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The Effect of Education on Improvement of Preventive Behaviors of Cardiovascular Diseases among Yazd City Restaurants` Master Chefs

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Abstract

Aim: Cardiovascular diseases (CVDs) are the main contributor to disability and the leading cause of death in Iran and worldwide. This study was done to determine the effect of education on behaviors related to CVDs among Yazd city restaurants` chefs.

Method: In an experimental study, the intervention factor for case group was education through lectures, pamphlets, and videos. All the restaurant and hotel chefs of Yazd were divided into two groups: intervention and control (each group 39). Data were gathered through a researcher-made questionnaire with confirmed validity and reliability. All registered data were transformed to the SPSS program and analyzed under Mann-Whitney's U, Wilcoxon's, McNemar's, Marginal homogeneity, Spearman's correlation, and Chi-square tests.

Findings: Before training, the average scores of knowledge, attitude and practice had no significant differences between the case and control groups ($p \geq 0/05$), but this difference was significant immediately and three months after education ($p < 0/05$). Significant differences were observed in the scores of the knowledge and attitude of the intervention group between prior and immediately and three months after education ($p < 0/05$). Also three months after the intervention, the mean score of practice was increased in the intervention group. The main information source of the subjects was media (63.5%) with physicians being their preferred source (62.2%).

Conclusion: According to the average knowledge of chefs before the intervention and significant role of chefs on cardiovascular health, improving their information through regular training programs (in consultation and health education centers), posters, pamphlets, and media is suggested.

Keywords: Education, Prevention, Cardiovascular diseases, Chef

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Introduction

Cardiovascular diseases (CVDs) are progressive chronic diseases; their process may start from childhood but their clinical manifestations will be uncovered until adulthood [1]. There are different types of CVDs like coronary artery diseases, cerebro-cardiovascular diseases, heart failure, peripheral cardiovascular diseases, etc. [2, 3]. Most countries in the world are involved in the pandemic of CVDs [4]. Although a lot of CVDs are controllable or even treatable [5], they are the leading cause of mortality in the world [6-10] as 30% of all 58 million estimated deaths in 2005 were due to CVDs [11]. The mortality portion of CVDs at the start of the 20th century was 10% of all deaths, but at the end of the century, this rate had been increased to 25% [12]. Now CVDs are responsible for about 17 million deaths annually [1, 13], and if policy makers do not design preventive programs, this rate will be increased to 24.8 million till 2020 [14].

American heart association (AHA) reported that more than 2.5 million people are now suffering from heart failure and that 550,000 new cases will be added to these patients [14]. In 2012, cardiovascular deaths represented 31% of all global deaths [15].

Gersh et al. placed the Middle East as region where 35-65% of all deaths are due to CVDs [7]. CVDs are the most important cause of death in Iran too [16, 17]. In 2001, in 18 provinces of Iran, CVDs were responsible for about 465 of the deaths [14], and in 2006, they were responsible for 167.7 per 100,000 deaths [6]. Now, 360 deaths out of 800 fatalities in Iran are due to CVDs [18].

Risk factors of CVDs are different: sex, age, diabetes, high cholesterol, hypertension, smoking, alcohol use, obesity, sedentary life, positive family history, etc. Most of these are preventable [19, 20]. The most important point of controlling CVDs in the developed countries is the diagnosis and control of risk factors [21]. The major effort of policy makers is to prevent CVDs not the treatment of the disease [22]. With the national effort of health staffs, we can prevent more than 50% of the mortality and morbidity due to CVDs by effective simple and low-cost programs [23].

Unhealthy nutrition is one of the most important causes of CVDs [24], and based on some studies [22, 26, 27], the tendency of people to consume foods in restaurants is increasing. This issue shows the important role of chefs in cooking and serving healthy foods. They can maintain the taste and aroma of foods, but at the same time, add a fiber like vegetables and fruits and lower the fats of foods and then help to decrease the total calories of serving food [28]. Total fat in food can be decreased from 57% to 30% without any sense of change in the natural taste and

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aroma of food [25].

The results of the studies conducted in Iran show a low level of knowledge and practice of risk factors for CVDs among people [22]. In order that people tend to healthier life, it is needed to change their behavior [29], and health education in this way has a key role [30]. The main goal of health education is to change unhealthy behaviors by the people's own partnership [23]. Policy makers must accept this fact that they can prevent CVDs by low-cost interventions and lower the risk factors of CVDs instead of expensive treatments after stabilization of the disease [31].

In a study titled: "Diet-related risk factors of cardiovascular diseases: comparison of two occupational groups", it was revealed that the chefs are at greater risk for CVDs and that quality of foods that are served in restaurants reflects the knowledge and practice of chefs and staffs of the restaurant [32]. Then the present study was done to determine the effect of education on behaviors related to CVDs among Yazd City restaurants` chefs.

Materials and Methods

This experimental study was done during September 2011 to February 2012 in Yazd City, Iran. Interventional methods were educated using lecture, poster and film. All chefs of the restaurants and hotels Yazd City were included in this study. The names of hotels and restaurants were taken from Yazd City's Central Health Management Center, and the chefs were divided into two groups using tables of random numbers. Totally, 79 chefs were divided into two groups with 39 cases. During the study, three chefs discontinued the study and were excluded. A written consent was taken from each chef, and the process of the study was explained for all participators during a session before starting the project. We assured them that their replies will be secret and their scores will not be reported to their employer and will not affect on their job. The content validity of the questionnaire was confirmed by the judgment of a panel of eight experts in medical education, and the construct validity of the questionnaire was determined by factor analysis. Cronbach's alfa coefficient revealed an acceptable degree of internal consistency (0.75). The reliability of the questionnaire was measured by test-retest (0.8).

Pretest questionnaire consisted of questions about demographic variables and also specific questions to evaluate knowledge, attitude and CVDs' preventive behaviors before the intervention. The questionnaire was completed by three educated students of public health; each interviewer had a specific core written on the top of the questionnaire.

For the intervention group, the times of the

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sessions were determined in consultation with the restaurant and hotel managers and chefs, and a letter about the agreed time was posted to their addresses. Also an SMS was sent to each chef and manager one day before each class for remembrance.

Before entrance to the class, an educational package including poster and educational film about CVDs, as well as some white papers and a pen for noting during the class were given to the subjects. Contents of the education program were taken from analyzing the data of pre-test study and training needs assessment. Education was designed in two-week programs. It was asked from the subjects to check and view the film and poster at home. For each subject in the intervention group, the questionnaire was completed at two times, immediately after the education program, and three months after the education. The first questionnaire included knowledge and attitude questions, and the second consisted of knowledge, attitude and preventive behaviors.

Post-test questionnaires of the control group were completed at the same times with the intervention group.

The demographic information of questionnaire included age, height, weight, graduation, diabetes, HTN or hyperlipidemia, health status (four levels from good to bad), and exposure to stress in daily life (four levels from never to always). Also 29 questions about knowledge of causes, symptoms and risk factors of CVDs, 14 questions on attitude and 12 questions on practice evaluation (such as physical activity, smoking, testing sugar, testing cholesterol, testing the weight, using fruits and vegetables, …) were designed.

For knowledge, the possible obtainable score range was 0-29 (false question 0 and right question 1 score). For attitude, the questions were designed based on three-point Likert scale (from agreeing to disagree, and scores from 0 to 2) and possible obtainable score range was 0-28. In practice, each subject could gain 0-14 scores, good practice got score 1, moderate got 0.5 and bad practice got score 0.

All registered data were transformed into the SPSS 16 software and analyzed under Mann-Whitney's U, Wilcoxon's, McNemar's, Marginal homogeneity, Spearman's correlation and Chi-square tests.

Results

Totally, 75 chefs were included in the study (26 in the intervention group and 29 in the controls). Mean age of the participants was 26.17±7.4 years. About 12.9% of the participants were obese (BMI≥30), 30% were overweight (25≤BMI≤29.99) and 57.1% had normal BMI (18.5≤BMI≤24.99). 9.3% were illiterate, 52% were under high school diploma, 36% had high school diploma, and 2.7% had academic graduations. About 17.3%

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of the subjects had positive family history of CVDs and 40% mentioned that there is at least one smoker in their first degree relatives. History of HTN, diabetes and hyperlipidemia was seen in 6.7%, 2.7% and 9.3% of the Yazd restaurant chefs, respectively. About stress, 12% of the participants reported that they have no stress during daily works, 32% reported low, 40% moderate and 16 high levels of stress. Their income was totally satisfactory for about 22.7%, somewhat satisfactory for 56% and unsatisfactory for 21.3%. Based on our results, 13.3% of the subjects evaluated their health status as very good, 34.7% good, 44% moderate and 8% as bad. There was no significant difference between the two groups according to the demographic variables listed above (P>0.05).

Based on Mann-Whitney's U test, in the fields of knowledge and attitude, there were no significant differences between the two groups before the intervention. But during ``immediately`` and ``three months after education`` analysis, significant difference in knowledge and practice scores was seen (P<0.0001); however, for attitude, it was not significant (P>0.05). Analysis within each group showed that in the intervention group, mean score for knowledge immediately after intervention was increased by 4.62 scores (P=0.001). Three months after intervention, it was decreased by 0.34 scores contrasting with the immediately after intervention scores, but it was not significant (P=0.475) (Table 1).

Table 1: Comparison of the mean scores of knowledge, attitude and practice before, immediately and three months after education between the intervention and control groups

Variables \ Groups		Case			Control		
		Mean	SD	P	Mean	SD	P
Knowledge	Before education Immediately after education	19.42 24.3	5.07 3,68	0.0001	19.44 19.73	3.9 3.92	0.062
	Before education Three months after education	19.42 23.69	5.07 3.69	0.0001	19.44 19.49	3.9 4.06	0.717
	Immediately after education Three months after education	24.03 23.69	3.68 3.69	0.475	19.72 19.49	3.92 4.06	0.256
Attitude	Before education Immediately after education	23.25 25.97	5,88 2.98	0.0001	24.46 19.72	4.06 3.36	0.063
	Before education Three months after education	23.25 25.56	5.88 2.84	0.017	24.46 24.56	4.06 3.83	0.052
	Immediately after education Three months after education	25.97 25.56	2.98 2.84	0.032	24.77 24.56	3.36 3.83	0.063
Practice	Before education Three months after education	7.97 9.43	2.37 1.74	0.0001	8.11 8.23	1.85 2.07	0.233

McNamara's test showed that the mean scores of knowledge about symptoms of CVDs like Myocardial Infarction (MI), cough and fatigue have increased significantly (P<0/05) but they

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were not significant about symptoms like chest pain and dyspnea (P=0/549) (Table 2).

Table 2: Comparison of the correct answers to cardiovascular diseases symptoms before, immediately and three months after training in the intervention group

Symptoms	Time of study	Correct answers		P
		N	%	
Chest pain	**Before education**	21	58.3	0.549
	Immediately after education	24	66.7	
	Before education	24	66.7	0.145
	Three months after education	19	52.8	
Change in heart rate	**Before education**	26	72.2	0.021
	Immediately after education	34	94.4	
	Before education	34	94.4	1.000
	Three months after education	33	91.7	
Dyspnea	**Before education**	24	63.9	0.388
	Immediately after education	27	75	
	Before education	27	75	0.500
	Three months after education	25	69.3	
Myocardial Infarction (MI)	**Before education**	18	50	0.008
	Immediately after education	30	83.3	
	Before education	30	83.3	1.000
	Three months after education	31	86.1	
Cough	**Before education**	7	19.4	0.002
	Immediately after education	17	47.2	
	Before education	17	47.2	1.000
	Three months after education	18	50	
Tiredness	**Before education**	9	25	0.039
	Immediately after education	16	44.4	
	Before education	16	44.4	1.000
	Three months after education	17	47.2	

The results showed that education had a significant effect on the knowledge of chefs about some risk factors of CVDs like consumption of red meat, saturated oils, family history, male sex, hyperlipidemia and animal oils, immediately after education (P<0/05) but it has no significant effect about some other risk factors was not increased not immediately nor three months after intervention (P≥0/05) (Table 3).

Before intervention, 38.9% of the participants knew that CVDs are the leading cause of mortality among adults; however, immediately after intervention, 75% (P=0.002) and three months after intervention, 83.3% had knowledge about this fact.

Table 1 presents that the mean score of attitude in the intervention group has increased by about 2.72 scores immediately after intervention (p<0.001) and decreased by about 0.41 scores comparing with the immediately after intervention (p<0.032). Due to the structure of attitude questions (three point for each question), Marginal Homogeneity test was used

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for analysis; the results showed that in five questions of the total of 14 questions, differences between before and immediately after the intervention were significant.

Table 3: Comparison of the positive practice of the participants before and three months after the training

Variables	Time of study	Correct answers		P
		N	%	
Physical activity	**Before education**	8	22.2	0.25
	Three months after education	10	27.8	
Smoking	**Before education**	29	60.6	1.00
	Three months after education	30	83.3	
Blood pressure	**Before education**	15(41.7) good, 16(44.4) moderate		0.180
	Three months after education	14(38.9) good 15(41.7) moderate		
Testing sugar	**Before education**	17	47.2	0.031
	Three months after education	23	63.9	
Testing cholesterol	**Before education**	19	52.8	0.031
	Three months after education	25	69.4	
Testing the weight	**Before education**	30	83.3	0.500
	Three months after education	32	88.9	
Action for weight control	**Before education**	12(33.3) good, 5(13.9) moderate		0.052
	Three months after education	15(41.7) good, 6(16.7) moderate		
Adding salt to food before tasting it	**Before education**	28	77.8	1.00
	Three months after education	29	80.6	
Using unsaturated oil for cooking	**Before education**	32	88.9	1.00
	Three months after education	33	91.7	
Making low- fat foods	**Before education**	18(50) good, 14(38.9) moderate		0.059
	Three months after education	22(61.1) good, 11(30.6) moderate		
Using white beef	**Before education**	7(19.4) good, 25(69.4) moderate		0.020
	Three months after education	12(33.3) good,22(61.1) moderate		
Using fruits and vegetables	**Before education**	4(11.1) good, 18(50) moderate		0.007
	Three months after education	2(5.6) good, 25(69.4) moderate		

Also the scores of practice three months after intervention increased significantly in the intervention group compared to before intervention ($p<0.001$). There were significant relationship between age and knowledge before ($r=0/401$, $p<0.015$) and immediately after intervention ($r=0/463$, $p<0.004$), knowledge before education with knowledge immediately ($r=0/660$, $p<0.0001$) and three months after education ($r=0/503$, $p<0.002$), knowledge immediately after with knowledge three months after education ($r=0/848$, $p= 0/0001$), attitude before with attitude immediately ($r=0/390$, $p<0.019$) and three months after education ($r=0/517$, $p<0.001$), attitude immediately after with attitude three months after education ($r=0/882$, $p<0.0001$), and also practice before with three months after education ($r=0/789$, $p<0.0001$).

The most important source of information for the chefs was media (63/5%), and their preferable source was physicians (62/2%).

Discussion

Education can increase the knowledge, but maintaining the level of this awareness is

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important [33]. For planning and increasing the knowledge of people about CVDs, we need to have a complete knowledge on the level of awareness [23]. The results of this study showed that before education, the knowledge of participants in the intervention group about prevention of risk factors of CVDs was moderate that increased after education and did not decrease after three months. The data from two studies were same as the results of our study, indicating that the knowledge was at a moderate level [34, 35]. The results of a study by Gorleku in the USA showed that the knowledge of participants was good. The responses of the chefs and participants in this study suggested that more information on less-costly and time-consuming ways of practicing good nutrition and a healthy lifestyle would assist employees in the SNO to effectively incorporate healthy eating habits into their work lives. These results reveal that the awareness of chefs in the developed countries is better than in the developing countries [25]. In another study by Angeles [33], education by lecturing increased the knowledge of participants, but decreased after one month, unlike our results in the intervention group. This can be explained by the fact that in the present study, lectures, and educational pamphlets and videos were used. Also we asked the chefs to see the film in their free times more and try to use its recommendations in their work that this caused them to maintain information much time.

More than 90% of the participants knew that smoking, no exercise, obesity and overweight, diabetes, stress and blood pressure are strong risk factors of CVDs. About 43% of the chefs were fat and overweight, and only 22% of them used to do exercise. The results of Nouri's study showed that obesity and overweight in male adults were 13.5% and 39.5%, respectively [36]. Most of the participants did not know that animal fats, sex and positive family history are important risk factors of CVDs. With planning the education based on their needs, their knowledge increased and did not decrease after three months.

The attitude of participants toward the effect of nutrition in CVDs was good and we did not find a significant difference in the participants' scores immediately after the educational intervention and three months later. In a study, the attitude of participants was not good and they did not try to give healthy foods to the customers [25]. The participants had an overall moderate level of knowledge and practice. More than 86% of the participants knew that smoking is a risk factor for CVDs and more than 36% of them were smokers. Our education did not decrease their smoking rate. In a study by Hurtung, the chefs involved in the study carried a higher risk of CVDs than

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the comparison group of office workers. The nutritional behavior of chefs such as consuming foods rich in fats, particularly of animal origin, is associated with higher TC and Apo B and higher rates of SFAs in the red blood cell membranes as well as higher concentrations of uric acid. In addition, there were more smokers in the chef group [32].

Results from the present study suggested that more than 77% of the chefs in the intervention group knew that salt is a risk factor for CVDs and about 22% of them used to add salt to food before tasting it, and education did not change their practice. The results of Adili showed that about 78% of the participants knew that salt is a risk factor for CVDs and more than 31% of them added salts to their food before tasting it [22].

The data of this study showed that 72% of the chefs knew that saturated oils are not good and are risk factors for CVDs and more than 80% of them knew that margarine oil is better than other oils. More than 10% of the chefs used saturated oil. The cause of using saturated oil was lower cost and lack of knowledge on the side effects of such oils. The results of Adili et al. showed that about 74% of the participants knew that margarine oil is better [32]. In 2000, Heydari et al. in Iran concluded that 89% of the participants knew that using margarine oil is more suitable, and 38% of them used margarine oil [37].

Before education, more than 61% of the chefs used vegetables and fruits that even immediately and three months after education, it increased to 75% ($P<0.05$).

Conclusion

Based on the study results, through précised designed educational programs, we can increase the chefs' level of knowledge and attitude. Considering the important role of chefs in making healthy foods for people, it is suggested to design constant periodic educational programs and evaluating their level of knowledge in intermittent sessions. The preferable sources for education, face- to-face educational sessions, posters, pamphlets, media and physicians appear to be a particularly effective combination of strategies.

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Conflicts of interest

None has been declared.

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