Health Education and Health Promotion (HEHP) (2016) Vol. 4 (2)

Effect of Healthy Nutrition Education on the Body Mass Index (BMI) of Health Volunteers in Ilam Province

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Abstract

Aim: This study was conducted to evaluate the impact of healthy nutrition education on the body mass index (BMI) of health volunteers in Ilam Province, Iran.

Methods: In this quasi-experimental study, two cities of Ilam Province were randomly selected and their active health volunteers (n = 70) were randomly placed in two groups of experimental and control after providing written informed consent. Data were collected by using the valid (by a panel of experts) and reliable (by Cronbach's alpha coefficient of 0.92) questionnaire (developed by the researcher) and standard equipment and methods at two stages: before and six months after the intervention. The experimental group participated in a one-day training workshop with an emphasis on increasing the knowledge of participants in the field of obesity and its problems. Data were analyzed using SPSS19 and the statistical tests, Chi-square test and T-test.

Findings: The mean of BMI in the experimental group decreased significantly by 2.4 after intervention and reached to 25.1 ± 1.8, but there was no decrease in BMI mean in the control group. In the experimental group, the relationship between age and education level and weight loss was not significant, but the relationship between weight loss and having a BMI above 25 was significant.

Conclusion: Weight loss in the experimental group compared to the control group suggests the impact of the intervention of the education; however, its difference between the existed weight loss standards imply that the education for nutrition just for modifying BMI was not enough.

Keywords: Health education, Healthy nutrition, Body mass index (BMI), Health volunteers

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Introduction

Obesity is increasing as one of the important health problems all over the world [1]. It is among the major causes of death in the developed countries and among affluent classes of developing countries [2], a kind of increase, which is due to change in people's lifestyle [3]. Obesity has different types of complications such as cardiovascular diseases, hypertension, increased risk of getting type II diabetes, gallstone, increase in the blood insulin, asthma, orthopaedic diseases, infertility, cancer and sudden death. Also getting fat during adolescence will cause depression, anxiety, and discrimination in the social and work environments [4]. Therefore, in order to decrease the complication of death related to obesity, its prevention enjoys high priority [5]. The prevalence of obesity among European adults is around 10 to 25% [6], and in Iran is 22.3% [7]. Of course, scrutinizing the prevalence of obesity in different areas of the country has yielded different results from 8.5% to 40.3% [8-11].

BMI (Body Mass Index), obtained with weight divided by height squared (Kg / m^2), is one of the most common anthropometric methods of obesity diagnosis. People with BMI less than 18.5, 18.5 to 24.9, 25 to 29.9, and higher than 30 are considered thin, having healthy weight, overweight and obese, respectively [12, 13]. The World Health Organization (WHO) has announced the inactive lifestyle and using diet high in fat and calories as the main reasons for epidemic obesity [14]. Some researchers recommend evaluating diet model to manage and cure obesity [15, 16]; some studies could achieve beneficial results in improving health index in overweight people by executing regular educational plans in the form of holding educational meetings with regular intervals and intermittently with varieties of teachings including promotion of self-consciousness, teaching physical activities, modifying eating habits and diet therapy [17]. Educational intervention is also economical. In other words, each dollar spent on education leads to 3 to 4 dollars saving in the health – treatment expenses of the society [18].

The effect of using health volunteers to promote the health behavior of the community has been reported by many studies [19–21]. In general, health volunteers are interested, and active and social ladies inclined to have more active role in promoting their own, their families and neighbours' health. Volunteers cover their neighbours and bear the responsibility of receiving and transferring the required training from health staff to cover households. In fact, health volunteers act as a bridge between the people of the community and health centers, and their awareness and behavior can influence on both households and society [22, 23].

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Therefore, the researchers went on to form a research plan to examine the impact of healthy diet training on BMI to possibly use the obtained results to improve the situation of the society.

Objective

This study aimed to evaluate the impact of healthy nutrition education on the BMI of health volunteers' behavior in Ilam Province.

Materials and Methods

This quasi-experimental study was conducted among health volunteers in Ilam Province. Two cities (Dehloran and Abdanan) were randomly selected and all the active health volunteers in their health centers were divided into two experimental and control groups after presenting an informed consent form. The active health volunteers of the central towns of Dehloran were 34 people, as an experimental group and the active health volunteers in the central towns of Abdanan were 36 people, as the control group, which all were included in the study. The homogeneity of the groups in terms of age, gender (all were female), education and BMI>25 was evaluated and confirmed.

Health volunteers consisted of interested mothers who work together with the health system for years in order to promote public health in our country. These people are part of the households covered by each service provider and cooperate with the health system voluntarily to improve their health, family and neighbourhood [24].

Active volunteers were also selected based on the checklist completed by the educators of this program in the health centers in which the performance of these volunteers in the fields such as active participation in classes, transferring the messages to family and close cooperation with the health unit was scored; accordingly, all those health-care volunteers, who regularly attended the classes and have had permanent cooperation with the health centers, were invited for the study.

The instrument of collecting data in this study was a researcher-made questionnaire with which the demographic characteristics and BMI of the participants were collected. Measuring the participants' height was done by a stadiometer SECA model with the accuracy of 1 mm in a standing position without shoes while the back of the feet, hips, shoulders and then the head was overlapped with the vernacular surface. In addition, measuring the weight was done by a SECA model digital scale with the accuracy of 0.1 kg without shoes and the least amount of clothes. All the measurements were done by a single person and one device. Then the BMI of the participants was calculated and recorded in the questionnaire of each person.

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This study is part of a research project, KAP study type, and its content validity was confirmed by a panel of experts (professionals in the field of health & nutrition education). The last part of questionnaire was also examined on a group of 20 health-care volunteers (non-participants), and the result of Cronbach's alpha test was 0.92.

The educational intervention for the experimental group in this study was a one-day workshop held in three parts:

In the first part, the participants received complete information about a variety of food groups, in gradients and their roles in the body. In the second part, the participants received comprehensive information regarding the problems and diseases associated with obesity. In the third part, the health volunteers got familiar with a number of calories obtained from the consumption of each group of food, the method of organizing particular diet for themselves, obesity and the way of determining it using BMI as well as its interpretation. PowerPoint training, group discussion and lecturing were used in this training workshop.

By the way, the participants' BMI was measured and their diets were managed practically. They received the answers to their questions at the end of the session. At the end of the intervention, each participant received a package including educational printed texts and CDs. However, the health volunteers, who were members of the experimental group, could (if they were intended) refer to a nutritionist in order to arrange their diets. The experimental group received short messages during the follow-up in addition to attending a one-day workshop. The experimental group was asked to maintain their physical activities at least before the intervention level. In the post-test stage, the participants were asked not to report any cases in case of failure to comply with this case.

To determine the descriptive purposes of the study, the calculation of frequency, mean and standard deviation was used based on the kind of the variables. Also to determine the referential purposes about the quantitative and qualitative variables, t-test and Chi-2 were used. In order to decide about the existence of any relationship, the amount of P less than 0.5 was extrapolated. The SPSS software (ver.19) was used in order to analyze the data. Participating in this study was bound to a written conscious consent of the participants; the research group was commented to keep all the information confidential during the study and publication of the results. This article is the outcome of part of the results of the research plan proposed and confirmed in the HSR council of the Medical Ethics Committee of Ilam University of Medical Sciences, Ilam, Iran.

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Results

All the participants in this study were female, and the average age of the members of the experimental and control groups was 31.05±4.68 and 31.14±4.71, respectively. 50% of the participants in the experimental group and 47.23% of the control group did not have any academic degrees. Statistical tests indicated no significant differences between the two groups. In other words, both groups were identical (more explanations Table 1).

Table 1: Frequency of demographic characteristics of the respondents

Age (Mean±SD)		Experimental group (N=34)		Control group (N=36)		P value	Statistical test
		Frequency	Percentage	Frequency	Percentage		
		31.05±4.67		31.14±4.71		0.471	Independent t-test
BMI over 25	Has	16	47.06	17	47.22	0.529	Chi-square test
	Doesn't have	18	52.94	19	52.78		
Education	Nonacademic	17	50	17	47.23	0.512	Chi-square test
	Academic	17	50	19	52.77		

Mean and standard deviation of the BMI of the participants in both groups before the intervention was 27.5±1.1 and 27.2±1.7, respectively. The BMI of the participants after the intervention in the experimental group improved to 25.1±1.8, while the participants in the control group showed a slight increase (27.7±1.5) (Table 2).

Table 2: Comparison of the body mass index (BMI) of the two groups before and after the intervention

		Body Mass Index (BMI)		
		Mean±SD	P-Value	Test
Before training	Experimental group	27.5±1/1	0.572	Independent t-test
	Control group	27.2±1/7		
After training	Experimental group	25.1±1/8	0.002	
	Control group	27.7±1/5		

Before and after the intervention, the relationship between weight and age and education level was not significant in both groups, but there was a significant relationship between being married (direct relation) and having experience and history in the program of health-care volunteers in both groups before the intervention. In other words, married people with longer history in the program of health-care volunteers were heavier and had more weight. After the intervention and just in the experimental group, the relationship between being married and weight loss was significant.

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Discussion

Most of the researchers have unanimous ideas about the causes and complications of obesity [25, 26]; however, their ideas about the remedy and preventing obesity vary. In the present study, we tried to evaluate the impact of healthy nutrition training, suitable food model and creating the ability to manage diet on obesity through following the BMI.

Mean and standard deviation of the participants' BMI in both groups before the intervention was 27.5±1.1 and 27.2±1.7 respectively, which statistically did not have significant differences (P≥ 0.05). This fact, considering the homogeneity of the groups, was predictable. 47.06% of the participants in the experimental group and 47.22% of the control groups had the BMI over 25; it means that more than 47% of the participants in this study were overweight in different degrees. The results indicated that healthy nutrition and introducing appropriate diet model are very efficient in controlling weight and cause 2.4 decline of the BMI mean of those receiving the education (experimental group) during six months of intervention. Similar results were achieved in the studies conducted by Golshahi et al. [13], Javadi et al. [26], Nouri Tajer and Kordloo [27], Najimi et al. [28] and Bahraminejad et al. [29]. Mean and standard deviation of the BMI of the participants in the experimental group and control group after the intervention was 25.1±1.8 and 27.7±1.5, respectively, showing that the difference is statistically significant (P≤ 0.05).

In this study, the members of the experimental group had 6100 g weight loss on average; while the weight loss for those following the weight loss plan can be around 2 pounds (around 900 g) in a week; this means around 3 kg in each month [30]. Therefore, regarding the six-month follow-up in this study, around 18 kg weight loss could take place. The obtained results have a lot of differences with the standard. It seems that, considering the significant difference in the BMI of experimental group after the intervention, the created weight loss was not enough, and that the healthy diet per se is not enough to achieve considerable weight loss, and probably, other activities such as physical activity should be applied simultaneously to obtain a better result. Particularly, using nutritional training and physical activity have been shown to play a very important role in lose weight in different studies [31-33].

Limitation

Not using physical education and nutritional education simultaneously was one of the limitations of this study. Therefore, evaluating the results of nutritional education and physical education simultaneously on BMI will be the next study of the research team.

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Conclusion

Educational intervention in this study had a positive impact on decreasing the BMI of the health of volunteers. Therefore, it can be concluded that educational intervention might be very efficient to prevent overweighting and obesity. Considering the increasing trend of prevailing overweight and obesity in the country and the results of the present study, it is essential to pay more attention to education. Furthermore, based on the findings of this study, education alone to lose weight is not enough.

Conflict of Interest

The authors state that there is no conflict of interest.

Acknowledgements

The researchers consider it essential to thank wholeheartedly all the health volunteers participated in this plan.

Funding/Support

This study is the outcome of the educational plan of HSR NO. 909405 executed by the support and observation of the Research Deputy of Ilam University of Medical Sciences, Ilam, Iran.

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