J PREV MED HYG 2018; 59: E277-E281

ORIGINAL ARTICLE

An educational intervention on based information, motivation and behavior skills model and predicting breast self-examination

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Keywords

Breast self-examination • Educational intervention and information • Motivation and behavior skills model

Summary

Introduction. *Breast self-examination recommend as a breast screening method in developing countries where there are limited access to other screening methods. Therefore promoting breast self-examination required to identify effective interventions and relevant factors.*

Methods. *This study was a quasi-experimental design carried out among 314 women 20-69 years in community cultural centers in Isfahan city, Iran. Sampling was conducted from April to 10 August, 2016. A structured questionnaire was used for data collection in before and after the educational intervention. Then participants were followed by phone call after one month for breast self-examination performance. We used descriptive statistical analysis (mean, standard division, frequency distribution), and also other statistical methods (Paired t-test, Pearson's correlation and logistic regression).The data were analyzed using SPSS version 18 with considering a significant level less than 0.05.*

Results. *There was significant difference between mean scores of information, motivation and behavior skill before and after intervention ($P < .0001$). After one month following 205 of women (72.2%) reported to perform breast self-examination. Pearson's correlation showed that breast self-examination significantly correlated with information ($r = .305$, $p = .000$), motivation ($r = .128$, $p = .031$) and behavior skills ($r = .161$, $p = .006$). Also the logistic regression results demonstrated that information ($p < .001$, $OR = 1.071$), motivation ($p = .045$, $OR = .978$) and behavior skills ($p = .001$, $OR = 1.033$) predicted breast self- examination.*

Conclusions. *Considering the results of this study, it appears that the use of educational interventions based on three constructs of information, motivation and behavior skills can be used to promote breast self-examination. Moreover these results can apply to improve breast self-examination among women by health care providers.*

Introduction

Cancer is the most common diseases leading mortality in world [1]. In recent years, breast cancer was one of the main diagnosed cancers among women (1.67 million) after lung cancer (1.82 million) globally. The data from Globocan in 2012 showed of the 1,600,000 new cases of breast cancer, 794,000 and 883,000 were in the more and less developed world respectively. But the deaths in the less developed world were higher, the 324,000 compared with 198,000 in more developed world [2]. Although the incidence of breast cancer was reported lower in less developed countries, the mortality rate of breast cancer in these countries was higher [3]. On the other hand in numerous developing countries, the incidence of breast cancer is rising severely [4]. The findings of the 10-year national cancer registry of Iran showed that breast cancer as the most common of cancer in Iranian females has the crude incidence 22.6 per 100,000 females annually [5].

Early detection of breast cancer is important, especially in low- and middle-income countries where breast cancer is diagnosed in late stages [6]. Mammography is an expensive method for breast cancer screening and requires logistic and trained manpower, while breast self-examination can be the only realistic method to the initial detection of breast cancer in developing countries [7]. For that reason there are no population-based mammography screening programs in Iran country and breast self-examination is recommended as a practical method for breast cancer screening [8]. However, Breast self-examination alone is not enough for early detection of breast cancer; it can increase breast health awareness of women and be responsible for their own health [9]. On the other hand breast self-examination can be performed by women and without help of health providers. Despite these advantages, Montazeri et al. revealed that only 17% of women performed breast self-examination regularly. They also indicated that 20% and 63% of women occasionally and never carried out breast self-examination, respectively [7].

Another study in 2012 noted that the rate of breast self-examination in Iranian women's was low and only 12.9% of women performed it regularly [10].
Numerous factors about participation of women in breast self - examination have been proposed. Avci et al. mentioned a relationship between health motivation and performing of breast screening methods [9]. Kawar showed embarrassment, fatalism, fear and stigmatization of cancer decreased breast cancer screening participation [11]. An American study revealed lack of knowledge as a barrier [12]. Others also demonstrated that women who never used from methods of breast screening, had lack of knowledge [7, 13]. Although a lot of women failure breast self-examination due to not know how to perform it correctly [14], there is evidence to show high self-efficacy was significantly associated with breast self-examination [15].
Consequently, a number of researches focused on interventions to increase breast cancer screening behavior [16]. The recently, information, motivation and behavioral skills model was introduced by Fisher and Fisher [17]. They firstly used this model to explain the behavior associated with HIV [18].This model mention to three constructs; information, motivation and behavioral skills. Each of these construct associate with performance a behavior. Moreover there are a numerous relationship among these constructs [17]. This model has useful aspects. First of all the IMB model is able to simply explain complex health behaviors [18].
Secondly, it can be considered as social psychological conceptualization and utility to increase health-related behavior [19]. Thirdly a successful self-management such as breast self- examination needs detect information, motivation and behavioral skills which are considered in this model [18].

Materials and methods

A quasi experimental design (before and after intervention) was used in this research. We invited women living in a region of Isfahan city to attend in educational classes using a numerous of advertising such as banners, flyers and free Messages.
Sampling was conducted from April to 10 August, 2016 in four community cultural centers of city. Community cultural centers have been created by municipality in numerous places of the district. In these centers, various classes are being held in different fields for women and children, such as arts, aerobics and healthcare. Likewise, these places have been appropriate settings for educational intervention in women who had lived in the region.
In this study inclusion criteria were included 20 to 69 years old women that have no history of breast cancer or specific diseases, being able to read and write and not having history of breast self- examination.
Women who have inclusion criteria participated in a two-hour class. They were educated by role playing, lecture and Power Point presentation. The education materials were provided based on Iranian Ministry of Health and Medical Education protocols. For performing role playing, first of all a scenario was written. Later some participants voluntarily were selected to play the scenario. The roles were included a client, a mother of client and a midwife. The researcher played as midwife. Then role playing was performed by players and rest of women observed it. Next women discussed and commented on the matter. Consequently all members of every group had an opportunity to share their experience and problems together.
Participation in this study was also on based written informed consent. A structured questionnaire was used for data collection. The data was collected using the questionnaire before and after the educational intervention on 314 women. The questionnaire included 40 questions in four domains: socio-demographic characteristics (n = 4), information (n = 22), and motivation (n = 7) and behavior skills (n = 7). A 5-point Likert scale from strongly disagree to strongly agree was used for answers to the questions of motivation and behavior skills. Yes/ no/ don't know questions were designed to check information.
The questionnaires were verified by a number of faculty members who were specialized in the field; such as health and midwifery. Also we determined reliability questionnaire by Cronbach's alpha. That was 0.80, 0.75 and 0.84 for information, motivation and behavior skills questions respectively. Consequently the questionnaire had adequate internal consistency. In addition, test retest method was used with 2-week interval in 15 women for reliability and in final sampling the 15 questionnaires were omitted.
In this study, the motivation was considered as personal and social motivation according to Fisher's proposition [18]. Social motivation encompassed perceived social support to perform breast self-examination and personal motivation comprised of beliefs about the outcome of interventions and attitude towards breast self-examination. Moreover, two concepts of objective individual skills and self-efficacy were considered as behavior skills in the model of information, motivation and behavior skills in this study [20].
Participants in the study were followed up with a phone call after a month of educational interventions for performing breast self- examination. Of the total samples (314 persons), 284 individuals responded to the call.

Data analysis

The data were analyzed using SPSS version 18 with considering a significant level less than 0.05. Descriptive statistical analysis (mean, standard division and frequency distribution), and also other statistical methods (Paired t-test, Pearson's correlation and logistic regression) were considered to analyze.
Pearson's Correlation was used for investigating the relationship between dependent variable (breast self-examination performance) and independent variables

(Age, Number of child, Education, Marital Status, Information, Motivation and Behavior skills). Moreover we used Logistic regression model to predict breast self-examination among the women.

In this study the sample size was concluded using $n = z^2 p(1-p)/d^2$. We assumed p = 25%, $Z^2 = 1.96$ and d = 0.05. In addition nonresponse was considered10%. The final sample size was determined to be about 300 in educational intervention.

Ethical consideration

This study was approved by Ethics Committee of the Medical Research of Isfahan University of Medical Sciences with the number of IR.MUI.REC.1394.3.256.

Results

A total of 314 participants with the average age and number of children (mean ± standard deviation) 45.53 ± 10.99 and 2.79 ± 1.74 respectively were entered into this study. Approximately majority of participants were married (90%). Moreover, 43.9% of them had obtained high school diploma.

Results of Paired t- test demonstrated that there was significant difference between mean scores of information, motivation and behavior skill before and after the educational intervention (P < .001) (Tab. I).

After one month following 205 of women (72.2%) reported to perform breast self-examination. Percentage of breast self- examination in women aged 50 to 59 (23.2%); married (66.2%), with high school education (42.3%) and two children (22.5%) were higher of other women in same groups (Tab. II).

Although the findings of Pearson's correlation revealed that there was positive significant correlation between education and breast self-examination (r = .129, p = .029), the study results indicated no significant correlation between other socio-demographic characteristics and breast self-examination. Additionally, Pearson's correlation showed that breast self-examination significantly correlated with information (r = .305, p = .000), motivation (r = .128, p = .031) and behavior skills (r = .161, p = .006) (Tab. III).

We used logistic regression analysis to predict breast self-examination behavior. Therefore, independent variables were considered in logistic regression analysis. The analysis results showed participants who had more information (p < .001, OR = 1.071), motivation (p = .045, OR = .978) and behavior skills (p = .001, OR = 1.033) were more probable to perform breast self-examination behavior. But logistic regression analysis didn't demonstrate a significant correlation between education (p = .299) and breast self-examination performance (Tab. IV).

Tab. I. Mean and standard division (SD) of information, motivation and behavior skills scores before and after intervention.

	Before		After		T test	P-value
	Mean	SD	Mean	SD		
Information	64.43	19.62	91.00	9.42	22.85	< .001
Motivation	79.46	13.71	89.41	10.02	11.78	< .001
Behavior skills	77.36	15.48	90.63	10.41	15.15	< .001

Tab. II. Frequency distribution of breast self- examination performance based on socio-demographic characteristics.

Socio-demographic characteristics	Breast self-examination performance - N (%)		
	No	Yes	Total
Age			
20-29	4 (1.4)	11 (3.9)	15 (5.3)
30-39	23 (8.1)	50 (17.6)	73 (25.7)
40-49	24 (8.5)	61 (21.5)	85 (30.0)
50-59	18 (6.3)	66 (23.2)	84 (29.5)
60-69	10 (3.5)	17 (6.0)	27 (9.5)
Education			
Primary	30 (10.6)	56 (19.7)	86 (30.3)
High school	39 (13.7)	120 (42.3)	159 (56.0)
University	10 (3.5)	29 (10.2)	39 (13.7)
Marriage status			
Marriage	68 (23.8)	188 (66.2)	256 (90)
Divorced	1 (.40)	3 (1.1)	4 (1.5)
Widow	5 (1.8)	11 (3.9)	16 (5.7)
Unmarried	5 (1.8)	3(1.0)	8(2.8)
Number of child			
0	4 (1.4)	13 (4.6)	17 (6.0)
1	8 (2.8)	27 (9.5)	35 (12.3)
2	29 (10.2)	64 (22.5)	93 (32.7)
3	15 (5.3)	39 (13.7)	54 (19.0)
4	11 (3.9)	26 (9.2)	37 (13.1)
≥ 5	12 (4.2)	36 (12.7)	48 (16.9)

Tab. III. Pearson's correlation of independent variables and breast self-examination performance.

Independent variables	Breast self-examination performance	
	Pearson correlation	Sig. (2-tailed)
Age	.012	.841
Number of child	.017	.779
Education	.129	.029
Marital Status	.11	.065
Information	.305	.000
Motivation	.128	.031
Behavior skills	.161	.006

Discussion

This study focused on investigation of educational interventions based on information, motivation and behavior skills model and predicting breast self-examination. The results of this study indicated that the use of lecture, Power Point presentation and role-playing as an educa-

Tab. IV. Results of logistic regression analysis.

Variable	B	S.E.	P value	Odds ratio	Confidence interval of Odds Ratio
Information	.066	.017	.000	1.071	1.033-1.105
Motivation	.033	.018	.045	0.978	0.947-0.981
Behavior skills	.051	.015	.001	1.033	1.010-1.075
Education	.088	.086	.299	0.981	0.957-1.198

tional intervention were accompanied by an increase in information, motivation and behavior skills in women.
These results agreed with findings of previous educational interventions which used a range of interventions. The study of Rahimparvar et al. (2017) demonstrated that audio visual teaching can increase the self-efficacy [21]. The findings of a research by Zeinomar showed Power Point presentations improved knowledge of breast cancer [22]. Avci and Gozum used video and the model group as educational interventions. They showed the video group improved knowledge of breast self- examination and the model group increased knowledge, perceived self-efficacy and skill of perform breast self- examination [23].
Other studies have found that role playing method improved knowledge, skills [24], intentions to health behavior [25] and self-efficacy [26].
Additionally, significant changes in awareness and perception of women about cancer and screening were reported through using lecture and movies [27].
The results of our study disclosed that three constructs of information, motivation and behavior skills had a significant correlation with breast self-examination after a month of interventions. In line with the findings of this study, results of Misovich's study revealed a correlation among breast self-examination, information, motivation and behavioral skills [28]. They mentioned the connection between IMB model`s constructs and a health behavior using a cross-sectional study and proposed designing interventions based on this model in order to improve health behavior.
In addition, the findings of present study showed that information, motivation and behavior skills in IMB model played a role in predicting the breast self-examination behavior. Therefore, based on the findings of present study, the model`s constructs could predict breast self-examination as a health behavior. The results of our study are consistent with findings of Huy's study which indicated IMB model`s constructs predicted using condoms [29].
In present study, there was a significant correlation between education and breast self-examination, however, education has not been reported as an effective predicator in breast self-examination. This result was supported by findings of other studies [30].
The findings of this study did not indicate any correlation between age and breast self-examination. There existed the same situation regarding variables of number of children and marital status. These findings were in accordance with results of Akhtari-Zavare`s study which demonstrated that there were not a significant correlation between breast self-examination and some demographic factors such as age and marital status [14].
The present study has strength points. Firstly, IMB model has been used as a framework in order to perform educational interventions in this study. Secondly, predicting breast self-examination behavior was investigated using IMB model`s constructs in a prospective study. There also have been limitations in our study. This study used samples that approached cultural centers. Therefore, generalizing the finding to whole community is being considered as limitation of this study. Moreover, the lack of control group, the short follow up and not considering information regarding women's predisposition to perform breast self-examination were other limitations of this study.

Conclusions

The results of this study shows that the use of educational interventions based on three constructs of information, motivation and behavior skills can be used to promote breast self-examination.
It is a fact that breast self-examination is a cheap and readily available screening test for breast cancer and a significant percentage of breast tumors are detected by self-examination. As using this method are proposed in some countries by world health organization, the findings of present study can apply to improve breast self-examination among women by health care providers.

Acknowledgements

We would like to acknowledge the help of all the women involved in this research. Also we appreciate the staffs in cultural centers that cooperated for this study.
Funding sources: this research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflict of interest statement

None declared.

Authors' contributions

Study design: MSE and FT and MT. Data collection: MSE. Data analysis: MSE and FT and MN. Study supervision: FT and MT and MN.Manuscript writing and revisions: MSE, FT and MN.

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■ Received on May 12, 2018. Accepted on November 20, 2018.

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