

Application of Health Belief Model in Prevention of Breast Cancer among female staffs of Islamic Azad University-Tonekabon branch in Iran

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Abstract: Background and Objectives: Nowadays, malignancy is considered as one of the most important health burden in the world. In this study, with respect to the importance of training in order to promote preventive behaviors, the application of a training program based on health belief model was surveyed. A semi-experimental study was conducted on 100 female staffs of Islamic Azad university-Tonekabon branch, Mazandaran, Iran. Samples were randomly collected and classified as intervention (case) and control groups by interviewing using a health belief model-based questionnaire. Both groups completed the questionnaire twice within a three months period of time before and after training of intervention group. Data was analyzed by statistical tests and SPSS software (versions 11.5 and 16). Based on results obtained by this study, two groups had no significant difference in terms of demographic variables. However, a significant difference was observed among scores of different constructs of this model such as perceived severity, benefits, and barriers before intervention, and scores of knowledge, attitude, perceived benefits and barriers, and act guidance after intervention ($p < 0.05$). The findings of this study imply that the present HBM based intervention has had a positive effect on increasing women's knowledge, attitude, and behaviors regarding breast cancer.

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1. Introduction

Malignancy is currently considered as one of the most important health problems in the world (Ebrahimi, 2007). Cancer includes more than 200 different diseases, all involved in malignancy (NCDC, 2004). Breast cancer has become the third cause of mortality and the second group of non-infectious chronic diseases among the women all around the world, so that every one out of eight women will develop this disease during her lifetime. However, this cancer is possible to be prevented or treated in many cases (Ghaem Maghami F, 1998). The prevalence of this cancer in Iran is estimated to be 17.1%, which comprises 33% of all women's cancers and 19% of their cancer mortality. Around 57% of Iranian patients are diagnosed at second stage of cancer, 25% at third stage and only 18% at first stage. However, in developed countries, patients are mostly diagnosed at the first and second stages (<http://pezeshk.breastcancer.com>). It is estimated that 90% of breast masses are detected by women's self-examination, of which 20-25% are malignant (Sadegh Nejad F 2001 5). The prevalence of breast cancer has been increasing during the past two decades. Researchers in the USA Cancer Institute have addressed it to the changes in impregnating

models such as late pregnancy and having fewer children (Ghaem Maghami F, 1998 3). Fear, anxiety, shame, and lack of training are considered as the important factors that restrain women to do breast self-examination (Nustas W, 2002; Bostick RM, Sprafka JM, Virjin BM, 1993). A study done on 600 female staffs of schools located in the city of Tehran showed that breast self-examination training has a significantly positive effect in early detection of masses and increasing health beliefs in all levels ($p < 0.001$) (Tahvildari S, 2005). Since breast cancer threatens women's health, a research priority has been given to it by the health authorities in different countries including Iran. However, due to the cultural environments in countries like Iran, it is not possible to use media to train women regarding early diagnosis of this disease. Therefore, it is necessary for authorities to introduce broad training programs for secondary prevention. The importance of secondary prevention is highlighted as the early prevention opportunities are limited. On the other hand, regarding the need of public to be trained, training of breast cancer can play an important role in prevention. Nevertheless, due to lack of knowledge regarding all different factors that influence breast cancer, introducing different aspects of disease to the

public with emphasizing on the training for self-examination would play an important role in prevention and on time diagnosis (Porzand A, 1998). Hence, surveying the level of public knowledge, their beliefs, and behaviors in any population would have an important role in designing programs for troubleshooting of health training in society (Ebrahimi, 2007). On the other hand, screening methods can be used as alternative to accomplish early prevention and decrease mortality. Nevertheless, despite attempts, 20-60% of women do not concur with screening methods (Ghaem Maghami F, 1998). Also, in spite of enlightening of women regarding the importance of early diagnosis of breast mass or any unusual symptoms and encouraging them to do self-evaluation examinations, yet more than 20% of women refer to doctor with an advanced level of breast cancer (Love S, 1998). The first stage in health training is to enhance public knowledge regarding prevention methods to improve their health (Shojaee Ji Tehrani H, 1999). Health Belief Model (HBM) is widely used in the framework of anticipated studies of health-related behaviors (shojaezadeh D, 2000). It is a broad method that concentrates more on prevention than control, even though in secondary prevention, it more focuses on control of disease. Therefore, according to this model, a person goes through a health action only when he/she understands the threat, susceptibility, severity of disease, and health value of that action. (shojaezadeh D, 2000). This study aimed to investigate the effect of the HBM on enhancing knowledge and improving attitude and performance of women against breast cancer. Similar research done by Oyewopo et.al (2011), Jourkeshet.al (2011), Ashour et.al (2011) and Abd El-Aziz et.al (2011).

2. Material and Methods

A semi-experimental case-control study was conducted on 100 female staffs of Islamic Azad University-Tonekabon branch located in Mazandaran province, Iran. They were classified as intervention (case) and control groups each including 50 individuals. A questionnaire was used as data collection tool. The questionnaire was compared with the authentic references and its validity was confirmed by the health science experts at university of Tehran. To complete the questionnaire, all participants were interviewed based on health belief model. The interview took place twice within a three months period of time before and after training of intervention group. The questionnaire included three sections. The first section was related to the demographic data (table 1); the second to measure the knowledge of participants regarding breast cancer

and its prevention by screening methods; and third to determine their attitude toward breast cancer based on the health belief model (table 3). After completing the first questionnaire by all participants, the intervention group was divided to four subgroups each including 7-15 individuals and three collective discussions were conducted among them with training purposes under supervision of the researchers. Each session lasted three hours and the auxiliary training tools included film, moulage, and pamphlet. All participants were interviewed again to fill up the questionnaire three months after the first interview. The parameters were classified in two clusters and compared by paired-*t* test, while others were classified in three clusters and compared by one-side variance analysis. All results were analyzed by SPSS software (versions 11.5 and 16) (table 1).

3. Results

The demographic data obtained by this study is shown in table 1. The knowledge and HBM model were first compared by independent test before and after training in both case and control group, which showed significant association ($p < 0.01$) (table 3). The comparison of all scores before training showed no significant association between case and control groups except those for perceived benefits, perceived barriers and severity ($p < 0.05$) (table 4). However, all scores except perceived susceptibility and severity showed significant association between control and test groups after training ($p < 0.05$) (table 5). For surveying the relationship between demographic factors with level of knowledge and attitude of subjects toward breast cancer, two clustered and three clustered parameters were measured by pair-*T* test and variance analysis, respectively. These parameters were specified as the most important factors influencing breast cancer ($p < 0.001$) (table 2).

4. Discussions

This study evaluated the level of knowledge and attitude of female staffs of a university toward breast cancer based on Health Beliefs Model (HBM). Some parameters including age, marital status, education status, house owning, level of income, being believe in milking, records of breast cancer among family and relatives, and being affected of the participant were used to compare case and control groups before and after training (table 1). Improvement in level of knowledge and attitude toward breast cancer in the framework of HBM has a positive effect on preventive behaviors in women. The findings of our study confirmed that the HBM-based program positively affects the susceptibility, severity, and perceived benefits and barriers, and act guidance. This study showed that the mean scores of

knowledge and preventive methods were significantly higher in cases than controls both before and after training ($p < 0.001$) (table 3). These results are consistent with those obtained by some other researchers. The research performed by Rahmati showed that the mean scores of knowledge and preventive methods achieved by cases were higher than average ($p < 0.001$) (Rahmati Najar Kaliaee F, 2002). The study done by Hee-Soon Ivon (2006) on Korean women showed that intervention group had an increased level of knowledge about breast cancer after training in compare to control group (Hee- Soon Ivon PHD A , 2006). The higher level of knowledge is in direct relation with early diagnosis and increasing the chance of treatment being more effective. Since having knowledge about a topic is a prerequisite to decide for the correct attitude and suitable behavior regarding that topic, having knowledge about breast cancer can help in early diagnosis of this disease at first stages and increase the life duration of infected women (Harris R , Leininger L , 1995). The finding of this study confirms that the HBM-based program positively affects the susceptibility, severity, perceived benefits and barriers, and act guidance of case group. Studies done by some other researchers have shown that women avoid self-examination due to some reasons including disbelieving, forgetting, fear, and husband's disagreement (Bostick RM ,Sprafka JM, Virning BA ,Potter JD ,1993 ;Manfredi C, Warnecke RB, Graham S ,Rosenthal S,1997;Thomas EC, 2004).Based on the study done by Jahangardies, 60.5% of subjects had primary and intermediate education, and their level of knowledge about breast cancer was affected by their level of education (Jahangiri L ,2007). The mean scores of two groups measured in their study also showed significant relationship between perceived benefits and preventive methods before and after training ($p < 0.001$) (table3). In study done by Jahangardies50.5%of subjects a chieved higher mean scores for perceived benefits after training ((Jahangiri L ,2007). In the study done by Georrgiar Salder regarding perceived benefits as a determinant factor in applying preventive methods, 94% of women agreed with the early detection of breast cancer (Salder GR , Dhanjel SK , Shah NB , KO C Anghel M , 2001).In our study, the mean scores of susceptibility toward breast cancer and preventive methods showed significant association in both case and control groups before and after training ($p < 0.001$) (table 3). Our results also showed that subjects had a higher susceptibility toward expected matter, while concerning factors of cancer were different and unclear in some cases (Breast Cancer International Research Group, Jornal, 2007). The

study done by Rahmati (2002) showed that case group achieved a high score in perceived susceptibility toward breast cancer (Rahmati Najar Kaliaee , 2002). This result emphasizes on the need of increasing knowledge to better perform preventive methods in breast cancer.The susceptibility of intervention group was effective in adopting preventive behaviors, and successful prevention depended on data of personal susceptibility and its risk in every individual .In addition, perceiving severity of disease and its symptoms and results were of the main components of the health belief model (HBM), which were effective in adopting preventive behaviors.The surveying of mean scores of perceived barriers showed a significant relationship between breast cancer and its methods in both case and control groups before and after training($p < 0.001$) (table 3). The factors preventing self-examination included fear, anxiety, shame and lack of skill about how to do it correctly (Nustas W ,2002 ; Bostick RM , Sprafka JM ,Virjin BM ,1993). It is important to notice that perceived barriers are considered as the key component of health belief model, as it can be used to predict the person's performance. It is also considered as an important factor in acquiring preventive behaviors and in reducing barriers by increasing knowledge. The authentic and successful prevention depends on the information of barriers (Theory At a Glance ,Seconde Edition). The findings also showed a significant difference between mean scores of perceived severity before and after training in intervention group ($p < 0.001$) (table 3). In study done by Jahangardi, the mean score of problem severity increased after training. In this study, a statistically significant increase in mean score of problem severity was also observed in intervention group ($p < 0.001$), while no significance was seen among control group (Jahangiri L ,2007). In her study, the mean scores of act guidance increased after training (Jahangiri L ,2007). The findings of our study also showed a significant relationship between mean scores of act guidance in female staffs before and after training in both intervention and control groups ($p < 0.001$) (table3). Since this parameter considers health staff as data source, it seems that these staff can play an important role in education of society regarding the prevention of cancer. Health personnel can have an effective influence on people who refer to them. These results are consistent with those studies which have classified health personnel and media as the first and second priority in education of society, respectively (Jahangiri L ,2007). However, Dundar and Ozmen showed that, as a source of education, media including Radio and Television are prior to the health personnel and doctors ($p < 0.001$) (Dundar, Ozmen,2006). Degree of

correlation between conceived benefits with the women who had or had not record of breast cancer among their family in case group was significant both before and after training, while in control group it

was significant only before intervention ($p < 0.001$) (table2).

Table 1. Demographic data of cases and control groups of studied female staffs of Islamic Azad University-Tonekabon branch .

kind	groups	Case	Percentage	Control	Percentage more	P- valu
Age(30-20) (40-31)(>40)	(3groups)	agemoreof41	58%		50	$p < 0/001$
underdiplom Diploma University	(3 groups)	UniversityEducation	78%	31-40 Education university	90%	$P < 0/001$
Dead Marriage Not marriage Without hausband	(4groups)	Marriage	78%	Marriage	88%	$P < 0/001$
having Hause not having Hause	(2groups)	Hausing	90%	Hausig	82%	$P < 0/001$
Believeinmilking(not) (Mide) Have Very more	(3groups)	(verymore)	74%	Believein milking(very more)	78%	$P < 0/001$
Having Or not	(2groups)	Breastcancer persons	94%	Breast cancer in persons	92%	$P < 0/001$
(not) near their relative very their relative not near	(3groups)	breastcancer in their relative	78%	breast cancer intheir relative	74%	$P < 0/001$
(300 -500) 700-500 >700	(3groups)	income	46%	income	66%	$P < 0/001$

Table 2. Comparison between mean scores of different parameters based on their significance among trained and untrained female staffs of Islamic Azad University-Tonekabon branch .

Dependent variable	variable	P-value
Perceived benefits after intervention (case)	Having breast cancer or not	$P < 0/05$
perceived Severity after intervention (case)	education	$P < 0/05$
Perceived benefits after intervention (control)	education	$P < 0/05$
Perceived Severity before intervention (control)	marriage	$P < 0/05$
Knowelge after intervention (case)	breast cancer in their relative	$P < 0/05$
Perceived benefits after intervention(case)	breast cancer in their relative	$P < 0/05$
Attitude intervention befor and after(control)	breast cancer in their relative	$P < 0/05$
Perceived barrier intervention after(control)	breast cancer in their relative	$P < 0/05$
Act guidance before(control)	income	$P < 0/05$

Table 3. Comparison between mean and standard deviation of different parameters before and after applying of HBM among trained and untrained female staffs of Islamic Azad University-Tonekabon branch.

	knowelge		Attitude		Perceived benefits		barrier Perceived		Perceived susceptibili ty		perceived Severity		Act guidance	
	case	witn ess	case	witn ess	case	witn ess	cas e	witn ess	cas e	witn ess	case	witn ess	case	witn ess
Before	8.64	8.80	33.8	33.5	9.88	10.5	4.9	4.42	5.0	4.44	8.74	9.92	9.30	9.28
Mean	0	0	00	60	0	60	00	0	80	0	0	0	0	0
Standard Deviation	2.50	3.27	4.39	4.93	1.82	1.29	1.3	1.66	1.5	1.21	2.55	2.14	2.83	2.61
After	19.2	8.82	47.3	42.3	14.4	11.0	5.6	5.08	6.3	4.98	10.3	10.4	15.6	18.1
Mean	60	0	00	80	60	60	00	0	40	0	00	82	80	00
Standard Deviation	2.71	3.29	3.64	4.86	1.85	1.09	1.6	1.27	1.2	1.15	1.71	1.59	1.97	2.47
Meaningful Comparison Before And after	P<0.001		P<0.001		P<0.001		P<0.001		P<0.001		P<0.001		P<0.001	

Table 4. Comparison between all scores before applying HBM model among trained and untrained female staffs of Islamic Azad University-Tonekabon branch.

Before	grops	N	mean	sdt	F	t	df	Sig. (2- tailed)
Knowelge	Case	50	338000	4,39387	.187	.257	98	.798
	Control	50	335600	4,93699				
Attitude	case	50	86400	2,50518	2.121	-.275	98	.784
	Control	50	88000	3,27015				
Perceive d benefits	case	50	98800	1,82544	6.706	- 2.148	98	.034
	Control	50	105600	1,29615				
Perceive d barrier	case	50	50800	1,52315	1.799	2.323	98	.022
	Control	50	44400	1,21487				
Perceive d suscepti bility	case	50	49000	1,35902	1.703	1.578	98	.118
	Control	50	44200	1,66709				
perceive d Severity	case	50	87400	2,55399	1.715	-2.501	98	.014
	control	50	99200	2,14609				
Act guidance	case	50	99200	2,82301	.160	-.037	97.453	.971
	Control	50	99200	2,61893				

Table 5. Comparison between all scores after applying HBM model among trained and untrained female staffs of Islamic Azad University-Tonekabon branch

after	grops	N	mean	sdt	F	t	df	Sig. (2- tailed)
Knowelge	Case	50	47.3000	364356486927	1.251	5.721	98	.001
	Control	50	42.3800					
Attitude	case	50	19.2900	2,716623.29310	3.139	17.293	98	.001
	Control	50	8.8200					
Perceived benefits	case	50	14.4600	185395	17.731	11.164	98	.001
	Control	50	11.0600					
Perceived barrier	case	50	6.3400	1.20560	.063	5.768	98	.001
	Control	50	4.9800					
Perceived susceptibility	case	50	5.6000	1.69031	8693	1.737	98	.086
	Control	50	5.0800					
Severity	case	50	10.3000	1.17172	.156	-.543	98	.588
	control	50	10.4800					
Act guidance	case	50	15.6800	1.97370	1.416	-5.404	98	.001
	Control	50	18.1000					

Table 6. Descriptive statistics of mean scores and standard deviations of HBM model among case and control women studied in Islamic Azad University-Tonekabon branch in the year 2010.

case	control							sig	
Before and after intervention	upper	Lower	Std.	Mean	Upper	Lower	Std.	mean	
knowelge before	9.3520	7.9280	2.50518	33.8000	9.7294	7.8706	4.93699	8.8000	.78
knowelge after	20.0321	18.4879	2.71662	47.3000	9.7559	7.8841	4.86927	8.8200	.001
Attitude before	35.478	32.5513	4.39387	8.6400	34.9631	32.1569	3.27015	33.5600	/798
Attitude after	48.3355	46.2645	3.64356	19.2600	43.7638	40.9962	3.29310	42.3800	/001
Perceived benefits before	10.3988	9.36121	1.82544	9.8800	10.9284	10.1916	1.29615	10.8600	034/
Perceived benefits after	14.9869	13.9331	1.85395	14.4600	11.3714	10.7486	1.09563	11.0600	000/
Conceived barriers before	5.5129	4.4671	1.52315	5.0800	4.7853	4.0947	1.21487	4.4400	022/
Conceived barriers after	6.6826	5.9974	1.20560	6.3400	5.3073	4.6527	1.15157	4.9800	/001
Conceived sensitivity before	5.2862	4.5138	1.35902	4.9000	4.8938	3.9462	1.66709	4.4200	/118
Conceived sensitivity before Problem	6.0804	5.1196	1.69031	5.6000	5.4424	4.7176	1.27520	5.0800	/086
intensity before	9.4658	8.0142	2.55399	8.7400	10.5299	9.3101	2.14609	9.9200	/014
Soverity after intervention	10.7880	9.8120	1.71726	10.3000	10.9330	10.0270	1.59387	10.4800	/588
Act guidance before	10.1023	8.4977	2.82301	9.3000	10.0243	8.5357	2.61893	9.2800	/971
Act guidance after	16.2409	15.1191	1.97370	15.6800	18.8038	17.3962	2.47642	18.1000	/001

According to the study done by Rahmati (2002), 29.3% and 11.1% of subjects had positive record of disease among their family members and relatives (Rahmati ,2002), respectively; while in

study done by Banayan ,1.5% of subjects pointed to have breast cancer patients among both their family members (either sister or mother) and relatives(Banayan ,2005). The relationship between

scores of severity and level of education showed significant association in case group after training ($p < 0.001$) (table 2), while significant correlation was observed between scores of perceived benefits after training in control group ($p < 0.001$).

In the study done by Parsaee (2001) regarding the effect of education on prevention of breast cancer, 47.2% of participants were uneducated and showed that the level of education has a significant effect on prevention of breast cancer. This study showed a meaningful relationship between knowledge and the importance of training in creating severity ($p < 0.001$) (Parsaee, 2001). Our study also showed that the level of education has high effect on perceived severity ($p < 0.001$) (table 2). This study also showed that perceived severity is affected by level of education which is consistent with the study done by Jahangardi ($p < 0.001$) (Jahangiri L, 2007). Also, a significant correlation between scores of perceived severity and marital status was observed before training in control group ($p < 0.001$) (table 2). In a study done by (Hubbel FA, Mishra SI, Chavez LR, Valdez RB, 1995) mammography was applied on 430 women and marriage was considered as an effective factor. However, this factor showed no significant association in our study (Hubbel FA, Mishra SI, Chavez LR, Valdez RB, 1995). Correlation between perceived severity score was significant in groups who were believe in milking before training in control group, while this factor showed no significant association in other group. The scores of knowledge and perceived benefits showed significant relationship after training in case group with having record of breast cancer in relatives ($p < 0.001$) (table 2); while the score of attitude showed a significant association before and after training in control group with record of breast cancer in relatives. In this study, 78% of case group and 74% of control group did not point to have any record of breast cancer in their family, while 20% of case group had breast cancer among their both close and far relatives, 10% of controls had the disease among their close relatives, 20% among their far relatives, and 16% among their family members. In Jahangardi's study, number of persons with record of disease among family members in case group was eleven, of which one, three, and seven of them were pointed to mother, aunt and other relatives, respectively, that was not statistically significant (Jahangiri L, 2007). In Banaian's study, 1.5% of participants pointed to have disease among their family members (sister and mother) (Banaian, 2005) and a meaningful relationship was observed between mean scores of attitude and perceived severity before intervention as well as scores of perceived severity with house owning situation after intervention in

control group ($p < 0.001$). However, no groups showed meaningful relationship with house owning situation in our study. The results of current study showed that the training program designed for female staffs of Islamic Azad University-Tonekabon branch and performed during a three months period of time had a significant influence in their preventive behaviors against breast cancer. According to these results, it can be stated that training programs can improve the preventive behaviors toward breast cancer.

A training program was designed based on health belief model to evaluate the efficacy and efficiency of this model in improving preventative behaviors toward breast cancer. The study conducted on female staffs who were working in a university in northern Iran. The results of our study showed that this program had a positive influence on knowledge, attitude and performance of women regarding prevention of breast cancer. It seems that publicizing of this program will decrease the costs of public health in a country like Iran.

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