized to all the female university students in Isfahan.

#### 4.2. Conclusion

According to the results, few students were in the action and maintenance stages of BSE, and lack of knowledge about some of the risk factors for breast cancer was also noticeable among the female students at Isfahan University of Medical Sciences. Therefore, expanding the knowledge of students about the risk factors for breast cancer and benefits of early detection by performing BSE is essential. Furthermore, educational interventions should be developed to provide comprehensive information on breast cancer risk factors, perceived susceptibility, and self-efficacy so as to improve the knowledge and skills of women in this regard, which will definitely contribute to the early diagnosis and effective treatment of the disease.

#### Acknowledgments

None declared.

#### Footnotes

**Authors' Contribution:** None declared.

**Conflicts of Interest:** None declared.

**Financial Disclosure:** None declared.

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