

THE EFFECT OF AN EDUCATIONAL INTERVENTION BASED ON HEALTH BELIEF MODEL ON MAMMOGRAPHY SCREENING STAGE OF CHANGE IN WOMEN 40 YEARS OF AGE AND OLDER, ISFAHAN, IRAN

© Mitra MOODI

(Isfahan University of Medical Sciences, Isfahan, Iran)

Mitra_m2561@yahoo.com

© Gholam-Reza SHARIFIRAD

(Isfahan University of Medical Sciences, Isfahan, Iran)

© Mohsen REZAEIAN

(Rafsanjan University of Medical Sciences, Rafsanjan, Iran)

© Firoozeh MOSTAFAVI

(Isfahan university of Medical Sciences, Isfahan, Iran)

Received: 31.07.2012; Accepted: 26.11.2012; Published online: 27.05.2013

Educational programs play an important role in promoting breast cancer screening behaviors. Also, Stages of Change and Health Belief Models are the most common models have been applied in Mammography screening behaviors. So, the purpose of this study was to determine the effect of BC screening education using HBM on stage of change of mammography screening behavior in 40 years women and older. In this Population- based controlled Trial, 290 women 40 years and older were divided into experimental and control groups randomly. Mammography screening behavior determined using the Rakowski stage of change measure and HBM components were determined by Farsi version of Champion's Health Belief Model scale (CHBMS). Questionnaires were completed before and three months after intervention. Four educational sessions were conducted each session lasting 90 by lecturing, group discussion and showing slide & educational film based on HBM constructs. The obtained data were analyzed by SPSS (version 18) and statistical test at the significant level of $\alpha = 0.05$. In the experimental group, stage of change after intervention had a significant positive progress ($p < 0.001$). Mean scores of perceived susceptibility, perceived benefits, perceived barriers, perceived self-efficacy and health motivation in the experimental group had significant difference in comparison with the control group ($p \leq 0.001$). The results of this study have confirmed the efficiency of educational intervention based on HBM in improving mammography screening stage of change. Hence, implementing appropriate educational programs with focus on benefits of Mammography in early detection of BC and creating positive motivation for health among women, can increase their adherence and transition into action and maintenance stages.

Keywords: Breast cancer, Mammography Screening, Education intervention, Stage of change model, Health Belief Mode

Breast cancer is a major health challenge in the world over. It's the most commonly cancer and a leading cause of death among women. Breast cancer incidence rate is rapidly increasing especially in developing countries (Seedhom & Kamal, 2011; Sim, Seah & Tan, 2009). During the last 30 years, the incidence of breast cancer has doubled in Iran (Babu et al., 2011) and is now ranked as the first among diagnosed cancers in women (Kolahdoozan et al., 2010). Therefore, it is one of the most important women's health problems in Iran and should be managed with preventive and screening measures.

Screening prevention plays an important role in early detection of breast cancer and decreasing its mortality rates. The recommended screening approaches for early diagnosis of breast cancer are mammography, clinical breast examination (CBE) and breast self examination (BSE) (Gursoy et al., 2009; Alters & Wendy, 2009). Both the Iranian Ministry of Health and Medical Education and the American Cancer Society (ACS) recommended annually mammography screening in their guidelines for early detection of breast cancer (Mousavi, 2008; American..., 2012).

Annual mammography screening is the best technique to discover tumor before signs and symptoms appear and can prompt effective treatment (American..., 2012; Farmer et al., 2007). Also, the ACS recommended that women should become inform about the benefits, barriers and potential harmful of regular screening (Canbulat & Uzun, 2008). Iranian ministry of health aims to increase mammography use among women aged 40 years and over for early detection of breast cancer. Research findings showed that delay in presentation of breast cancer in developing countries, like Iran was contributed to low knowledge level, lack of screening program, lack of educational program, late and poor access to health care facilities (Seedhom & Kamal, 2011; Babu et al., 2011).

Studies revealed that behavior-based interventions can help women overcome their personal barriers, encourage them to seek mammography screening and maintain regular mammography screening behavior (Russell et al., 2010; Lin & Effken, 2010; Kim et al., 2010). The Health Belief Model (HBM) is one of the models that widely used as a guiding framework for health behavior interventions, especially mammography screening behavior (Glanz et al., 2008). Therefore, in this study the HBM has been applied as the theoretical framework to develop an educational intervention about mammography screening and evaluate effects of education on knowledge and health beliefs.

The HBM is a psychosocial model which originally developed in 1950s and updated in the 1980s (Moodi et al., 2011). According to HBM, women will be more to perform mammography screening behavior if they feel susceptible to breast cancer (perceived susceptibility), believe breast cancer is a serious disease (perceived severity), perceive more benefits from mammography with regard to mammography barriers, have higher confident for obtaining mammography and receive a cue to action (Glanz et al., 2008; Gozum et al., 2010).

Studies have indicated that perceived susceptibility and severity are associated with enhance of breast cancer knowledge and perceived benefits and barriers have the positive correlation to behavior change (Champion et

al., 2006; Garza et al., 2005). Thus, appropriate educational interventions can promote women knowledge level, change their attitude and health belief about breast cancer and mammography screening and finally effects on their performance toward mammography use. Although women's knowledge and health belief of breast cancer screening behavior have been studied in Iran and few educational interventions undertook to increase knowledge, health belief and behavior of mammography use (Moodi et al., 2011; Hadizadeh-Talasaz & Latif-Nezhad, 2004; Ghanbari & Atrkar-Roshan, 2004; Karimi & Sam, 2005; Vaez-Zadeh & Esmaili, 2001; Hatefnia et al., 2010); none of them relied upon Farsi version of champion health belief model.

In addition, these studies are targeted in special group of women and none have evaluated health beliefs related to mammography screening with Farsi version of Champion Health Belief Model. Therefore, the aim of this study was to determine the effectiveness of breast cancer educational intervention based on HBM in Iranian women. The researchers hypothesized that women who received this breast cancer educational program would establish significant difference in knowledge and attitude about breast cancer comparison of women in control group.

Methods: Study design and sampling method

A Population-based controlled trial design was used to determine the effectiveness of breast cancer educational intervention. Participants were women 40 years and older which recruitment by telephone interview procedures that have been described in detail elsewhere (Moodi et al., 2012). In short, eligible women were identified from a population-based survey where was performed in Isfahan, a city located in central region of Iran between March 2011 and June 2011.

Three hundred and eighty four women aged 40 years and over who had not personal history of breast cancer, tendency to participant in the survey and being able to speak, were interviewed by telephone. From 384 eligible women, 290 women agreed to participate in educational program (response rate of 75.52%). Participants were randomly assigned to an intervention or control groups. A sample size of 121 women in each group would be required to confirm a minimum significant increase in mammography screening of 50%, a power of 90% with a 0.05 two-sided significant level. Based on a predicted attrition rate of 20%, our sample was to randomly assign 145 women in each group.

From 290 women who at first agreed to participate in education program, one of them in intervention group dropped out due to tripe. As a result, 144 women in intervention group and 145 women in the control group were participated in this study. All study activities were approved by the ethical committee of Isfahan University of Medical Sciences.

Measurement

Data collection instrument in this study include three sections: Socio-demographic questions, knowledge about breast cancer and questions about the HBM scale.

Information such as age, marriage age, age of first birth, level of education, current marital status, number of child, breastfeeding duration, menopausal status, health insurance coverage, monthly household income and ever heard or read about breast cancer provided the socio-demographic variables.

To measure the women's level of knowledge of breast cancer, we used 11 questions which were developed by the researchers based on an extensive review of the published studies. These questions were about breast cancer risk factors (6 items), sign and symptoms of breast cancer (1 item), early detection of breast cancer and, mammography screening (4 items). For all of questions, except of symptom of breast cancer, the answers were "true", "false" and "don't know". For each question, true response was scored as 1, false and don't know as 0. So, for each woman, a score between 0 and 11 was computed.

To assess beliefs and attitudes about breast cancer and mammography, we utilized the Champion Health Belief Model Scale (CHBMS). It is a commonly used scale to measure HBM components. The CHBMS was developed in 1984 and it has been revised three times. The latest version of the CHBMS was adapted for Iranian use by *Taymoori and Berry* (Taymoori & Berry, 2009). In this study, we used Farsi version of the CHBMS after allowance was obtained from authors. This scale includes 61 items with 8 subscales. However, only six subscales were used in this survey.

The HBM subscales which used in this study were the perceived susceptibility (3 items), perceived severity (7 items) to breast cancer, health motivation (7 items), benefits of mammography (6 items), barriers of mammography (10 items) and mammography self-efficacy (3 items). All the items had five response choices ranging strongly disagree = 1 to strongly agree = 5. Higher scores express more agreement with health beliefs except for barriers to mammography. Each subscale was calculated separately, and therefore, six different scores were obtained for each subject. Reported Cronbach alpha for Farsi version of CHBMS ranged from 0.72-0.84 (Taymoori & Berry, 2009).

In order to assess women's intention to get mammography, we utilized mammography stage of change scale developed by *Rakowski et al.* (Rakowski et al., 1996). Five stages of mammography adoption defined by Rakowski et al. including : (I) Pre contemplation (women who have never had no prior mammogram and are not planning to get a mammogram in the coming year), (II) Contemplation (women who are planning to get a mammogram in the coming year, but have not yet done), (III) Action (women who have had a mammogram with age-specific interval and intent to have another one in the coming year), (IV) Maintenance (women who have two or more mammogram on schedule and intend to have another one in the coming year) and (V) Relapse (women who have had one or more mammogram in the previous but don't intend to have another one in the coming year). This scale comprise of one question with five choices, subjects were placed in one of the five stage of change.

Educational intervention

Participants in the intervention group received the breast cancer educational program. Because of all of women could not simply participate in educational program, this educational program was conducted in 11 health centers in urban area of Isfahan, Iran. The educational intervention consisted of four teaching sessions and each session lasting 90-120 minutes which was organized for small groups of ten to fifteen women.

The content of educational programs included basic information regarding breast cancer facts and figures, breast cancer epidemiology, breast anatomy, risk factors of breast cancer development, signs and symptoms, important early detection, recommended screening methods, guidelines for

mammography screening, role of mammography in early diagnosis breast cancer and presentation list of governmental hospital where can get mammography. In addition to this information, each group received specific messages related to health motivation, susceptibility to breast cancer, the perceived benefits and barriers of mammography and perceived self-efficacy based on HBM.

Problem-solving approach was used in educational sessions. This approach allowed women to learn, encourage, and empower to have mammogram and take care of their health. During educational sessions, teaching methods such as PowerPoint presentation, educational film, group discussion, brain storming, question and answer and two pamphlets entitled "Know more about breast cancer" and "Mammography, useful test for early detection of breast cancer" were used. At the end of each session, the educator reviewed the important topics of this session and the women were encouraged to ask their questions about mentioned issues and their misperception were corrected.

Three months after the educational intervention, post-test was implemented by telephone interview in both of the intervention and control group. In intervention group, verbal and written consent and in control group only verbal consent obtained.

Data analysis

The obtained data were analyzed by SPSS version 16.0 (SPSS Inc, Chicago, Illinois). Descriptive analyses were utilized to summarize the subject's variables. Chi-square, t-test and paired t-test were used in the data analysis. In all of the tests, the level of significant was considered as $\alpha=0.05$.

Results

The mean and standard deviation of women's age was 50.48 ± 6.81 years in intervention group and 52.63 ± 8.97 years in control group. Table 1, presents the demographic and baseline characteristics of the intervention and control groups. The results showed that there was no statistically significant difference between the two groups in education, marital status, employed status, income, and child number and ever heard or read about breast cancer. The majority of the subjects were illiterate (33.1% in the intervention group and 25.5% in the control group), more than two-thirds of them were married and housekeeper in the two groups. The most of participants reported family monthly income as 300-700\$ (73.1% in intervention group and 66.2% in control group). In addition, 60.7% women in intervention group and 65.5% in control group stated that they had read or heard about breast cancer. In the experimental group, stage of change after intervention had a significant positive progress ($p<0.001$) (Table2).

The results of comparing the mean scores of HBM subscales before and after educational intervention within and between intervention and control groups are described in table3. Independent T-test showed that before intervention, the mean scores of knowledge and health beliefs in the two groups were similar in almost all subscales except to perceived severity and health motivation. Four weeks after educational intervention, the mean scores of knowledge, perceived susceptibility, perceived severity, health motivation, and perceived benefits of mammography and perceived self-efficacy of mammography were significantly higher in the intervention

group. Also, the mean scores of perceived barriers of mammography decreased in the intervention group.

Table 1. *Characteristics of Samples by study group*

Variables	Control (n=145)		Intervention (n=145)		statistics	
	n	%	n	%		
Education	Illiterate	48	33.1	37	25.5	$X^2=8.16, df=4$, $p=0.08$
	Elementary	35	24.1	37	25.5	
	Under diploma	16	11	33	22.8	
	Diploma	32	22.1	27	18.6	
	University	14	9.7	11	7.6	
Marital status	Married	123	84.8	127	87.6	$X^2=0.97, df=2$, $p=0.6$
	Widowed	20	13.8	15	10.3	
	Divorced/separated	2	1.4	3	2.1	
Family income	< 300\$	39	26.9	33	22.8	$X^2=3.28, df=3$, $p=0.3$
	300-699\$	96	66.2	106	73.1	
	700-999\$	8	5.5	6	4.1	
	> 1000\$	2	1.4	0	0	
Employment status	Housekeeper	120	82.8	113	77.9	$X^2=1.07, df=1$, $p=0.3$
	Employed	25	17.2	32	22.1	
Children Number	0	2	1.4	5	3.4	$X^2=7.7, df=4$, $p=0.1$
	1	7	4.8	5	3.4	
	2	24	16.6	38	26.2	
	3	36	24.8	40	27.6	
	>4	76	52.4	57	39.3	
Ever heard/read about breast cancer	Yes	88	60.7	95	65.5	$X^2=0.72, df=1$, $p=0.4$
	No	57	39.3	50	34.5	

Table 2. *Comparing stage of mammography adoption by time and group*

Stage of change	Group	PC n (%)	C n (%)	A n (%)	M n (%)	R n (%)	Chi-Square test
Baseline	<i>Intervention</i>	57 (39.3)	29 (20)	-	-	59(40.7)	P= 0.066
	<i>Control</i>	52 (35.9)	46 (31.7)	-	-	47 (32.4)	
Follow-up	<i>Intervention</i>		49 (35)	49 (35)	41 (29.3)	1 (0.7)	P<0.001
	<i>Control</i>	45(34.4)	42 (32.1)	4 (3.1)	3 (2.3)	37 (28.2)	

PC: Pre-contemplation; C: Contemplation; A: Action; M: Maintenance; R: Relapse.

Table 3. Comparison of Mean Scores of knowledge and CHBMS subscales by time and group

Variables	Group	Baseline (n=145)		Follow-up (n=145)		Paired T- test
		\bar{X}	SD	\bar{X}	SD	
Perceived susceptibility	<i>Intervention</i>	9.6	2.58	11.6	1.93	p<0.001
	<i>Control</i>	4	2.52	7	2.49	
		9.4		9.55		
T- independent		P=0.5		p<0.001		p=0.08
Perceived Severity	<i>Intervention</i>	23.	4.61	27.0	4.18	p<0.001
	<i>Control</i>	08	4.42	3	4.32	
		24.		24.6		
T- independent		P=0.008		p<0.001		
Health motivation	<i>Intervention</i>	23.	4.72	26.6	4.43	p<0.001
	<i>Control</i>	97	5.13	9	5.15	
		21.		21.7		
T- independent		p<0.001		p<0.001		
Perceived benefits	<i>Intervention</i>	20.	2.78	25.2	2.96	p<0.001
	<i>Control</i>	34	2.96	8		
		20.		20.5	2.96	
T- independent		P=0.5		p<0.001		p=0.5
Perceived barriers	<i>Intervention</i>	25.	6.29	18.7	5.43	p<0.001
	<i>Control</i>	68	6.21	9	6.17	
		25.		25.2		
T- independent		P=0.6		p<0.001		
Perceived self - efficacy	<i>Intervention</i>	11.	3.64	15.7	2.78	p<0.001
	<i>Control</i>	35	3.88	7	3.77	
		10.		10.4		
T- independent		P=0.05		p<0.001		

Discussion

This study was designed to evaluate the effectiveness of breast cancer educational intervention based on HBM on mammography screening stage of change in Iranian women. The study results indicated a significant positive progress in mammography screening stage of change in intervention group after educational intervention. This difference in stage of change between two groups can likely be attributed to the effectiveness of education based on HBM on stage of change in intervention group. The finding of this study is inconsistent with other studies (Fouad et al., 2010; Champion & Huster, 1995; Carney et al., 2005).

In this study, women's beliefs regarding to breast cancer and mammography screening behavior increased three months after educational

intervention in all of HBM components. According to HBM, women's perception of their susceptibility to breast cancer and the severity of the disease associated with their knowledge about disease (Farmer et al., 2007). The susceptibility referred to subject's individuals beliefs on vulnerability of the breast cancer. Women who received the educational intervention, their perceived susceptibility of having breast cancer increased in comparison with the control group. This finding is accordance with the earlier studies (Moodi et al., 2011; Hatefnia et al., 2010; Avci & Gozum, 2009; Wu et al., 2009; Hall et al., 2007; Bailey et al., 2000). In contrast with our study, Ceber's study reported the absence of significant difference in perceived susceptibility between experimental and control group (Ceber et al., 2010).

Perceived severity about breast cancer reflects "*the women's acceptance level in their life after having breast cancer*" (Gozum et al., 2010). Similar to our study, results of several studies showed positive change in mean scores of perceived seriousness after education (Moodi et al., 2011; Gozum et al., 2010; Hatefnia et al., 2010). It can conclude that educational intervention has a positive effect on subject's perceived threat about breast cancer. In the present study, the scores of health motivation and benefits of mammography were significantly improved in intervention group after receiving the educational intervention. Previous studies have found similar results (Gozum et al., 2010; Hatefnia et al., 2010; Avci & Gozum, 2009; Ceber et al., 2010; Secginli, & Nahcivan, 2011).

According to HBM, women who perceive more benefits and lower barriers from mammography, more likely perform mammography screening behavior (Garza et al., 2005). Results indicated that the educational intervention in this study increased perceived benefits and decreased perceived barriers significantly in intervention group comparison to control group. In a study from Turkey, peer education increased perceived benefits of mammography and lowered the perceived barriers of mammography (Gozum et al., 2010). Contrary to HBM and our study, in Hall et al study, mammography benefits and mammography barriers were not significantly different between the control and experimental groups (Hall et al., 2007).

Self-efficacy was found significantly higher in intervention group. After educational intervention, subjects had more confident to having mammography screening in intervention group. In other words, women perceived ability successfully perform mammography screening behavior. This finding is accordance with HBM and finding of previous studies (Hall et al., 2007; Ceber et al., 2010; Tuong-Vi Vo Ho, 2006; Hacıhasanoglu & Gozum, 2008).

Conclusion

The results of this study have confirmed the efficiency of educational intervention based on HBM in improving mammography screening stage of change. Hence, implementing appropriate educational programs with focus on benefits of Mammography in early detection of BC and creating positive motivation for health among women, can increase their adherence and transition into action and maintenance stages.

References

- ALTERS, S., & WENDY, S. (2009). *Essential concepts for healthy living* (pp. 363-366). 5th ed. Canada: Jones and Burtlett publishers.
- American Cancer Society (ACS) (2012). *Cancer Facts & Figures 2012*. Atlanta: American Cancer Society.
- AVCI, I. A., & GOZUM, S. (2009). Comparison of two different educational methods on teachers' knowledge, beliefs and behaviors regarding breast cancer screening. *European Journal of Oncology Nursing*, 13 (2), 94-101.
- BABU, G. R., SAMARI, G., COHEN, S. P., MAHAPATRA, T., WAHBE, R. M., MERMASH, S., et al. (2011). Breast cancer screening among females in iran and recommendations for improved practice: a review. *Asian Pacific Journal of Cancer Prevention*, 12 (7), 1647.
- BAILEY, E. J., ERWIN, D. O., & BELIN, P. (2000). Using cultural beliefs and patterns to improve mammography utilization among African-American women: the Witness Project. *Journal of the National Medical Association*, 92 (3), 136-142.
- CANBULAT, N., UZUN, Ö. (2008). Health beliefs and breast cancer screening behaviors among female health workers in Turkey1. *European Journal of Oncology Nursing*, 12 (2), 148-156.
- CARNEY, P., HARWOOD, B., GREENE, M., GOODRICH, M. (2005). Impact of a telephone counseling intervention on transitions in stage of change and adherence to interval mammography screening (United States). *Cancer Causes and Control*, 16 (7), 799-807.
- CEBER, E., TURK, M., CICEKLIOGLU, M. (2010). The effects of an educational program on knowledge of breast cancer, early detection practices and health beliefs of nurses and midwives. *Journal of Clinical Nursing*, 19 (15-16), 2363-2371.
- CHAMPION, V., & HUSTER, G. (1995). Effect of interventions on stage of mammography adoption. *Journal of Behavioral Medicine*, 18 (2), 169-187.
- CHAMPION, V., SPRINGSTON, J., ZOLLINGER, T., SAYWELL Jr, R., MONAHAN, P., ZHAO, Q., et al. (2006). Comparison of three interventions to increase mammography screening in low income African American women. *Cancer Detection and Prevention*, 30 (6), 535.
- FARMER, D., REDDICK, B., D'AGOSTINO, R., & JACKSON, S. A. (2007). Psychosocial correlates of mammography screening in older African American women. *Oncol Nurs Forum*, 34 (1), 117-123.
- FOUAD, M. N., PARTRIDGE, E., DIGNAN, M., HOLT, C., JOHNSON, R., NAGY, C., et al. (2010). Targeted intervention strategies to increase and maintain mammography utilization among African American women. *American Journal of Public Health*, 100 (12), 2526-2531.
- GARZA, M. A., LUAN, J., BLINKA, M., FARABEE-LEWIS, R. I., NEUHAUS, C. E., ZABORA, J. R., & FORD, J. G. (2005). A culturally targeted intervention to promote breast cancer screening among low-income women in East Baltimore, Maryland. *Cancer Control*, Suppl 2, 34-41.
- GHANBARI, A., & ATRKAR-ROSHAN, Z. (2004). A comparison between education by compact disc and booklet on learning outcome in nursing and midwifery students about breast self-examination. *Journal of Medical Faculty Guilan University of Medical Sciences*, 12 (48), 33-39.
- GLANZ, K., RIMER, B. K., & VISWANATH, K. (2008). *Health behavior and health education: theory, research, and practice*. San Francisco, CA: Jossey-Bass.
- GOZUM, S., KARAYURT, O., KAV, S., & PLATIN, N. (2010). Effectiveness of peer education for breast cancer screening and health beliefs in eastern Turkey. *Cancer Nursing*, 33 (3), 213-220.
- GURSOY, A. A., YILMAZ, F., NURAL, N., KAHRIMAN, I., YIGITBAS, C., ERDOL, H., et al. (2009). A different approach to breast self-examination education: daughters educating mothers creates positive results in Turkey. *Cancer Nurs*, 32 (2), 127-134.
- HACIHASANOGLU, R., & GOZUM, S. (2008). The effect of training on the knowledge levels and beliefs regarding breast self-examination on women attending a public education centre. *European Journal of Oncology Nursing*, 12 (1), 58-64.
- HADIZADEH-TALASAZ, F., & LATIF-NEZHAD, R. (2004). The effect of a training curriculum on attitude of female students about breast self-examination by using

- health belief model (HBM). *Journal of Birjand University of Medical Sciences*, 12 (1-2), 25-30.
- HALL, C. P., HALL, J. D., PFRIEMER, J. T., WIMBERLEY, P. D., & JONES, C. H. (2007). Effects of a culturally sensitive education program on the breast cancer knowledge and beliefs of Hispanic women. *Oncologie Nursing Forum*, 34 (6), 1195-1202.
- HATEFNIA, E., NIKNAMI, Sh., MAHMOUDI, M., GHOFRANIPOUR, F., & LAMYIAN, M. (2010). The Effects of health belief model education on knowledge attitude and behavior of Tehran pharmaceutical industry employees regarding breast cancer and mammography. *Behbood, The Scientific Quarterly*, 14 (1), 42-53.
- KARIMI, H., & SAM, Sh. (2005). Effect of breast self-examination (BSE) education on increasing women's knowledge and practice. *Ramsar Journal of Babol University of Medical Sciences*, 7 (3), 61-68.
- KIM, J., MENON, U., WANG, E., & SZALACHA, L. (2010). Assess the Effects of Culturally Relevant Intervention on Breast Cancer Knowledge, Beliefs, and Mammography Use Among Korean American Women. *Journal of Immigrant and Minority Health*, 12 (4), 586-597.
- KOLAHDOOZAN, S., SADJADI, A., RADMARD, A. R., & KHADEMI, H. (2010). Five common cancers in Iran. *Arch Iran Med*, 13 (2), 143-146.
- LIN, Z. C., EFFKEN, J. A. (2010). Effects of a tailored web-based educational intervention on women's perceptions of and intentions to obtain mammography. *Journal of Clinical Nursing*, 19 (9-10), 1261-1269.
- MOODI, M., REZAEIAN, M., MOSTAFAVI, F., & SHARIFIRAD, G. R. (2012). Determinants of mammography screening behavior in Iranian women: A population-based study. *Journal of Research in Medical Sciences*, 17 (8), 750-759.
- MOODI, M., BALALI-MOOD, M., SHARIFIRAD, G. R., SHAHNAZI, H., & SHARIFZADEH, G. R. (2011). Evaluation of breast self-examination program using Health Belief Model in female students. *Journal of Research in Medical Sciences*, 16 (3), 316-322.
- MOUSAVI, S. M., HARIRCHI, I., EBRAHIMI, M., MOHAGHEGHI, M. A., MONTAZERI, A., JARRAHI, A. M., et al. (2008). Screening for breast cancer in Iran: a challenge for health policy makers. *Breast Journal*, 14, 605-606.
- RAKOWSKI, W., EHRICH, B., DUBÉ, C., PEARLMAN, D., GOLDSTEIN, M., PETERSON, K., et al. (1996). Screening mammography and constructs from the transtheoretical model: associations using two definitions of the stages-of-adoption. *Annals of Behavioral Medicine*, 18 (2), 91-100.
- RUSSELL, K. M., CHAMPION, V. L., MONAHAN, P. O., MILLON-UNDERWOOD, S., ZHAO, Q., SPACEY, N., et al. (2010). Randomized trial of a lay health advisor and computer intervention to increase mammography screening in African American women. *Cancer Epidemiol Biomarkers Prevention*, 19 (1), 201-210.
- SECGINLI, S., NAHCIVAN, N. O. (2011) The effectiveness of a nurse-delivered breast health promotion program on breast cancer screening behaviours in non-adherent Turkish women: A randomized controlled trial. *International Journal of Nursing Studies*, 48 (1), 24-36.
- SEEDHOM, A. E., & KAMAL, N. N. (2011). Factors affecting survival of women diagnosed with breast cancer in El-Minia governorate, Egypt. *International Journal of Preventive Medicine*, 2 (3), 131.
- SIM, H. L., SEAH, M., & TAN, S. M. (2009). Breast cancer knowledge and screening practices: a survey of 1,000 Asian women. *Singapore Med Journal*, 50 (2), 132-138.
- TAYMOORI, P., & BERRY, T. (2009). The validity and reliability of Champion's Health Belief Model Scale for breast cancer screening behaviors among Iranian women. *Cancer Nursing*, 32 (6), 465-472.
- TUONG-VI VO HO, R. N. (2006). *Effects of an educational intervention on breast cancer screening and early detection in Vietnamese American women*. Texas Woman's University.
- VAEZ-ZADEH, N., & ESMAILI, Z. (2001). A comparative study on the effect of video and individual instruction on self examination of breast on performance of referring women to health service centers of Gaemshahr township, in 2000. *Journal of Mazandaran University of Medical Sciences*, 11 (30), 22-26.
- WU, T. Y., HSIEH, H. F., & WEST, B. T. (2009). Stages of mammography adoption in Asian American women. *Health Educational Research*, 24 (5), 748-759.