The relationship between breast self-examination and stages of change model in health volunteers

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Abstract

Breast cancer is a major cause of mortality in women. One out of nine women suffers from breast cancer in developed countries. Monthly breast self-examination (BSE) is an important screening activity for early diagnosis of breast cancer. This study was carried out with the aim to identify the relationship between breast self-examination and stages of change model in health volunteers. For this analytical research, 410 health volunteers were selected through cluster sampling. Subsequently and proportionate to cluster size, sampling was conducted. The data gathering tool was a questionnaire based on stages of change model and breast BSE which was completed as self-report by the mentioned volunteers in the health centers. The data was then processed and analyzed by SPSS-16.5. The results revealed that the mean age of the subjects was 34.8+9.3. Regarding the rate and status of predicting breast self-examination through stages of change model; it was found that stages of change model were capable of predicting the stages of change by 54% of breast behavior self-examination. This study confirmed the effectiveness of stages of change model on prediction of breast self-examination among health volunteers of Mashhad, Iran. Moreover, the stages of change model are from the most influential factors on breast self-examination; therefore, it should be reconsidered in design and implementation of educational interventions.

Keywords: Breast Self-Examination, Change Model, Volunteers

Introduction

Breast cancer is a major cause of mortality in women [1]; in that it ranks the 5th cause of death in Iranian women by 4 per 100,000, and ranks 3rd among all cancers [2]. Breast self-examination (BSE) serves to prevent breast cancer and reduce its mortality rates [3], and is an appropriate, efficient and cost-effective method in early diagnosis of breast cancer [4]. Those women who practice this method are able to locate the existing tumors in their breasts in early stages [5]. Researches have found that the BSE is the most essential measure to diagnose the tumor in its early stages i.e. more than 65% of breast lumps are discovered by the patient herself [6]. Despite the efficiency of BSE in decreasing the mortality, studies indicate that it is not common among women.

Numerous studies on female populations in the USA revealed that the rate of practicing BSE among women ranged from 29% to 63%[6]. Similar studies in Canada, Jordan and Thailand reported similar results. Battista's study on Greek women showed that only 12.4 out of all the subjects practiced BSE [7]. Findings of a study in Iran revealed that only 6% of female teachers practiced BSE [5].

Although BSE is the only preventive measure available to women with limited access to medical and clinical care services, just a few practice it, while some women do not know how to perform it at all. There are different factors involved in whether or not to perform BSE [8]. Since health volunteers play a significant role in the promotion of knowledge and attitude in families, they themselves should be well aware of this health measure, to be able to both highlight its importance and even teach it if necessary. Without a plan, health education would be futile or less effective, whereas selecting an educational model will initiate a plan and pursuing it in the right path. The more reasonable theoretical arguments there are to support health requirements, the better the effectiveness of health training and educational plans [9,10].

One of such functional models in health education and promotion is trance theoretical model (TTM), founded by James Prochaska in 1970's. Among the fundamental constructs in this model is the stage of change (SOC), which focuses on comprehension and prediction of health intentions and behaviors. Change processes are the explicit and implicit measures taken by the individual to alter their patterns of emotion, mentality, behavior or overall lifestyle. This model expresses that no one is prepared to take measures of change, or least, not all people are equally prepared to [11].

Change processes propose the time dimension and points out the fact that change happens in course of time. In adapting or changing any health-related behavior, every individual has to go through five stages: the first stage is pre-contemplation, which takes place when the individual thinks of a change in a not-foreseen-future, happening in the next six months. In this primary stage, people fall into two categories: the first are those who know nothing or know little of their behavior consequences, and the second group are those who have had an experience of change, and due to a previous failure, are not seeking any change. This latter category is usually disinterested and rather resistant toward any upcoming changes.

The second stage is known as contemplation and happens when the individual thinks of a change in a foreseen future, yet not immediately and normally within a period of one to six months. Preparation, the third stage, comes along when the individual starts planning for a neat future, mostly including the next month. The fourth stage is action, where the individual has already embarked on significant changes for the past six months [11]. Behaviors are the very actions, and such new actions are clearly witnessed. The individual takes thoughtful and conscious measures for these new actions. The next stage is maintenance, a period during which the individual strives to maintain the behavior usually for six months or so [12]. This model has not been applied in any studies regarding BSE in Iran. Identifying the factors involved in health behavior can influence designing training interventions, and according to change model, any behavior change occurs step by step and needs proper educational interventions proportional to individual's preparedness and supporting them to go through different phases of change [13]. Therefore, the present study was designed to examine the relationship between BSE and stages of change model in health volunteers in Mashhad. The results can be applied to develop and organize educational programs with appropriate strategy in-line with the promotion of the awareness, attitudes and practice of women in the field of BSE and prevention from breast cancer.

Method

This study was conducted in mid May 2012. The study population comprised of 4575 health volunteer participants from Mashhad (North east of Iran) urban areas out of whom 410 people were selected. To promote and model healthy behaviors in society, health volunteers are those who take the necessary health trainings, acquire health skills and manners and transfer or communicate their learning to at least 50 other households. Their efforts are meant to change people's attitude and practice with regard to their potential abilities in enhancing life conditions along with preparing the grounds for a more active participation of participants in economic and social development in the country [12]. In this study, cluster sampling method was applied, in that each of health centers 1, 2, 3, 4 and 5 in Mashhad was considered as a cluster. From each of these clusters, 5 health centers were randomly chosen, then and proportionate to the volume of that cluster, the participants were selected.

In order to observe moral ethics, the objectives and the nature of this study was described to the participants, and prior to their completion of the questionnaire, they signed consent form. The inclusion criteria were personal tendency to participate, minimum 20 years of age, and being Iranian. The exclusion criteria were being under 20, history of mental or physical diseases, a record or history of breast problems and diseases, and failure to sign the consent form. Based on the studies by Blanks-Peyser [13] participant size was estimated 397 with consistency between self-efficacy and the behavior score of 14%, the confidence interval of 95%, and the power of 80%. The participant size was increased to 410 to increase the accuracy. The research tools included a questionnaire adopted from stages of change model, also some questions assessing BSE, and demographic information such as age, gender, marital status, formal education years. The questionnaires were filled out by the participants as self-report.

The content and face validity of the questionnaire were verified by a panel of experts. The questionnaire was developed after studying books and similar publications, and summing up the themes from the interviews held with gynecologists. Then and for further modification and correction, it was submitted to 75 professors, field experts and professionals in health education, reproductive health and gynecology, 13 of who returned their viewpoints and feedback. Content Validity Index (CVI) calculates the three criteria of relevancy, specificity and clarity by Likert scale (totally relevant (4), relevant (3), partially relevant (2) and irrelevant (1)). The content validity was calculated through having the number of specialists (agreeing with an item with points 3 and 4) divided by the total number of specialists. If the score for CVI gets above 79%, it is regarded fit. In this study, the score for the stages of change model reached 84%. Moreover, for Content Validity Ratio (CVR), the necessity criterion was referred to as necessary, useful but not necessary, and not necessary, and calculated by the total number of specialists who chose "necessary" subtracted from half of the total assessments, divided by half of the total assessments. In this study, the CVR for stages of change model was 84%, where, according to Lavashe [14] Table, the lowest needed score is 62%. To determine the internal consistency of the questionnaire, some preliminary studies were done on 60 individuals. Also to figure out the test stability on stages of change model a consistency coefficient was utilized with an amount for 9%.

A SOC model was assessed with one question. The poll was testing this statement "at the moment, which statement would you choose for BSE". There were five answers highlighted: 1) I never did BSE and never intend to (pre-contemplation); 2) I intend to practice BSE regularly during the next six months (contemplation); 3) I intend to practice BSE regularly during the next month (preparedness); 4) I am practicing BSE regularly for the past month (action); 5) I have been practicing BSE regularly for the past six months (maintenance). Response to this question was rated on Likert scale from never to a lot. Thus the achievable span of scores was 1 to 5 here. As for behavior assessment, there were four questions

applied on BSE. These questions were adopted from Champion BSE questionnaire (CHBMS) designed in 1984 for international applications and revised in 1997 and 1999 [14]. The reliability of this tool has been evaluated in various populations [15,16]. After collection, the data were entered into SPSS software, version 16.5. To further analyze the information, Pearson & Spearman one way ANOVA correlation coefficient were applied together with a linear regression. The significance level was 0.05.

Results

In this study, subjects' mean age was 34.7+9.4 years. The most age group was 30-34 years (20.7%). In total, 36.8% mentioned a history of breast cancer in relatives and acquaintances. The majority (93.9%) of subjects did not mention a record of breast diseases, but the most common condition among those with a history was breast pain (1.4%) Table 1.

Frequency distribution and percentage of specifications of people Based on SOC model (Table 2).

Spearman coefficient correlation indicated a significant relationship between the stages of the change model and BSE (P<0.001 & r=0.54). It could be argued the stages of change model could predict the BSE by 54%. An extended linear regression model was applied in analyzing the influence of marital status or any previous experience of contact with breast cancer relatives and acquaintances on stages of change model over BSE. Results are shown in Table 3. The ANOVA test revealed that there was no significant relationship between age and stages of the change model in BSE (P<0.05). Likewise, there was no significant relationship noticed between stages of change model and education level using Chi-square test (Table 4).

A significant relationship was observed between marital status and stages of change model using the Chi-square test in that married participants showed more tendency to adopt change and practice BSE (P<0.05).

Table 1 *Frequency distribution and percentage of specifications of females in the study (n=410)*

		Frequency	
		N	**%**
Age group (years)	20 or below Age	16	9.3
	24-21	44	7.10
	29-25	65	9.15
	34-30	85	7.20
	39-35	80	5.19
	44-40	64	6.15
	45 and above	63	4.15
Education	Elementary school	77	8.18
	Middle school	99	1.24
	High school dropout	199	5.48
	High school diploma and higher	35	5.8
Marital status	Never married	50	2.12
	Married	347	6.84
	Widowed	7	7.1
	Divorced	6	5.1
Occupation	Employed	24	9.5
	Housewife	386	1.94
Percentage of participants' report of meeting people with breast cancer among friends and acquaintances	Positive	151	8.36
	Negative	259	2.63

Table 2 *Frequency distribution of participants based on (SOC)*

	N	%
Pre-contemplation	51	5.12
Contemplation stage	77	8.18
Preparation stage	133	4.32
Action	47	5.11
Maintenance phase	102	9.24
Total	410	100

Table 3 *Generalized linear regression model and factors influencing BSE*

Variables	β	T	P-Value
Single	0.322	1.2	0.22
Married	0*	-	-
Previous experience of meeting breast cancer patients	0.16	0.9	0.36
Having no previous experience dealing with people with breast cancer.	0*	-	-
Age	0.001	0.067	0.94
Pre-contemplation	-3.3	11.6	0.001
Contemplation stage	-1.2	8.4	0.001
Preparation stage	-1.3	6.1	0.001
Action	0.05	0.19	0.8
Maintenance phase	0*	-	-

* The base is considered

Table 4 *Comparison of SOC model in the people studied based on demographic variables*

Stages of change		Pre-con-templa-tion	Contemplation	Prepara-tion	Action	Maintenance	P-Value*
Education	Elementary school	14	11	18	11	23	
	Middle school	16	22	32	8	21	0.13
	High school & above	21	44	83	28	58	
Marital status	Single	14	14	15	9	11	0.039
	Married	37	63	118	38	91	
Percentage of participants meeting people with breast cancer among friends and acquaintances	Positive	18	33	54	8	38	
	Negative	33	44	79	39	64	0.04
	Total	51	77	133	47	102	

* Chi-squar test

Discussion

Results of this study revealed that a direct relationship exists between stages of change model and BSE so that the stages of change model could predict BSE by 54%. In this study, 12.5% of participants were in per-contemplation stage and did not have BSE on mind. According to stages of change model on BSE behavior, in pre-contemplation stage, participants found the advantages of not

practicing BSE more than its disadvantages, thus stop at this stage. Of course this could result from unawareness of the adverse consequences of not practicing BSE, or related to their frequent failures in properly practicing BSE. Meanwhile, encouragement and awareness raising concerning BSE and risks of breast cancer would enable them to move forward onto the next behavior stages.

In the current study, 46.1% of the participants knew the appropriate time for BSE, and 68.8% of participants knew the appropriate intervals for doing BSE, which was in line with the study by Nourizadeh et al[19], in which 20.1% of participants knew the appropriate time for BSE, and 37.9% of participants knew the appropriate intervals for doing BSE. Also, in a study by Banaian et al [18]., 16.5% knew the frequency of BSE and 25.3% were aware of the pains involved in doing the examination. In a similar study in Australia, 31% of women practiced BSE monthly and on a regular basis [19]. In this research, physicians and healthcare staff were the main source of information for the participants regarding the disease and its screening methods. In the study by Nourizadeh et al [17]., physicians, healthcare staff and health posters were the most important sources of information for the participants by 35.6%. In the study by Yavari et al, [20]., the share of the doctors and healthcare staff was reported 27% as a source of information for disease-free women. Banaian et al, [18]. reported that among the educational resources, health centers played the most prominent role by 3.5%.

In this study, there was no relationship between age and knowledge score, which is in line with another study by Godazandeh et al [21]., where there was a higher probability that women above 20, with more advanced education were less informed of the preventive breast cancer programs. Contrary to our findings, the study by Nourizad [17] showed that the older the individual, the more learned and aware she would get regarding the disease and screening methods.

In 2005 and in a survey with 204 participants, titled "Application of health behavior model and trans-theoretical model in practicing BSE", Collins concluded that most participants were in pre-contemplation stage (31%), in contemplation stage (27%), in preparation stage (15%), in action stage (9%), and in maintenance stage (7%). Whereas in the current study, there were more participants in the pre-contemplation stage (51%) and less in contemplation stage (18.8%) [22]. Despite the previous findings in favor of a relationship between screening behaviors and a history of breast cancer in relatives and acquaintances, such a relationship was not traced in the current study as mentioned in an earlier reference [17,21]. Similarly, in a study by Collins, 42 women (72%) reported a history of breast cancer in their relatives and family, while 164 people (64%) reported no history of breast cancer in their relatives and family. The Chi-square test did not reveal a significant difference between BSE with a history of breast cancer among relatives, and females without a history of breast cancer history in relatives or family ($\chi 2= 1.378$, $P<0.05$) [22].

Meanwhile, Nourizad [17] quoting Banaian's study [18] reported that personal history and relatives' history with breast cancer are the two most influential factors on knowledge and practice relating to breast cancer screening. Courneya et al [23]. in their study titled "application of stages of change model on adopting sporting behavior" with 519 participants from Scotland school students, found out that most of them were in pre-contemplation, contemplation and preparedness stages. In our study, they were mostly in preparedness stage. This highlights the fact that the majority of participants were looking forward to doing BSE, which is a pleasant point to know. Graham et al [24]. reported a more significant impact for health beliefs on behavior, being much more influential than demographic features.

In another study by Henderson et al. titled "Application of stages of change model", on 214 women aged 14 to 76, the results showed that age was a predictive factor in

stages of change model. In addition, for other stages of change model, most women were unable to detect a tumor in their breast except in maintenance stage, where fewer women were likely to detect breast tumors [25]. This finding was also verified in the current survey. Finally, it must be mentioned that one of the most important issues in breast cancer screening and health concepts is the cultural and intra-cultural varieties. Seemingly, disobedience toward healthy behaviors exists in every society since correct and incorrect health behaviors comprise part of that given culture. Consequently, to better prepare individuals for following a healthy lifestyle so as to safeguard their own health and prevent diseases, they need to develop specific health behaviors and receive appropriate health trainings to support such behaviors [26]. In this manner, it seems that a SOC model is able to serve as an outstanding model in description and analysis of BSE.

Conclusion

The findings of this study confirms the effectiveness of stages of change model on prediction of BSE behavior among health volunteers from Mashhad, accordingly, a remarkable majority of the study population were in pre-contemplation and contemplation stages, who were not intending to do BSE in near future. Therefore, this could be utilized as a model framework in planning and implementing training programs aiming to promote women's health status, and to decrease breast cancer mortality rate. Accordingly, it is advised that any training intervention be developed in accordance with stages of change model to promote BSE.

Collecting information on BSE behaviors through self-report was of this study limitations, where the accuracy decreases, but we cannot alleviate this limitation. Additionally, the cross-sectional nature of this study is another limitation. To exactly determine the influence stages of change model on BSE behavior, it is recommended that some study interventions be designed and carried out in an interventional manner.

Conflict of Interest

"The authors declare that they have no competing interests".

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