Can Health Belief Model Predict Breast Cancer Screening Behaviors?

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Abstract

BACKGROUND: Breast cancer is the second cause of cancer-related death among women. Prevention programs insist on the early diagnosis and screening to reduce the mortality rate.

AIM: The study was conducted to determine the predictors of breast cancer screening behaviours based on the health belief model.

MATERIAL AND METHODS: The present cross-sectional study was conducted by involving 304 women ranging from 20 to 65 years of age, living in East Guilan cities, the North of Iran, in 2015 using two-stage cluster sampling. The research instrument was Champion's Health Belief Model Scale. The data were analysed based on Regression test by using SPSS software version 18.

RESULTS: The results showed perceived benefits (ExpB = 1.118, p = 0.009), self-efficacy (ExpB = 1.122, p = 0.001) and the perceived barriers (ExpB = 0.851, p = 0.001) as the predictors of breast self-examination. In addition, the study revealed that the two components of perceived benefits (ExpB = 1.202), and the perceived barriers were the predictors of mammography (ExpB = 0.864) (p = 0.001). None of the health belief model components showed a role to predict clinical breast examination (P > 0.05).

CONCLUSION: The present study highlights the need for educational programs, which should focus on increasing breast self-exam skills and understanding the benefits of healthy behaviours and eliminating their barriers.

Introduction

Breast cancer is one of the most common types of cancers [1]. This cancer is considered as the first common cancer among Iranian women [2] and the third cause of cancer leading death in women [3]. In almost 70 percent of cases, the disease is detected at the end stage, and hence the treatment becomes difficult. Detection of breast cancer in early stage led to an almost complete cure, and with timely diagnosis and effective treatment, the survival rate can be up to 90 percent [4] [5]. Therefore, a detailed screening program can effectively detect the early stages of the disease and prevent malignancy in the advanced stages [6].

The proposed breast cancer screening methods are mammography, clinical breast examination (CBE) and breast self-examination (BSE) [7]. Previous studies indicated that the self-examination is the most important step in identifying cancer in early stages [8]. It also causes women to pay more attention to changes in their breasts and to go faster for clinical examination and mammography [9]. However, despite its high efficacy in reducing mortality, various research findings showed that the adoptions of such behaviours by women in different populations are low. Several factors may affect the

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performance or non-performance of breast screening behaviours that are essential to identify them to reinforce these behaviours. In health education, various theoretical models used to study the health behaviour such as the Champion Health Belief Model (CHBM) introduced by Champion in the 1980s. This model has been widely used by researchers [8]. According to this model, behavioral beliefs and modifying factors are effective in shaping behavior and when a woman is susceptible to breast cancer (perceived susceptibility) and aware of the threat of disease on their health (perceived severity) and also know the benefits of screening methods (perceived benefits) than its barriers (perceived barriers), she most likely will follow the screening methods [9].

Considering the risk factors for breast cancer, the main emphasis of breast cancer prevention programs is focused on early detection and screening to reduce mortality [10]. According to the previous studies, the health behaviours in using clinical examination, self-examination and mammography are low [11], and there is not sufficient information about the predictive factors of breast cancer screening behaviours, especially in northern areas of Iran. Therefore, in this study, the researchers decided to use CHBM to predict the behaviour of breast cancer screening among the women of East Guilan cities. It is hoped that the results of this research could help improve health decisions for designing effective educational interventions to reduce breast cancer.

Material and Methods

This article is part of a larger cross-sectional study was conducted on women of East Guilan, the North of Iran, in 2015.

The sample size estimated 304 by using the sample size formula with a confidence level of 95%. Inclusion criteria were age between 20 to 65 years living in East Guilan cities (Lahijan, Astaneh, Langerud, Roudsar) and exclusion criteria were breastfeeding, pregnancy and having breast cancer.

The data were collected through two-stage cluster sampling. The research instrument was Champion's Health Belief Model Scale (CHBMS). The questionnaire contains 57 items that were answered based on the five degrees Likert scale. Each item has 5 response choices ranging from strong disagreement (1 point) to strong agreement (5 points). The HBM subscales were included the perceived susceptibility (3 items), Seriousness (7 items), BSE Benefits (6 items), BSE Barrier (9 items), BSE self-efficacy (confidence) (10 items), health motivation (7 items), benefits of mammography (6 items), barriers of mammography (9 items). All the items had five response choices ranging from strongly disagree = 1

to agree = 5 strongly. Higher scores express more agreement with health beliefs except for barriers to mammography [12].

The reliability of this scale has been tested in different populations and calculated between 0.6-0.89 using Cronbach's Alpha coefficients [13]. Reported Cronbach alpha coefficients for a Farsi version of HBM ranged from 0.72-0.84 [12].

Data were analysed by descriptive statistics and regression test using SPSS software version 18.

The present study and its protocol were approved by the Institutional Human Ethics Committee of Lahijan Islamic Azad University. The researcher entered the research setting only after proper information to the participants about the purpose of the study. The written consent was obtained from all the participants by ensuring that the questionnaires were anonymous. Each participant was completely free to participate in the study.

Results

The results regarding demographic characteristics showed the age distributions were almost equal in all three age groups (20-30, 31-40 and 41-65 years of age) are shown in Table 1 below. The majority of women (78%) were married, with higher education (41.1%), housewives (75%), and with moderate family's income (92.4%). The majority of the participants (67.3%) had not regular checks, were with no history of breast cancer (95%), and had no family history of breast cancer (90.8%) (Table 1).

Table 1: Distribution of demographic variables among the women ranging from 20 to 65 years of age, living in East Guilan cities (N=304)

Variable		N	%	Variable		N	%
Age group (years)	20-30	100	32.9	History of benign breast lumps	Yes	15	5
	31-40	105	34.5		No	289	95
	41-65	99	32.6	The family history of breast cancer	Yes	28	9.2
Education	Illiterate	20	7.2		No	276	90.8
	Primary-Secondary	62	20.4	Having children	Yes	215	70.7
	High school diploma	97	31.9		No	89	29.3
	Academic	125	41.1	Regular check-up	Yes	100	32.7
Job status	Housewife	228	75		No	204	67.3
	Employed	76	25	Menopause	Yes	254	83.6
Family income	Less than average	23	7.6		No	50	16.4
	Average	145	47.7	Lactation history	Yes	202	66.4
	More than average	136	44.7		No	102	33.6
Marital status	Single	55	18.1				
	Married	237	78				
	Widow and divorced	12	3.9	Health insurance	Yes	252	82.9
					No	52	17.1

Data expressed as Frequency (n) and Percentage (%).

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The predictor factors of screening behaviours (BSE, CBE and mammography), according to the logistic regression are shown in Tables 2, 3 and 4.

In relation to the predictor factors of breast self-examination (BSE), Table 2 shows that by increasing only one point in the perceived benefits score, the probability of self-examination significantly increase to 0.112 times (p = 0.009) and one point increase in the self-efficacy score, increases the probability of self-examination to 0.115 times with a significant increase (p = 0.001). The findings also indicate that by increasing in perceived barriers, the possibility of self-examination will be reduced to -0.161 times with a significant decrease (p = 0.001). On the other hand, women who have more self-efficacy and perceived benefits and less perceived barriers have more rates of making BSE. However, among the other subscales (perceived susceptibility, perceived seriousness and health motivation) there was no difference between the two groups regarding performing or not performing the self-examination (P > 0.05).

Table 2: Comparison of performance and prediction of BSE based on the HBM among the investigated women (N=304)

Components of HBM	BSE		B	Exp (B)	P.value
	Yes Mean ± SD	No Mean ± SD			
Perceived susceptibility	6.88±2.52	6.68±2.82	0.094	1.099	0.102
Perceived seriousness	20.40±5.32	20.80±5.99	0.006	1.006	0.838
Perceived benefits	23.31±3.30	20.74±4.51	0.112	1.118	0.009**
Perceived barriers	14.30±4.42	18.32±5.48	-0.161	0.851	0.001***
Self-efficacy	30.12±4.44	26.29±6.34	0.115	1.122	0.001***
Health motivation	26.67±4.35	24.95±5.31	0.013	1.013	0.696

Note: BSE = breast self-examination; HBM = Health Belief Model; Data expressed as mean ± S.D, B (coefficient) and Exp(B) (the exponentiation of the B coefficient, which is an odds ratio); Significant difference of values is indicated by **p < 0.01 and ***p ≤ 0.001.

As for the predictor factors of clinical breast examination, Table 3 shows that by increasing in HBM subscales, despite changes as increase or decrease in results, they could not significantly affect the probability of clinical breast examination. In other words, the results indicated that none of the health belief model subscales has a role in predicting clinical breast examination performance.

Table 3: Comparison of performance and prediction of CBE based on the HBM among the investigated women (N=304)

Components of HBM	CBE		B	Exp (B)	P.value
	Yes Mean ±SD	No Mean ±SD			
Perceived susceptibility	6.77±2.86	6.74±2.67	0.036	1.036	0.542
Perceived seriousness	20.37±5.75	20.74±5.75	-0.006	0.994	0.823
Perceived benefits	22.71±4.54	21.39±4.19	0.018	1.018	0.675
Perceived barriers	16.11±5.88	17.03±5.32	-0.033	1.033	0.307
Self-efficacy	28.51±6.45	27.48±5.84	0.018	1.018	0.525
Health motivation	26.57±6.36	25.30±4.54	0.001	1.001	0.987

Note: CBE = clinical breast examination; HBM=Health Belief Model; Data expressed as mean ±S.D, B (coefficient) and Exp(B)(the exponentiation of the B coefficient) ;Significant level= *p < 0.05.

About the predictor factors of mammography, Table 4 shows that by increasing one point in the perceived benefits score, the probability of

mammography will be increased to 0.184 times with a significant increase (p = 0.001). The findings also indicate that by only one point increase in the perceived barriers score, the possibility of performing mammography is significantly reduced to -0.146 times (p = 0.001). In other words, women with more perceived benefits and less perceived barriers, have more rates to perform mammography. However, among the other subscales (perceived susceptibility, perceived seriousness, self-efficacy and health motivation) there was no difference between the two groups about performing mammography (P > 0.05).

Table 4: Comparison of performance and prediction of mammography based on the HBM among the investigated women (N=304)

Components of HBM	Mammography		B	Exp (B)	P.value
	Yes Mean ±SD	No Mean ± SD			
Perceived susceptibility	7.46±2.87	6.64±2.67	0.123	1.131	0.108
Perceived seriousness	21.27±5.96	20.56±5.71	0.035	1.036	0.348
Perceived benefits	22.54±5.93	21.12±5.01	0.184	1.202	0.001***
Perceived barriers	22.10±5.95	26.30±6.26	-0.146	0.864	0.001***
Self-efficacy	28.22±5.18	27.64±6.11	0.018	1.018	0.525
Health motivation	26.00±6.05	25.53±4.87	-0.037	0.963	0.418

Note: HBM = Health Belief Model; Data expressed as mean ± S.D, B (coefficient) and Exp(B)(the exponentiation of the B coefficient); a Significant difference of values is indicated by ***p ≤ 0.001.

Discussion

The present study aimed to predict the factors affecting the breast cancer screening behaviours in women from 20 to 65 years of age living in East Guilan cities.

The results demonstrated that self-efficacy and perceived benefits predict breast self-examination (BSE) directly and perceived barriers affect inversely. However, other components of HBM (perceived susceptibility, perceived seriousness, and health motivation) could not predict breast self-examination.

Different studies have been reported various results about predictive factors of breast cancer screening behaviours. The results of Hasani's study (2011), who aimed to predict HBM factors among the women referred to health centres in Bandar Abbas are by the present study. They also observed perceived benefits and self-efficacy were predictors of breast self-examination and perceived barriers were inverse predictors [8].

This is in contrast to the study carried out by Sahraee et al. (2013) whose study found that self-efficacy impact directly and perceived severity had the opposite effect on breast self-examination [14]. Mahmoudi et al., (2011) showed that perceived susceptibility, perceived seriousness, health motivation, self-efficacy; perceived benefits predicted directly breast self-examination and perceived barriers

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were its inverse predictor [15]. Nourizade et al., (2010) observed a significant correlation between perceived seriousness and mammography [16]. Ghourchaei et al., (2013) reported an inverse relationship between perceived seriousness and BSE. Similarly, we also showed a correlation between the health belief model components and clinical breast examination. However, a significant relationship was observed between perceived susceptibility and mammography [17].

In the present study, perceived benefits and self-efficacy were the main predictors of breast self-examination. Perceived benefits mean positive results by avoiding disease exposure. For example, the smallest suspicious mass can be detected by monthly breast self-examination [8]. Self-efficacy is person's confidence in her ability to carry out successful and accurate BSE and diagnose the suspected tumour. Therefore, educational programs should be focused on proper planning and training to increase women's self-efficacy about breast self-examination. On the other hand, reducing the BSE barriers could also have been an important role in predicting breast self-examination [8].

The results of the present study also showed that perceived benefits were directly predictor of mammography and perceived barriers were its reverse predictor. However, other components (perceived susceptibility, perceived seriousness, self-efficacy and health motivation) were not predictors of mammography. This is in agreement with various previous studies [18] [19] [20] [21]. But the results of Taymoori and colleague (2014) and Noroozi et al. (2011) reported self-efficacy as the most important predictor of mammography cannot support our results [2] [22] directly.

However, reducing barriers can increase perceived benefits, and self-efficacy affect indirectly on perceived benefits and perceived barriers to do mammography [22]. In the Iranian women's culture, barriers to mammography include pain, anxiety, fear of radiation, and the absence of clinical signs of breast cancer [23] [24]. Therefore, proper planning is recommended to minimise these factors and provide background to encourage women to do health behaviours. It is possible to promote women's health literacy by providing the booklet or educational pamphlet. Also, it can be achieved through the creation of health campaigns and networks. Moreover, it is suggested that health care centres reduce barriers by providing easy access to screening examination for clients.

The overall findings of this study showed that self-efficacy, perceived benefits and perceived barriers could predict BSE behaviour and the perceived benefits and barriers could predict mammography. So educational interventions must be considered to improve health behaviours as skills for BSE. Further, increasing understanding of the benefits and the elimination of barriers to health behaviours through correct training is required. Also, proper planning is recommended for the implementation of educational interventions to promote screening programs.

Acknowledgements

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