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## EFFECT OF EDUCATION BASED ON HEALTH BELIEF MODEL ON KNOWLEDGE AND ATTITUDE OF WOMEN TOWARDS NUTRITIONAL BEHAVIORS RELATED TO CARDIOVASCULAR DISEASES PREVENTION

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### Abstract:

**Introduction:** Cardiovascular diseases are one of the main causes of mortality and disability. This study was done to determine the effect of education based on HBM on knowledge and attitude of women towards nutritional behaviors related to cardiovascular diseases.

**Methods and Materials:** This quasi-experimental study with before and after educational intervention conducted in 2015, by using simple random sampling 63 female housewives participated. Valid and reliable questionnaire based on HBM completed by the participants before intervention. Then, the education was done about the nutritional factors related to cardiovascular diseases in the form of lecture, group discussion and questioning and answering in 4 sessions. Questionnaire was complete done month after. Data were analyzed by SPSS 16 and paired – T test, ANOVA and Pearson correlation coefficient.

**Result:** The mean score of the studied cases' knowledge was  $68.57 \pm 14.25$  and  $92.59 \pm 6.14$  before and after education, respectively. The mean score of perceived sensitivity and severity were  $55.65 \pm 10.02$  and  $58.63 \pm 12.67$  before education respectively and they were, in turn  $78.17 \pm 14.4$  and  $75 \pm 20.31$  after the education. The mean score of perceived benefits and self – efficacy were  $64.68 \pm 13.19$  and  $43.84 \pm 7.27$  before education and they were also, in turn,  $84.25 \pm 11.21$  and  $66.76 \pm 13.72$  after education. The increases in all five constructs were significant ( $P < 0/001$ ). The perceived barriers' mean score was  $59.46 \pm 18.83$  before education and reached down to  $39.79 \pm 18.75$  after education, respectively. These differences were significant as well ( $P < 0/001$ ).

**Conclusions:** The education based on Health Belief Model causes to increase the knowledge and improve the attitude about preventing nutritional behaviors towards cardiovascular diseases.

**Key words:** Education, Health Belief Model, Nutrition, Cardiovascular Diseases

**Introduction:** Nowadays, cardiovascular diseases are considered as one of the main causes of mortality and disability around the world. (1, 2) According to WHO's report, 29 percent of death cause is related to cardiovascular diseases globally. (3) 17/3 million people passed away due to Cardiovascular Diseases in the world in 2008. This will be estimated to reach to around 23/6 million ones in 2030. (4) In Iran, they are the first cause of mortality and the main agent of more than 30 percent of deaths. (5) Unfortunately, the prevalence of these diseases is increasing (6) and the age of its incidence is declining in recent years. (7) Since the mortality caused by cardiovascular diseases is higher in developing countries rather than developed ones, preventive measures are considered among the health priorities in these countries. (8) On the other hand, recognizing and controlling the risk factors is regarded as the major reason of reducing cardiovascular diseases in developed countries. (9) Nutrition plays an important role in maintaining the health and preventing from diseases. A healthy diet can reduce the risk of progressive diseases such as Cardiovascular Diseases, cancers and diabetes. (10) Unhealthy diet, smoking, inactivity and obesity affect the prevalence of Cardiovascular Diseases remarkably.

Unhealthy diet is noted as the most significant factor among other ones (11, 12, 13). Suitable food diet can be consisted mostly of consuming fruits and vegetables, low fat dairy products, the beans and complete grains, fish and low fat meals. They decrease the risk of chronic diseases such as cardiovascular diseases (14, 15). The habits associated with eating, cooking and the amount of consumed salt are also addressed as the influencing factors of Cardiovascular Diseases incidence (16).

Although a lot of programs have been established to increase the knowledge of people about the risk factors of cardiovascular diseases in Iran and other countries, WHO's reports shows that the number of the individuals suffering from these diseases is going up increasingly. The education can improve to make comprehensive programs for preventing from these sorts of diseases (17). Since the pattern of nutrition is changed in Iran gradually towards consuming high fat and High-calorie meals and also fast foods tremendously, it is very crucial to conduct educational interventions about nutrition – related behaviors (18).

As far as related to behavior, having enough knowledge about the risk factors associated with cardiovascular diseases is so important that it can help the people to make the effective decision for keeping the behaviors which cause to

increase the risk of cardiovascular diseases or quitting them. In addition the person's perception about the risk of disease affects his / her behavior – related performances as well (19). The individuals and communities need to receive the education associated with appropriate behaviors in order to recognize and take healthy lifestyles. According to this, the role of health education is very considerable (20). The impact of education programs depends on their efficacy. Furthermore, the more suitable theoretical background of these programs, the more efficacy of nutrition – oriented education programs in changing nutrition – related behaviors (21).

Health Belief model is a sort of models which is used to educate appropriate food diet. Educational interventions can be designed and performed in order to prevent from the diseases by using this model (2). It is, in fact, more effective in preventing from the diseases and illustrating the association between beliefs and behaviors. These beliefs contain the susceptibility of the person to the disease and its impact on his / her life (23). As a matter of fact, Health Belief Model is established on the basis of recognizing the person's beliefs, his / her perception about the severity and sensitivity towards the disease and current strategies and also their barriers and benefits of performing them in order to decrease the possibility of disease incidence (24).

The education of nutrition – related behaviors associated with cardiovascular diseases is very important among females, because they have received a huge number of concepts related to food diet which affect not only their own health situation but also their off springs' and family's health for a long time (18) Since few studies were found in scientific references and credible websites about this subject and no investigation has been done in Behbahan city yet, the present research is conducted. The aim of this study was to determine the impact of education based in Health Belief Model over the attitude and knowledge of the females in Behbahan city towards nutrition – related behaviors associated with cardiovascular diseases.

### **Methods and materials:**

This is a quasi –experimental and prospective study in which the housewives referring to Behbahan's health centers participated. According to other similar research which were intervening and the formula of determining sample size, the number of participants were calculated by 95 percent of confidence interval and /84 as the power of the test for selecting the samples, the list of all health centers in Behbahan city was provided and one of them was selected randomly. Then, the charts of the families were monitored and 63 women were chosen completely at random according to inclusion criteria. These criteria included the age of 18 to 50, being married and housewife, being literate and having the access to a telephone line for follow – up. Their participation was dependent on their personal

tendency and satisfaction. They were also made assured that their given information would be confidential. The instrument of data collection included a questionnaire used in the study of Tavasoli et al (7) which was designed on the basis of Health Belief Model about nutrition – related behaviors associated with cardiovascular diseases.

The first part of this questionnaire contains demographic data of studied cases (including age, educational level, the history of regarding especial food diet and family history of cardiovascular diseases). The second part of the 30 questions on knowledge and the third part of their attitudes with 26 questions on the basis of Health Belief Model's different dimensions (perceived susceptibility with 4 questions, perceived severity with 4 questions, perceived benefits 3 questions, perceived barriers with 7 and perceived self-efficacy with 8 questions) about the measure. In the mentioned questionnaire, every correct answer to knowledge question was received score one and every wrong or non – answered option was received score zero. For the questions of Health Belief Model's dimensions, the scoring is from zero to four according to five – option liker scale (from absolutely I agree to I disagree absolutely. Finally, the scores are converted into percentage in all dimensions so that the least and most score are considered zero up to 100.

The reliability and validity of the gathered data were investigated in the study of Tavasoli et al (7). In this research, Cronbach alpha for questions knowledge, perceived sensitivity, severity, benefits, barriers and self – efficacy were achieved, 0/65, 0/88, 0/8, 0/79, 0/72 and 0/41, respectively. This was done by internal consistency method(7).

After completing the questionnaire in the first episode, educational programs were designed according to the results of pre – test, the constructs of Health Belief Model with definite goal. Credible scientific content and appropriate educational materials were also considered in this design. Due to the shortage of educational places, the studied people were divided into 3 groups including 20 to 22 cases in every individual group. For each group, four educational sessions within 40 – 50 minutes were held during two weeks. The educational intervention was conducted through direct method including participatory models and activating with asking and giving response and also brainstorming method. At the first session, some materials about cardiovascular disease, attributing causes, the factors influencing the risk of incidence, and harmful and useful meals associated with this sort of disease were presented by showing slides. Applying Health Belief Model, it was strived to be perceived the range of dangers which threaten the studied cases' health (received senility) by cardiovascular diseases. Then, it was expected that they found out the severity and seriousness of the dangers (perceived severity). In the second session, the disadvantages of consuming fat, fried and conserved meals, fast foods, high amount of salt and also advantages of having fruits, vegetables, beans and low – fat dairies were presented by use of Health Belief Model. After that, the advantages and

disadvantages of regarding nutrition – related points associated with cardiovascular diseases were discussed by the studied cases themselves through group discussion. This was done to believe the advantages of taking health behaviors (perceived benefits). In the third session, brainstorming method was used in order to make the learners motivated so that they became capable to express the factors which they considered as the barriers against regarding nutritional recommendations.

Meanwhile, some alternatives were presented (perceived barriers). At the last session in which self – efficacy construct was focused on, the studied cases discussed their ability in recognizing the food materials making and preventing cardiovascular diseases and also informing the other people about the factors causing them and their ability in regarding nutritional considerations (perceived self –efficacy). This was done through group discussion method. One month after the last episode of educational session (in order to regarding the stability of the educated subjects), the questionnaire was completed again by the studied cases. The analysis of data was done by SPSS (version 16), T – paired test, ANOVA and Pearson correlation coefficient.  $P < 0/05$  was supposed as the level of significance).

### Result:

In present investigation, 63 housewives participated. Their mean age was  $31/9 \pm 7/75$ . 68/3 percent of them were less than 34 years old and 31/7 percent was 34 and more than this. No significant correlation was found between age and the constructs of Health Belief Model. ( $P > 0/05$ ).The frequency distribution of demographic data was shown in table one (table 1). It shows that most of the cases graduated from high school and university. ANOVA showed that not significant scores Mean difference constructs of Health Belief Modelin education different levels (Table 2). 78 percent of them disregarded any history of staying on adiet. 68/5 percent had no record of heart disease in their family. The comparison between the mean score of knowledge and Health Belief Model’s constructs was shown in table two before and after education. It indicates significant relation between them in two episodes. ( $P < 0/001$ ) (Table 3).

**Table1: The frequency distribution of demographic data.**

Variable		Percent	Number
Level of Education	Elementary	6.3	4
	Middle school	12.7	8
	High School	49.2	31

	Collegiate	31.7	20
<b>Dietary history</b>	Yes	22.2	14
	No	77.8	49
<b>Heart disease in family</b>	Yes	31.7	20
	No	68.3	43

Table2: The comparison scores Mean constructs of Health Belief Modelin education different levels.

Variable		Mean ± SD	P Value
<b>knowledge</b>	Elementary	67.5 ± 13.15	0.76
	Guidance	63.75 ± 10.6	
	High School	68.81 ± 15.11	
	Collegiate	70.33 ± 15.66	
<b>perceived sensitivity</b>	Elementary	62.5 ± 5.1	0.07
	Guidance	50 ± 12.5	
	High School	54.23 ± 9.86	
	Collegiate	58.75 ± 8.69	
<b>Perceived severity</b>	Elementary	70.31 ± 9.37	0.11
	Guidance	52.34 ± 8.79	
	High School	59.64 ± 13.77	
	Collegiate	57.18 ± 11.51	
<b>perceived benefits</b>	Elementary	64.58 ± 17.17	0.24
	Guidance	56.25 ± 15.26	
	High School	66.93 ± 10.86	
	Collegiate	64.58 ± 14.52	
<b>perceived barriers'</b>	Elementary	67.85 ± 15.15	0.48
	Guidance	58.92 ± 16.19	
	High School	60.94 ± 15.97	
	Collegiate	55.71 ± 15.77	
<b>self – efficacy</b>	Elementary	42.96 ± 5.33	0.18
	Guidance	44.53 ± 2.2	
	High School	42.03 ± 8.1	
	Collegiate	46.56 ± 7.01	

**Table 3: The comparison between the mean score of knowledge and Health Belief Model's before and after the education.**

Variable		Mean ± SD	P Value
knowledge	Before education	68.57 ± 14.25	P < 0/001
	After education	92.59 ± 6.14	
perceived sensitivity	Before education	55.65 ± 10.02	P < 0/001
	After education	78.17 ± 14.4	
Perceived severity	Before education	58.63 ± 12.67	P < 0/001
	After education	75 ± 20.31	
perceived benefits	Before education	64.68 ± 13.19	P < 0/001
	After education	84.25 ± 11.21	
perceived barriers'	Before education	59.46 ± 18.83	P < 0/001
	After education	39.79 ± 18.75	
self – efficacy	Before education	43.84 ± 7.27	P < 0/001
	After education	66.76 ± 13.72	

**Discussion:**

The findings of this study demonstrated that the level of the studied people's knowledge increased significantly after intervention. There was a study in which the level of knowledge of the cases improved from 44 to 88 percent before and after education, respectively, about cardiovascular diseases (25). The same results were found in two other investigations as well (26, 27). The study of perceived severity as a construct of Health Belief Model showed that the mean score of this construct increased significantly after intervention. This was the same as the findings of Tavasoli et al's (7) and Ghafari et al's (26) research.

Another study indicated that the mean score of perceived sensitivity about nutrition in diabetes improved after education (27). It means that the people found themselves prone to the hazards of disregarding healthy regimen when their perceived sensitivity developed.

Perceived severity increased significantly after education in present research so that the studied persons found out the dangers of disregarding nutritional points more than before. This is compatible with the studies' results of Tavasoli et al (7), Ghafari et al (26) and Sharifirad et al (27).

Ghohravardi et al came to this conclusion about the perception of cardiovascular diseases danger in their study. It is recognized, in the mentioned research, as an important predicting factor in persuading people to regard healthy diet – related behavior. So, the attempt to improve this sort of perception and leading people to take more effective

nutritional performances would be fruitful in cardiovascular diseases prevention process (1). After education, the mean score of perceived barriers increased significantly in this study. In other words, they achieved more understanding about the advantages of regarding nutritional recommendations including the improvement of body's systems such as cardiovascular and also gastrointestinal tracts, establishing more self – esteem towards health maintenance, prevention from other diseases and considering economic remarks. In general, they gained more positive attitude about taking regimen. A study showed that when the person perceives the benefits, it is more possible to make a strong relation between perceived benefits and taking preventive behaviors (22). Improvement of the mean score of perceived benefits by use of Health Belief Model has been affirmed in other studies (7, 23, 27, 26) which is compatible with present study's findings. The achieved results about perceived barriers, in present research, showed that the mean score of perceived barriers decreased significantly after education. The studied cases were lead to recognize useful and harmful meals associated to cardiovascular diseases in a way that the barrier called the lack of knowledge was removed. They, then, could teach their own family's members about the hazard of harmful food materials to persuade them to consume less salt gradually. This caused to remove the barriers including the lack of authority in selecting meals and their tastelessness. There was also a study reported that the lack of people's knowledge about suitable nutritional patterns made an important barrier against its conducting it(28). Another study indicated that lacking enough support of different food taste, existing remarkable cultural and economical factors and the lack of having access to healthy food materials in all seasons are some remarkable barriers against regarding the regimen preventing from Cardiovascular Diseases (29). Significant decrease in the mean score of perceived barriers after educational intervention was affirmed in some other investigations (7, 20, 26, 27). The studied people in the mentioned research, perceived less barriers in taking suitable behaviors.

In this investigation, the mean score of perceived self – efficacy which was less than average level, improved significantly after intervention so that the women's perception in recognizing the food materials causing and preventing cardiovascular diseases and also regarding nutrition recommendations increased. The same results were reported in the two similar studies (7, 20). In fact, perceived self – efficacy is a key variable in taking safe behaviors in a way that a significant correlation between self – efficacy and preventing behaviors was found (30 , 31). In present investigation, no significant relation was seen between demographic variables and the constructs of Health Belief Model. This is similar to the findings of Ghahroudi et al's study. However, there was a direct relation between the participants' age and their perception about disease danger in the mentioned investigation (1). The same results

*Marziye Reisi\* et al. International Journal of Pharmacy & Technology* were reported in Winham's and Lefler's research (19, 32). There was also no significant relation between the studied cases' education level and their knowledge and also the constructs of Health Belief Model. Similar to Ghahroudi et al.'s study (1), another research showed a direct relation between education and knowledge levels of the studied people (24). This difference may be due to the closeness of the studied case's education level in present study.

In other words, their education level was mostly in high school and academic level. Whereas, most of the cases in the mentioned investigation studied mostly up to high school level. Since the people in present research was literate housewives, the achieved findings can not be generalized to illiterate ones and this is, in fact, a shortcoming for this study.

### **Conclusion:**

This project showed that health education programs designed by Health Belief Model causes to improve the knowledge level and affect positively perceived sensitivity, severity, barriers, benefits and self – efficacy among housewives about nutritional points associated to cardiovascular diseases. Therefore, it is suggested to conduct the education for other factors related to cardiovascular diseases such as smoking, physical activity and stress in the next studies in future. Performing similar research and designing preventing programs may be caused to decrease the number of cardiovascular diseases.

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