

Investigating Preventive Nutrition Behaviors For Cardiovascular Diseases Based on the Health Belief Model in Women in Behbahan, Iran

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ABSTRACT

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Background: Today, cardiovascular diseases are one of the main causes of mortality around the world, including Iran. One of the important factors in preventing these diseases is healthy nutrition behaviors. Therefore, the current study used the health belief model to investigate preventive nutrition behaviors for cardiovascular diseases in women in the city of Behbahan, Iran.

Methods: This descriptive study was carried out from March 2015 to March 2016 on 63 housewives visiting health care centers in Behbahan. The data gathering tool was a valid and reliable questionnaire based on the health belief components filled by the participants in the study. Data were analyzed using ANOVA and the Pearson correlation test at the significance level of $p < 0.05$ on SPSS 16.

Results: The mean score was 68.57 ± 14.25 for awareness, 55.65 ± 10.02 for perceived susceptibility, 58.63 ± 12.67 for perceived severity, 63.68 ± 13.19 for perceived benefits, 59.46 ± 15.83 for perceived barriers, and 43.84 ± 7.27 for self-efficacy. The difference between participants with and without diet experiences was not significant for any of the health belief model dimensions. There was also no significant difference in the mean dimension scores between people with and without a family history of cardiovascular diseases ($p > 0.05$).

Conclusion: Considering the average awareness of women, it seems that the implementation of programs based on educational models can help reduce the number of cardiovascular diseases.

Introduction

Cardiovascular diseases are the most common causes of death worldwide and one of the most important reasons for disabilities [1-2]. Annually, there are around 51 million deaths worldwide, of which 12.8 million are related to cardiovascular disease. In Iran, there are more than 90 thousand annual deaths due to these diseases. Cardiovascular diseases, despite being among the most preventable conditions, impose a huge burden on health care systems of countries [3].

Nutrition plays an important role in maintaining health and preventing certain diseases. A healthy diet can help prevent several progressive diseases such as cardiovascular conditions, cancer, and diabetes [4]. An unhealthy diet, smoking, lack of physical activity, and obesity can greatly increase

the chances of cardiovascular diseases, and nutrition is one of the most important factors in this regard [5-7]. A proper nutritional pattern, including the use of fruits and vegetables, low-fat dairy products, whole grains and cereals, fish, and low-fat foods can reduce the risk of chronic diseases such as cardiovascular problems [8-9]. Other eating habits, cooking methods, and salt intake can also affect cardiovascular diseases [10].

As regards behavior, awareness of cardiovascular diseases and their risk factors are necessary to make informed decisions about the continuation of behaviors that increase the risk of these diseases [11]. In order to identify correct lifestyles and prevent diseases, people and societies require education about correct

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behaviors, one of the key points of which is health education [12].

The health belief model is one of the models used for education about diet and nutrition and can be used for designing and implementing preventive interventions for various diseases and conditions [13]. The model mostly emphasizes prevention and shows the relation between beliefs and behaviors. These include beliefs about people's vulnerability to diseases and the effect of these diseases on people's lives [14]. In fact, the health belief model emphasizes the identification of people's beliefs and perceptions regarding the severity of diseases, the available strategies to prevent those diseases, and possible barriers preventing the strategies from reducing the risk of the diseases [15]. Nutrition behaviors related to cardiovascular diseases are especially important in women because most diet concepts are first used by them, and therefore their nutrition behavior can affect their own health as well and their families and children in the future [16]. Since reviewing scientific sources showed limited studies in this field, and due to lack of similar studies in the city of Behbahan, the present study aimed to investigate preventive nutrition behaviors for cardiovascular diseases in women in the city of Behbahan based on the health belief model.

Subjects and methods

This was a descriptive-analytical study conducted from March 2015 to March 2016. The study population included all housewives visiting community health centers in Behbahan. First, a list of all health centers in Behbahan was created, and one of the centers was randomly selected. Then, 63 women were randomly selected based on the following inclusion criteria: being 18-50 years old, being literate, and being available through telephone for future follow-ups. The inclusion of people in the study depended on their consent and they were all assured about the confidentiality of the gathered information.

The data collection tool was a questionnaire developed by Tavasoli et al [17] based on the health belief model. The first part of the questionnaire includes demographic information (age, education, previous diets, and family history of cardiovascular diseases), and the second part includes 30 questions for measuring awareness and 26 questions for measuring the dimensions of the health belief model (perceived susceptibility [4 questions], perceived severity [4 questions],

perceived benefits [3 questions], perceived barriers [7 questions], and self-efficacy [8 questions]). For scoring the awareness questions, each correct answer received 1 score, while incorrect or "don't know" answers received a score of 0. The questions in the health belief section were scored on a 5-point Likert scale from 0 (completely agree) to 4 (completely disagree). Finally, the scores of all sections were converted to percentages. The reliability and validity of the questionnaire were determined. Cronbach's alpha was calculated to be 0.65 for awareness, 0.88 for perceived susceptibility, 0.80 for perceived severity, 0.79 for perceived benefits, 0.72 for perceived barriers, and 0.41 for self-efficacy questions [17].

One-way analysis of variance, unpaired t tests, and the Pearson correlation were used to analyze the data. Data analysis was carried out using SPSS 16 software at the significance level of 0.05.

Results

The mean age of the participants was 31.9 ± 7.75 , with the majority (68.3%) being younger than 34 years. The frequency distribution of demographic characteristics (Table 1) shows that the majority of participants had a high school or university education.

The mean score was 68.57 ± 14.25 for awareness, 55.65 ± 10.02 for perceived susceptibility, 58.63 ± 12.67 for perceived severity, 63.68 ± 13.19 for perceived benefits, 59.46 ± 15.83 for perceived barriers, and 43.84 ± 7.27 for self-efficacy. There were no significant relationships between demographic factors and the dimensions of the health belief model ($p > 0.05$). Analysis of variance showed that the difference in the scores for various dimensions of the model was not significant among participants with different educational levels (Table 2). More than 78% of the participants had no previous experiences with diets, and 68.5% reported no previous family history of cardiovascular diseases. Independent t test showed that there was no significant difference in the mean scores on various dimensions of the model between women with and without previous experience with diets. Nor was there any significant difference in the mean scores between participants with and without a family history of cardiovascular diseases ($p > 0.05$).

Table 1. Frequency distribution of demographic characteristics in the study population

		Frequency	Percent
Education	Elementary school	4	6.3
	Middle school	8	12.7
	High school	31	49.2
	University	20	31.7
Previous diet experience	Yes	14	22.2
	No	49	77.8
Family history of cardiovascular diseases	Yes	20	31.7
	No	43	68.3

Table 2. Comparing the mean score on different dimensions among various educational levels

Factor		Mean \pm standard deviation	P value
Awareness	Elementary school	67.50 \pm 13.15	0.76
	Middle school	63.75 \pm 10.60	
	High school	68.81 \pm 15.11	
	University	70.33 \pm 15.66	
Perceived susceptibility	Elementary school	62.50 \pm 5.10	0.07
	Middle school	50.00 \pm 12.50	
	High school	54.23 \pm 9.86	
	University	58.75 \pm 8.69	
Perceived severity	Elementary school	70.31 \pm 9.37	0.11
	Middle school	52.34 \pm 13.77	
	High school	59.64 \pm 13.77	
	University	57.18 \pm 11.51	
Perceived benefits	Elementary school	64.58 \pm 17.17	0.24
	Middle school	56.25 \pm 15.26	
	High school	66.93 \pm 10.86	
	University	64.58 \pm 14.52	
Perceived barriers	Elementary school	67.85 \pm 15.15	0.48
	Middle school	58.92 \pm 16.19	
	High school	60.94 \pm 15.97	
	University	55.71 \pm 15.77	
Perceived self-efficacy	Elementary school	42.96 \pm 5.33	0.18
	Middle school	44.53 \pm 2.20	
	High school	42.03 \pm 8.10	
	University	46.56 \pm 7.01	

Discussion

Cardiovascular diseases are the main cause of mortality worldwide, killing more than 17 million people annually. Without proper prevention, this number will reach 24.8 million by 2020 [18]. The current study showed that participants had strong awareness of the risk factors for cardiovascular diseases, which was also confirmed in the study by Shahbazi et al [19].

Women are one of the largest groups of any society, with a profound effect on society as a whole, and their awareness, attitudes, and behaviors in each context directly, or indirectly, affect the society. It can be said that diet and

nutrition concepts and habits acquired by women not only affect their own health but also has sustainable health effects on their future children and family members [20].

One of the first and most important steps in health education is making people aware of healthy lifestyle practices that can contribute to physical, mental, and social health. Therefore, awareness has a significant role to play in creating lasting changes in health behaviors. Finally, we can expect people to prevent cardiovascular diseases successfully through their behavior only if they are fully aware of the necessary behaviors, know the results of these behaviors, and also receive complete and accurate information.

The average scores obtained for the various dimensions of the health belief model in our study are similar to those reported by Tavasoli et al [17] and Ghafari et al [21]. Sharif-Rad et al [22] also reported that average scores for perceived susceptibility and severity were desirable. Perceived susceptibility and severity reflect people's attitudes toward a problem. In general, attitude is related to people's emotions. In regard to cardiovascular diseases, Ghahroudi et al state that since the perceived risk of cardiovascular diseases based on people's tendency toward unhealthy nutrition behaviors is known, investigating people's perception of this risk and increasing their awareness of the risks can help guide people toward more healthy nutrition behavior and reduce the risk of cardiovascular diseases [1].

Perceived susceptibility and severity can provide a drive for behavioral change but cannot guarantee that specific actions will be taken. Taking action depends on the belief in the efficacy of those actions in reducing the chances of disease or the perceived benefits of certain health-related actions. In other words, perceived severity and susceptibility alone cannot create behavioral changes unless certain actions are proven to be applicable and beneficial [23].

Perceived benefit is one of the personal factors which shows people's understanding of the benefits and advantages of certain behaviors. The mean perceived benefit score in our study was 63.68 ± 13.19 , while the mean score for perceived barriers was 59.46 ± 15.83 . This shows that the participants had positive attitudes toward the benefits of following healthy nutrition tips, i.e., improving the function of cardiovascular and digestive systems, preventing various diseases, and being cost-effective. Studies show that perceived benefits can facilitate subsequent actions and that there is a strong relationship between perceived benefits and following preventive behaviors [13]. The mean score for the perceived benefit dimension in our study was similar to the results reported in other studies [14, 17, 21-22].

On the other hand, if perceived barriers are stronger than perceived benefits, behavioral changes may be hindered [24]. People's actions are determined based on the balance between perceived positive and negative forces affecting their health behavior. In this pattern, people's actions are defined by benefits minus possible barriers, and people should consider the consequences of actions and potentially negative

results. Mistakes in cost-benefit analysis happen when people weigh the benefits of actions against possible barriers such as high cost, risks, unpleasantness, and time [25].

It is necessary to increase awareness by introducing healthy and unhealthy foods regarding cardiovascular diseases and increase women's knowledge so that they can inform other family members about the risks of certain foods. In this regard, one study reported that a lack of familiarity with correct nutrition patterns was the most important barrier to making new diet choices [26]. Another study reported that lack of catering to different tastes, cultural factors, economic factors, and lack of access to healthy foods at all times of the year were among the important barriers to developing diets that prevent cardiovascular diseases [27].

It is also necessary to pay attention to barriers to preventive behaviors, especially in women, because lack of knowledge about these barriers and their persistence can reduce or even remove many healthy behaviors from people's lifestyles. Identification of perceived barriers helps scholars and health care planners to design suitable methods to promote preventive, healthy behaviors and improve public health.

The mean score for perceived self-efficacy in the present study was lower than average, meaning that the participants did not believe to be able to follow heart-healthy nutrition tips. Similar findings were reported in two other studies [14, 17]. Perceived self-efficacy is one of the key factors in the adoption of safe behaviors, and there is a strong correlation between perceived self-efficacy and preventive behaviors [28-29].

In the current study, there were no significant relationships between demographic factors and the dimensions of the health belief model, which is almost similar to the results of the study by Ghahroudi et al, who only reported a direct association between participants' age and perceived severity [1]. Similar results are also reported in other studies [11, 30].

Differences in the mean scores for the dimensions of the health belief model between participants with and without a diet history were not significant. There was also no significant difference between the mean scores of participants with and without a family history of cardiovascular disease ($p > 0.05$). The results of our study showed no significant relationship between the educational level of participants and their awareness and dimensions of the health belief model, which is similar to the results

reported by Ghahroudi et al [1]. However, another study reported a direct relationship between educational level and awareness of participants [15]. The reason for this difference can be attributed to the greater homogeneity of educational level in our study compared with the study by Ghahroudi et al. Since our study was conducted in a smaller scale and only in literate housewives, its results may not be generalized to all women in the population, especially to illiterate women, which is one of the weaknesses of our study.

Conclusion

Given that in any society, women are a useful channel for distribution of nutritional information and reinforcing positive attitudes toward healthy foods and that the women in our study were found to have an average level of awareness of cardiovascular diseases, it is necessary to consider the design and implementation of educational interventions based on theories and patterns of health education in order to increase awareness of factors related to cardiovascular diseases, such as nutrition, smoking, physical activity, and stress. Similar studies can help to develop effective prevention programs to reduce the number of people suffering from cardiovascular conditions.

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Conflict of interest

None of authors have conflict of interests.

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References

- Ghahroudi S, Bondarianzadeh D, Houshiar-Rad A, Naseri E, Shakibazadeh E, Zayeri F. Relationship between perception of cardiovascular disease risk based on the health belief model and food intake in a group of public employees in Tehran, 1391. *Iranian Journal of Nutrition Sciences & Food Technology*. 2013;8(3):55-64.
- Prabhakaran D, Jeemon P, Goenka S, Lakshmy R, Thankappan K, Ahmed F, et al. Impact of a worksite intervention program on cardiovascular risk factors: a demonstration project in an Indian industrial population. *Journal of the American College of Cardiology*. 2009;53(18):1718-28.
- Karimi Zarchi AA, Naghi'ei MR. Prevalence of risk factors of coronary heart disease and effect of life-style modification guides. *Kowsar Medical Journal*. 2009;14(3):57-162.
- Safarian M, Shojaeizadeh M, Ghayour Mobarhan M, Esmaili H, Nematy M, Razavi A. Investigation of dietary patterns, healthy eating index and traditional risk factors of cardiovascular disease in 35-65 years old adults of Mashhad. 2013.
- Majde TZ. Role of antioxidants in prevention of cardio-vascular diseases. *Journal of Nursing & Midwifery Gilan*. 2006;58(16):34-8.
- Retelny VS, Neuendorf A, Roth JL. Nutrition protocols for the prevention of cardiovascular disease. *Nutrition in Clinical Practice*. 2008;23(5):468-76.
- Sanderson SC, Waller J, Jarvis MJ, Humphries SE, Wardle J. Awareness of lifestyle risk factors for cancer and heart disease among adults in the UK. *Patient education and counseling*. 2009;74(2):221-7.
- Keyserling TC, Hodge CDS, Jilcott SB, Johnston LF, Garcia BA, Gizlice Z, et al. Randomized trial of a clinic-based, community-supported, lifestyle intervention to improve physical activity and diet: the North Carolina enhanced WISEWOMAN project. *Preventive medicine*. 2008;46(6):499-510.
- Pawlak R, Colby S. Benefits, barriers, self-efficacy and knowledge regarding healthy foods; perception of African Americans living in eastern North Carolina. *Nutrition research and practice*. 2009;3(1):56-63.
- Esmailzadeh A, Azadbakht L. Food intake patterns may explain the high prevalence of cardiovascular risk factors among Iranian women. *The Journal of Nutrition*. 2008;138(8):1469-75.
- Winham DM, Jones KM. Knowledge of young African American adults about heart disease: a cross-sectional survey. *BMC Public Health*. 2011;11(1):248.
- Alidosti M, Sharifirad GR, Hemate Z, Delaram M, Najimi A, Tavassoli E. The effect of education based on health belief model of nutritional behaviors associated with gastric cancer in housewives of Isfahan city. 2011.
- Alidosti M, Sharifirad GR, Golshiri P, Azadbakht L, Hasanzadeh A, Hemati Z. An investigation on the effect of gastric cancer education based on health belief model on knowledge, attitude and nutritional practice of housewives. *Iranian journal of nursing and midwifery research*. 2012;17(4):256
- Alidosti M, Delaram M, Reisi Z. Impact of

- education based on health belief model in Isfahanese housewives in preventing H. pylori infection. *Journal of Fasa University of Medical Sciences*. 2012;2(2):71-7.
15. Ammouri AA, Neuberger G, Mrayyan MT, Hamaideh SH. Perception of risk of coronary heart disease among Jordanians. *Journal of clinical nursing*. 2011;20(1-2):197-203.
 16. Salehi L, Haidari F. Efficacy of PRECEDE model in promoting nutritional behaviors in a rural society. *Iranian Journal of Epidemiology*. 2011;6(4):21-7.
 17. Tavassoli E, Hasanzadeh A, Ghiasvand R, Tol A, Shojaezadeh D. Effect of health education based on the Health Belief Model on improving nutritional behavior aiming at preventing cardiovascular disease among housewives in Isfahan. *Journal of School of Public Health and Institute of Public Health Research*. 2010;8(3):12-23.
 18. Sabzmakan L, Hazavehei SMM, Hassanzadeh A, Rabiee K. Effect of health education program on the depression of patients after coronary artery bypass surgery. *J Fundam Ment Health*. 2009;11(1): 61-68.
 19. Shahbazi H, Mazloomi Mahmoodabadi SS, Mobasheri M, Mozaffari Khosravi H, Karimi M, Esmail A. Education effect on knowledge and attitude of chefs of hotels and restaurants in Yazd to prevent risk factors of cardiovascular diseases in 2012. *Journal of Health* 2015; 6(1): 86-101.
 20. Tavassoli E, Reisi M, Javadzade H, Mazaheri M, Gharli pour Z, Ghasemi S, et al. The effect of the health belief model-based education & improvement of consumption of fruits and vegetables: An intervention study. *Journal of health in the field* 2013; 1(2): 29-35.
 21. Ghaffari M, Tavassoli E, Esmailzadeh A, Hasanzadeh A. The effect of education based on health belief model on the improvement of osteoporosis preventive nutritional behaviors of second grade middle school girls in Isfahan. 2011.
 22. Sharifirad G, Entezari MH, Kamran A, Azadbakht L. The effectiveness of nutritional education on the knowledge of diabetic patients using the health belief model. *Journal of research in medical sciences: the official journal of Isfahan University of Medical Sciences*. 2009;14(1):1.
 23. Glanz KA, Rimer BA, Viswanath K. *Health Behavior and Health Education Theory, Research and Practice*. 4th ed. San Francisco: Jossey – Bass publisher; 2008: 25-175.
 24. Karimy M, Niknami SH, Amin Shokravi F, Shamsi M, Hatami A. The Relationship of Breast self-examination with Self-esteem and Perceived Benefits/Barriers of Self-efficacy in Health Volunteers of Zarandieh city. *Iranian Journal of Breast Disease* 2009; 2 (2):41-48.
 25. Rahaei Z, Morowatisharifabad MA, Zareiyan M, Shojaefard J, Lesan S. Perceived benefits and barriers of preventive behaviours of relapsed myocardial infraction. *J Gorgan Uni Med Sci*. 2011; 13 (2):117-122.
 26. Moynihan P, Mulvaney C, Adamson A, Seal C, Steen N, Mathers J, et al. The nutrition knowledge of older adults living in sheltered housing accommodation. *Journal of human nutrition and dietetics*. 2007;20(5):446-58.
 27. Folta SC, Goldberg JP, Seguin R, Reed PN, Nelson ME, Lichtenstein AH. Factors related to cardiovascular disease risk reduction in midlife and older women: a qualitative study. *Preventing chronic disease*. 2008;5(1)
 28. Mazloomi S, Mirzaei A, Afkhami Ardakani M, Baghiani Moghadam M, Fallahzadeh H. The role of health beliefs in preventive behaviors of individuals at high-risk of type 2 diabetes mellitus. *SSU_Journals*. 2010;18(1):24-31.
 29. Mehri A, Mohaghegh NM. Utilizing the health belief model to predict preventive behaviors for heart diseases in the students of Islamic Azad University of Sabzevar (2010). 2010.
 30. Lefler LL, JAH CMF. Perceived cardiac risk among older, high-risk black and white women. *Southern Online Journal of Nursing Research*. 2009;9(3):1-13.