Investigation of Breast Self-Examination Behavior Based on Transtheoretical Model in Middle-Aged Women Covered by Alborz Health Centers in 2018

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Abstract---

Introduction: Breast cancer is the most common cancer among women in the world and in Iran. The incidence of breast cancer in Iran is at least one decade lower than that in developed countries. Screening for prevention is the most important effort to improve health in diseases. Breast self-examination and breast examination by specialist physicians and mammography (40 years and older) are early diagnosis methods, among which self-examination is cost-effective. In this study, Prochaska et al (1983) transtheoretical behavioral change model was used. The present study was conducted in 2018 with the aim of investigating the self-examination behavior based on the transtheoretical model in middle-aged women covered by Alborz health centers.

Methodology: In this descriptive-analytical study conducted in 2018, 496 middle-aged women (30-59 years old) referred to Alborz health centers were selected by stratified sampling method. To determine the stages of change in breast self-examination behavior, a checklist of Prochaska model of breast self-examination behavior was used. This checklist includes stages to change the behavior in performing breast self-examination screening and the five stages of pre-contemplation, contemplation, preparation, action, and maintenance. To collect the data, the research subjects were included into study after providing explanations for them about the objectives of the study and the confidentiality of the study and lack of need to write their name and address and the data were analyzed through SPSS16 software.

Results: In this study, 496 middle-aged women aged 30 to 59 years in Alborz province were studied. The age range of the subjects was 30 to 59 years with a mean age of 47.13 years and a standard deviation of 8.52. The distribution of subjects in each of the stages of breast self-examination behavior change was: 18.8% in pre-contemplation stage, 23.8% in contemplation stage, 29.4% in preparation stage, 15.1% in action stage, and 12.9% in maintenance stage. The relationship between age and breast self-examination behavior was evaluated based on a transtheoretical model (in three stages of pre-contemplation (1), contemplation + preparation (2), action + maintenance (3) through one-way analysis of variance (p-value=0.001). The results showed that this relationship was significant. Also, in this study, the relationship between education and breast self-examination behavior was investigated based on the transtheoretical model (in an integrated way: pre-contemplation, contemplation + preparation, action + maintenance) through Chi- Square test. The relationship

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between marital status and breast self-examination behavior was investigated based on a transtheoretical model (contemplation and preparation were combined and action and maintenance were combined) and their relationship was found to be significant (p-value=0.016). The relationship between the history of familial breast cancer and breast self-examination behavior was investigated based on the transtheoretical (3-stage) model with Chi-Square test. The test results showed a link between a familial history of breast cancer and breast self-examination (p-value-0.005) and it was found that people with a familial history of breast cancer showed a higher level of self-examination in the pre-contemplation and preparation stages.

Conclusion: *The research results showed that most of the people were in the pre-action stage and a small percentage of the participants were in the action and maintenance stage. Therefore, it is necessary to conduct educational interventions to inform women to promote breast self-examination behavior.*

Keywords--- *Breast Cancer, Breast Self-examination, Transtheoretical Behavior Change Stages.*

I. INTRODUCTION

Breast cancer is the most common cancer among women in the world, and more than 1.5 million people are affected by this disease annually (1). In 2015, 570000 people died due to breast cancer, accounting for 15% of all cancer-caused deaths (1). In Iran, breast cancer is the most common cancer among women and is a major concern among Iranian women (2). Mousavi et al showed that the incidence of breast cancer in Iran is 22 people per 100000 people and its prevalence is 120 per 100000 people (3). The incidence of breast cancer in Iran is at least one decade lower than that of developed countries (2). International studies have also shown that breast cancer increases with increasing age (7). According to the study conducted by Haririchi et al, the incidence of breast cancer among Iranian women is 48.8 years, and the highest risk of malignancy is observed in the age group of 40-49 years (2). Breast cancer may have an incubation period, so early detection and diagnosis can save a person from death (26). Evidence also shows that early and timely diagnosis of the disease has a great impact on successful treatment and reducing the spread of disease (6). Screening for prevention is the most important effort to improve health in diseases (4). Many women avoid screening (mammography, self-examination) while national guidelines have recommended it (5). It should be noted that the main factors that are important in the development of breast cancer include genetic mutations and family history breast cancer. Secondary factors that increase the risk of breast cancer include early onset of menstruation and late termination of it, postmenopausal hormone therapy, certain races, consumption of alcoholic drinks once or twice a day or more per day (8). Breast self-examination by the individual, examination by specialist physicians, mammography (40 years and older) are early detection methods of breast cancer. In this regard, self-examination is cost-effective (9 and 10). In this study, using the Prochaska method (1983), transtheoretical behavior change model was used. To determine the stage in this model, five stages were considered that included pre-contemplation (the patient does not intend to do that behavior and has not done it before), contemplation (the patient intends to do the behavior during the next 6 months and he has not done that behavior so far), preparation (the patient intends to do the behavior over the next 30 days and has not yet done that behavior), action (the patient does the behavior in less than 6 months), maintenance (it is for more than 6 months that the patient is doing the behavior (11 and 12).

In fact, moving towards the maintenance stage means its progress towards action. In a study, Prochaska behavior change model was used in moderating 12 behavioral problem. They include quitting smoking, quitting cocaine, weight control, a high-fat diet, juvenile delinquency, high-risk sexual behavior, using condom, using sunscreens, exposure to radon rays, exercising, mammography screening, and exercises preventing smoking by physicians (11). Based on the available documents, little research has been conducted on breast self-examination. In the present study, breast self-examination behavior is investigated using a checklist based on the transtheoretical model in middle-aged women.

II. METHODOLOGY

The study population is middle-aged women aged 30 to 59 years and living in Alborz. A total of 496 middle-aged women aged 30 to 59 years referred to Alborz Health Centers were examined. Using stratified sampling method, the city was first divided into four geographical areas of north, south, east, and west (four classes), and two health centers were randomly selected from the list of health center clinics.

Then, were collected samples from the centers appropriate to the number of people covered by that class. Completion of this 5-option questions was performed by health personnel. Inclusion criteria included women aged 30 to 59 years, willingness to participate in the study, and feasibility. Exclusion criteria also included having some degree of breast cancer, pregnancy and lactation, mastectomy during one or both sides. Data were collected by a 5-item question using similar studies (7, 13). The questionnaire has two section, the first section of which included the demographic characteristics of the studied people, including the variables of age, job, number of children, education, marital status, smoking (cigarettes and hookah) and taking drugs, family history of breast cancer, and using female hormones and the second section included one question about doing breast self-examination. It included s 5 options and each option indicates at what stage of the transtheoretical model the person is placed. It included: Do you perform breast self-examination every month?1-No and I do not intend to do it in the next six months (Pre-contemplation) 2- No but I intend to do it in the next six months (contemplation) 3- No, but I intend to do it in the next 30 days (Preparation) 4 - Yes, I have done it for less than six months (Action) 5 - Yes, I have done it for more than six months (maintenance). Accordingly, a score of 1 to 5 is assigned to this question, in which higher score indicates better self-examination. The scale for determining the stage of breast self-examination in the data analysis section is in two forms of pre-action (pre-contemplation, contemplation, and preparation stages) which indicate not doing the behavior and the stages of action and maintenance, which indicate doing the behavior (25). To collect the data, the subjects were included into study after providing explanations to subjects about the objectives of the study and the confidentiality of the study and the lack of need to write a name and address. They were analyzed using SPSS16 software.

III. RESULTS

In this study, 496 middle-aged women aged 30 to 59 years in Alborz province were examined. The age range of the studied subjects was 30 to 59 years with a mean age of 47.13 and a standard deviation of 8.52. The distribution of subjects in each stage of breast self-examination behavior change included: 18.8% in pre-contemplation, 23.8% in contemplation, 29.4% in preparation, 15.1% in action, and 12.9% in maintenance. The majority of the subjects had diploma (n=242 or 48.8%), housewives (n=394 or 79.4%), non-smoker and non-

users of alcohol and tobacco (n=486 or 98.0%), married (n=432 or 87.1%), had 2 children (n=154 or 31.0%), had no family history of breast cancer (n=471 or 95.0%), and did not use female hormone (n=437, 88.1%).

Table 1: Distribution of individuals in self-examination behavior based on the transtheoretical model

Self-examination behavior based on the transtheoretical model	Frequency	Percentage of frequency
Pre-contemplation	93	18/8
contemplation	118	23/8
Preparation	146	29/4
Action	75	15/1
Maintenance	64	12/9

In the present study, we examined the frequency of qualitative demographic variables using statistical analysis of Chi-square and examined the mean and standard deviation of quantitative variables with the ANOVA test and compared the results with the non-parametric tests mentioned below. It should be noted that in the table below, the pre-contemplation (1) and contemplation and preparation stages were integrated and the stages of action and maintenance were integrated and considered in the form of stage 3. The results of these two tests were examined.

Table 2: Frequency of demographic qualitative variables based on transtheoretical model in chi-square tests and mean and standard deviation in ANOVA test

Variable	Sub-group	Options of the question of self-examination behavior based on the transtheoretical model			Sum	p-value*
		Pre-contemplation (1)	Contemplation + preparation (2)	action+maintenance (3)		
		mean ± SD	mean ± SD	mean ± SD	mean ± SD	
Age		50.21 ±8.28	46.96 ±8.10	45.39±8.94	47.13± 8.52	0.0001
Number of children		2.55 ± 1.57	2.19 ±1.11	2.19 ± 1.54	2.26 ± 1.34	0.066
		Frequency (percentage of frequency)	Frequency (percentage of frequency)	Frequency (percentage of frequency)	Frequency (percentage of frequency)	
	Illiterate	(24)24	(45)45	(31)31	(100)100	

Education	Diploma	)50)20/7(	)134)55/4(	)58)24(	)242)100(	0.001
	Associate	)3)4/6(	)46)70/8(	)16)24/6(	)65)100(	
	Bachelor	(13.9)11	(49.4)39	(36.7)29	(100)79	
	master	(50)5	(0)0	(50)5	(100)10	
	Sum	(18.8)93	(53.2)264	(28)139	(100)496	
Job	Employed	(20.8)21	(44.6)45	(34.7)35	(100)101	0.131
	housewives	(18.2)72	(55.4)219	(26.3)104	(100)395	
	Sum	(18.8)93	(100)264	(28)139	(100)496	
Marital status	Single	(31.2)20	(40.6)26	(28.1)18	(100)64	0.016
	Married	(9.16)73	(1.55)238	(28)121	(100)432	
	Sum	(18.8)93	(53.2)264	(28)139	(100)496	
Smoking and taking drug	Yes	(20.0)2	(70.0)7	(10.0)1	(100)10	0.349
	no	(18.7)91	(52.9)257	(28.4)138	(100)486	
	sum	(18.0)93	(53.0)264	(28)139	(100)496	
Using female hormone	Yes	(1.7)1	(16.9)10	(81.4)48	(100)59	0.001
	No	(21.1)92	(58.1)254	(20.8)91	(100)437	
	sum	(18.8)93	(53.2)264	(18)139	(100)496	
history of breast cancer	Yes	(12)3	(84)21	(4)1	(100)25	0.005
	No	(19.1)90	(51.6)243	(29.3)138	(100)471	
	sum	(18.8)93	(53.2)264	(28)139	(100)496	

•P-value is based on one-way analysis of variance for variables of age and number of children and Chi-square test for other variables.

In the table above, the relationship between age and breast self-examination behavior was evaluated based on a transtheoretical model (in three stages of pre-contemplation (1), contemplation + preparation (2), action + maintenance (3) with using one-way analysis of variance. The results showed that this relationship is significant (P-value = 0.0001). As seen, lower mean age is seen in stage (3) and people with higher mean age is seen in stage (1). Thus, younger people showed more self-examination behavior in action and maintenance stages, while older people were in the pre-contemplation stage and it consistent with Spearman nonparametric test.

Also, the relationship between number of children and breast self-examination behavior was examined based on transtheoretical model with ANOVA test and this relationship was not significant (p-value 0.06). Also, in the present study, the relationship between education and breast self-examination behavior was examined based on the transtheoretical model (in an integrated way: pre-contemplation, contemplation + preparation, action + maintenance) with using chi-square test. 45% (highest percentage) of illiterate people were in stage 2 of this model and 55.4% of people (highest percentage) with bachelor degree were in stage 2. Also, 70.8% (the

highest percentage) of people with associate degree were in stage 2 of the breast self-examination behavior model. %49.4 of people (highest percentage) with bachelor degree were in stage 2 and 50% of people with a master degree or higher were in stage 3. Considering p-value, this relationship is also significant. The relationship between job and breast self-examination behavior were integrated based on transtheoretical model (contemplation and preparation were integrated and action and maintenance were integrated). The relationship between them is not significant according to p-value. In housewives, 55.4% (the highest percentage) were in the stage 2, 44.6% (the highest percentage) of employed people were in the stage 2. However, in employed people, 34.7% of people were in the stage 3 and 26.3% of housewives were in the stage 3. It indicates that employed people are more in action and maintenance stage. Also, the relationship between marital status and breast self-examination behavior was examined based transtheoretical model (contemplation and preparation and maintenance were integrated) and their relationship was found to be significant (P = 0.016). 40.6% of single subjects were at a stage where they have not had a breast self-examination behavior, but they intended to do it in the future. Also, 55.1% of married people were at a stage where they have not had a breast self-examination behavior, but they intended to do it in the future. In both cases, the highest percentage was related to the stage where they have not done it so far. Also, the relationship between drug use (tobacco and hooka) and breast self-examination behavior based on the transtheoretical model was examined with Chi-Square test.

Considering p-value=0.349, this relationship is not significant. The relationship between using female hormone and breast self-examination behavior was examined with using chi-square test, their relationship was significant and people who used female hormones showed more self-examination behavior and were in more stages of action and maintenance. The relationship between the familial history breast cancer and breast self-examination behavior was examined based on the transtheoretical model with Chi-Square test. Considering P-value = 0.005, there is a relationship between a familial history of breast cancer and breast self-examination behavior, and people with a familial history of breast cancer showed a higher level of self-examination behavior in stage 2.

Table 3: Mean and standard deviation of the score obtained based on the transtheoretical model in relation to demographic characteristics (1)

Quantitative variable	SD ± mean score Breast self-examination behavior based on transtheoretical model		p-value
Age	2.79±1.27		0.0001***
Number of children	2.79±1.27		***0.095
Qualitative variable	Sub-group	mean ±SD Breast self-examination behavior based on transtheoretical model	p-value

Smoking and taking drug	yes	2.20 ± 0.91	*0.12
	no	2.80 ± 1.27	
Using female hormone	yes	4.11 ± 0.81	*0.0001
	no	2.61 ± 1.21	
history of breast cancer	yes	2.44 ± 0.86	*0.161
	no	2.81 ± 1.28	
Marital status	single	2.60 ± 1.50	*0.110
	married	2.82 ± 1.23	
education	Illiterate	2.70 ± 0.35	** 0.77
	diploma	2.69 ± 0.24	
	associate	3.09 ± 1.08	
	bachelor	3.01 ± 1.29	
	master	2.50 ± 1.58	
job	employed	2.76 ± 0.32	* 0.78
	housewives	2.80 ± 1.25	
Higher self-examination score indicates better self-examination behavior *Mann-Whitney ** Kruskal-Wallis test *** Spearman correlation test			

Minimum score 1, which indicates that the patient is at the pre-contemplation stage, and maximum score 5, which indicates that the patient is at the maintenance stage of breast self-examination behavior.

Using Spearman non-parametric correlation test, the relationship between age and breast self-examination behavior was assessed. The correlation between age and self-examination behavior was significant (p = 0.0001). There was an inverse relationship between age and breast self-examination behavior. It means that self-examination behavior decreased with increasing age (at old age, they were in the pre-contemplation and contemplation stages) (R = -0.202). Also, using Spearman correlation test, the relationship between the number of children and breast self-examination was assessed. The correlation between the number of children and breast self-examination behavior was not significant (p-value=0.095). In the table above, the relationship between substance use (including cigarettes, hookah and drug) and breast-self-examination behavior was tested with the Mann-Whitney test, the relationship between substance use and breast self-examination behavior was not significant (p-value = 0.12). The relationship between using female hormone and breast self-examination behavior was examined by the Mann-Whitney test and their relationship was significant, and people who used

female hormones showed more self-examination behavior and they were more in the action and maintenance stages. The relationship between familial history of breast cancer and breast self-examination behavior was also investigated.

The relationship between them was not significant (p-value = 0.161). The relationship between marital status and breast self-examination behavior was examined by Mann-Whitney test. Although in the married group, the self-examination behavior was higher but this difference was not significant (p-value = 0.110). The relationship between education and breast self-examination behavior was examined by Kruskal-Wallis test. Although people who had an associate and bachelor degree showed more self-examination behavior, but this difference was not significant (p-value = 0.777). Also, the relationship between job and self-examination behavior was examined with Mann-Whitney test and the relationship between them was not significant (p = 0.78).

IV. DISCUSSION AND CONCLUSION

People in the pre-contemplation stage are less aware of the risks of breast cancer and the breast self-examination behavior (22). Therefore, informing and motivating at this stage to perform the breast self-examination behavior can be effective in this regard. In the present study, 23.8% of people were in the contemplation stage. It means that the person intends to perform breast self-examination behavior during the next 6 months and assess the interests and benefits and barriers of performing breast self-examination behavior have not yet motivated enough to perform this behavior (21). Several studies have shown that people who are in the contemplation stage think about barriers beyond their interests and do not have the motivation to perform it (21), indicating that 42.54% of people have no intention to do it at the present time. Hence, informing and motivating them to more towards action stage is necessary (21). 29.4% of the people were in the preparation stage, where they are ready to change their behavior based on the stages of the change and make the change in the next 30 days. At this stage, appropriate educational intervention is helpful to motivate people to move towards action stage (22).

In general, 71.9% of people were in the pre-action stage. 15.1% of the people were in the action stage and these people performed the breast self-examination behavior only once and 12.9% of them were in the maintenance stage and this group performed the breast self-examination behavior more than once. In the study conducted by Pirasteh et al on the breast self-examination behavior change stages, 73.8% of the subjects were in the pre-action stage and 26.2% were in the action stage (14). In another study conducted by Vahedian et al on the breast self-examination behavior change stages, 63.6% of people were in the pre-action stage and 36.4% were in the action stage (23).

In the study conducted by Moodi et al on breast self-examination behavior in Birjand, 75.8% of the patients were in the pre-action stage and 18.2% were in the action stage (24). Therefore, according to similar studies in this field, awareness is considered as the most important predictor of breast self-examination behavior. Therefore, educational intervention appropriate to change stages is necessary to enhance the awareness and knowledge of people to screen for breast self-examination screening. Comparing this value with the values reported by previous studies in Iranian women shows that the rate of breast self-examination is low in Iranian women. Also, due to the high prevalence of breast cancer, appropriate educational planning on breast self-

examination is necessary to increase this behavior, and with timely diagnosis of mortality and morbidity, it is possible to prevent the disease by relying on behavior change model.

Acknowledgments

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