



THE EFFECT OF NUTRITION AND EXERCISE EDUCATION ON THE DEVELOPMENT OF ATTITUDE AND BELIEF OF UNIVERSITY STUDENTS TOWARDS OBESITY: CASE OF ELAZIĞ PROVINCE

Üniversite Öğrencilerinin Şişmanlığa Yönelik Tutum ve İnançların Geliştirilmesinde Beslenme ve Egzersiz Eğitiminin Etkisi: Elazığ İl Örneği

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Abstract

In order to determine the effect of nutrition and exercise education on the development of students' attitudes and beliefs towards obesity, this study was conducted with a control group quasi-experimental pretest-posttest design. The research was conducted in the fall semester of the 2019-2020 academic year between October-November 2019. The study group consisted of 50 female students, 25 experimental (overweight or obese) and 25 control group (normal weight), studying at Fırat University Faculty of Health Sciences. In order to collect pretest data, a personal information form and Health Belief Model Scale in Obesity (HBMSO) were applied to the students in the experimental and control groups. Later, the students in the experimental group were taken to a 6 week program with 2 hours of healthy nutrition and exercise education per week. HBMSO, which was applied to the students in the experimental and control groups at the beginning of the study, was repeated at the end of the education, thus the posttest data were collected. When the before and after education HBMSO sub-dimension scores of the experimental and control groups were compared; The difference in the attitude to importance of health, perceived sensitivity, perceived severity, perceived usefulness and perceived disability dimensions in the experimental group was found to be significant ($p < 0.001$). HBMSO subscale scores of the control group did not show any difference ($p > 0.05$). As a result, after nutrition and exercise education given to obese students, a positive change was achieved in students' beliefs about obesity.

Keywords: Obesity, health belief model, university students.

Özet

Bu araştırma beslenme ve egzersiz eğitiminin öğrencilerin şişmanlığa yönelik tutum ve inançlarının geliştirilmesine olan etkisini belirlemek amacıyla, ön test-son test, kontrol grublu ve yarı deneysel olarak yapılmıştır. Araştırma 2019-2020 eğitim öğretim dönemi güz yarıyılında Ekim-Kasım 2019 tarihleri arasında yapılmıştır. Çalışma grubunu Fırat Üniversitesi Sağlık Bilimleri Fakültesi'nde okuyan, 25 müdahale (kilolu veya şişman) ve 25 kontrol grubu (normal kilolu) olmak üzere toplam 50 kız öğrenci oluşturmuştur. Ön-test verilerinin toplanmasında müdahale ve kontrol grubundaki öğrencilere kişisel bilgi formu ve Obesite Sağlık İnanç Modeli Ölçeği (OSİMÖ) uygulanmıştır. Daha sonra müdahale grubundaki öğrenciler 6 hafta süreli ve haftada 2 saatlik sağlıklı beslenme ve egzersiz eğitim programına alınmıştır. Müdahale ve kontrol grubundaki öğrencilere çalışmanın başlangıcında uygulanan OSİMÖ, eğitim sonunda tekrarlanarak son test verileri toplanmıştır. Müdahale ve kontrol gruplarının OSİMÖ alt boyut puanlarının eğitim öncesi ve eğitim sonrası karşılaştırılması yapıldığında; müdahale grubunun sağlığın önemi, algılanan duyarlılık, algılanan ciddiyet, algılanan yarar ve algılanan engel boyutlarında farkın anlamlı olduğu bulunmuştur ($p < 0,001$). Kontrol grubunun OSİMÖ alt boyut puanları farklılık göstermemiştir ($p > 0,05$). Sonuç olarak şişman öğrencilere verilen beslenme ve egzersiz eğitimi sonrasında öğrencilerin şişmanlığa yönelik inançlarında olumlu yönde değişim sağlanmıştır. Şişman ve şişmanlık riski bulunan kişilere sağlık inanç modeli temelli danışmanlık hizmetlerinin sunulması ve şişmanlığa yönelik tutum ve inançları değerlendiren başka çalışmaların yapılması önerilebilir.

Anahtar kelimeler: Şişmanlık, sağlık inanç modeli, üniversite öğrencileri.

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Introduction

Overweight and obesity are defined as abnormal or excessive fat accumulation that may impair health (1). Obesity occurs when energy intake exceeds its output for an extended period of time. This imbalance is fueled by economic growth, industrialization, mechanized transport, urbanization and a nutritional transition to processed foods which have led to sedentary life style and unhealthy eating pattern (2). Obesity affects life quality and disability of people, therefore, it can have negative and indirect influences on society (3). Being overweight is a major risk factor for many chronic diseases such as cancer, diabetes and heart disease, and as such overweight and obesity should be viewed as global public health concerns (4). Increasing prevalence of obesity, seen both in the developed and developing countries, is primarily driven by imbalanced diets and sedentary lifestyles. Sedentary lifestyle that is characterized by physical inactivity has been associated with adiposity and increased weight gain (5).

In the last decades, obesity has become a pandemic health issue across developing and developed countries worldwide. In 2016, more than 1.9 billion adults, 18 years and older, were overweight. Of these over 650 million were obese. 39% of adults aged 18 years and over were overweight in 2016, and 13% were obese. Most of the world's population live in countries where overweight and obesity kills more people than underweight (1).

According to the Turkey Health Survey 2019 data, the percentage of obese individuals aged 15 and older was 19.6% in 2016, increased to 21.1% in 2019. In terms of gender, in 2019, 24.8% of women were obese and 30.4% were pre-obese, 17.3% of men were obese and 39.7% were pre-obese (6).

Since the early 1950s, the Health Belief Model (HBM) has been one of the most widely used conceptual frameworks in health behavior research, both to explain change and maintenance of health-related behaviors and as a guiding framework for health behavior interventions. Over the past two decades, the HBM has been expanded, compared to other frameworks, and used to

support interventions to change health behavior (7). HBM aims to predict whether individuals choose to engage in a healthy action in order to reduce or prevent the chance of disease or premature death. The HBM addresses the effects of beliefs on health and the decision process in making behavioral changes (8).

The Health Belief Model argues that individuals' health behaviors will be affected by their beliefs, values and attitudes. If these beliefs and attitudes that are seen as problems are determined, the health education to be given or the treatment methods to be applied will be determined more suitable for that person. Identifying the perceptions underlying individuals' health-related attitudes and behaviors, and then correcting these identified wrong / missing aspects will put them into action. As a result, there will be more participation in early diagnosis and screening programs (9).

The transition from high school to college often results in drastic changes to environment and resources, and such changes likely impact health-related behaviors. Many studies have documented unhealthy behaviors among college students including decreased physical activity, increased rates of smoking and drinking, and decreased overall diet quality yet few studies have examined the change in behaviors that occur as students' transition from high-school to college (10). University students are quite vulnerable to obesity and overweight due to inadequate nutrition, and lifestyle, leading young people to conditions of potential cardiovascular risk (11).

In the prevention of obesity, it is necessary to increase the awareness of students about unbalanced nutrition and sedentary life issues, which are the leading changeable environmental risk factors. It would be beneficial to develop overweight and obese individuals' attitudes and beliefs about obesity and to support them with effective education. The main goal of this study is to determine the effect of nutrition and exercise education on the development of students' attitudes and beliefs towards obesity.

Material and Method

This research had a control group quasi-experimental pretest-posttest design, and was conducted between October-November 2019 in the fall semester of the 2019-2020 academic year. The research was carried out with a total of 50 female students, 25 experimental (overweight or obese) and 25 control group (normal weight), studying at the departments of nursing, midwifery, nutrition and dietetics of Firat University Faculty of Health Sciences. Information about the research was given in the classes and the students who wanted to participate in the research were determined.

Body Mass Index (BMI) is widely used to determine obesity. BMI is obtained by dividing the individual's body weight (kg) by the square of his/her height (m) ($BMI = \text{kg}/\text{m}^2$). Individuals were evaluated in two groups as overweight and obese, and normal according to their BMI values. ≥ 25 of them were evaluated as overweight and obese and formed the experimental group, if < 25 , it was considered normal and formed the control group. The study included female students aged 18 years and over, who do not have any chronic diseases and volunteered to participate in the study.

The data were collected by the researchers using a questionnaire method. The questionnaire form consists of two parts. In the first part, there were personal information questions.

The questions were aimed at determining the general characteristics, eating and exercise habits of the individual.

In the second part, there was the Health Belief Model Scale in Obesity (HBMSO) consisting of 32 questions. The scale developed by Dedeli and Fadiloğlu consists of 32 items and is a measurement tool with high validity and reliability for our society (8). Obese individuals' attitudes and beliefs towards weight loss can be evaluated with the five dimensions of the Health Belief Model. These dimensions are; the importance of health, perceived susceptibility, perceived severity, perceived benefits, perceived barriers.

A personal information form and HBMSO were applied to the students in the experimental and control groups to collect the pretest data. After the pretest data were collected, the students in the experimental

group were taken to a 6-week program with 2 hours of healthy nutrition and exercise education per week. During this period, no education was given to the students in the control group. HBMSO, which was applied to the students in the experimental group at the beginning of the study, was repeated at the end of the education and post-test data were collected.

In the content of healthy nutrition education; The importance of nutrition, food-health relations, reducing the consumption of ready-to-eat (fast-food) food, consuming meals regularly and not skipping meals, reducing the consumption of foods with high sugar-fat content, avoiding one-way nutrition, balanced consumption of all kinds requirement were emphasized. In exercise education; the benefits of regular exercise to health and weight control were emphasized and a training booklet was distributed by explaining the types of exercise they can do.

Statistical analysis of the research data was made with the SPSS v21.0 data analysis program, and the data were expressed as number, percentage and mean. Chi-square test was used to compare the general characteristics, diet and exercise status of the students in the experimental and control groups. The Mann-Whitney U test and the Wilcoxon Signed Ranks Test were used in the comparison of HBMSO sub-dimension scores of the students in the experimental and control groups within and between groups. In statistical analysis, the significance level was accepted as $p < 0.05$ at 95% confidence interval.

Approval was obtained from Firat University Non-Invasive Research Ethics Committee in order to conduct the research (11.07.2019/30/4). The aim and method of the research were explained to the students who constituted the research group, the voluntary consent form was read and their signatures were taken. It was stated that the identity of the participant and the information obtained during the research will be kept confidential.

After the education given to the students in the experimental group, a conference on nutrition and exercise was given to the students in the control group in line with the principle of equality.

Results

In this section, findings obtained from research data are presented. The distribution of the socio-demographic characteristics of the students in the experimental and control groups is given in Table 1. The mean age of the students in the experimental group was 23.56 ± 1.95 . 76.0% of the students in the experimental group stated that their family income was equal to expenses, mothers of 60.8% had an education level as literate and primary school graduate, fathers of 40.0% were a high school graduate, mothers of 80.0% were not working in any job, fathers of 68.0% had a job, 80% were living in nuclear families and 40.0% stated that the number of children in the family was between 3 and 4. The mean age of the students in the control

group was 23.76 ± 0.72 . 64.0% of the students in the control group stated that their family income was equal to expenses, mothers of 76.0% had an education level as literate and primary school graduate, fathers of 36.0% were a high school graduate, mothers of 96.0% were not working in any job, fathers of 48.0% had a job, 84.0% were living in nuclear families and 44.0% stated that the number of children in the family was between 3 and 4. It was determined that the students in the experimental and control groups showed similar distribution in terms of demographic characteristics and there was no statistically significant difference between the groups ($p > 0.05$).

Table 1: Distribution of the socio-demographic characteristics of the students in the experimental and control groups.

Socio-demographic characteristics	Experimental group (n=25)		Control group (n=25)		Test**
	n	%	n	%	
Age ($\bar{X} \pm SD^*$, years)	23.56 \pm 1.95		23.76 \pm 0.72		
Family monthly income					
Income > expense	2	8.0	4	16.0	$X^2=1.035$ $p=0.596$
Income = expense	19	76.0	16	64.0	
Income < expense	4	16.0	5	20.0	
Mother education level					
Literate-elementary	15	60.0	19	76.0	$X^2=8.433$ $p=0.077$
Secondary school	2	8.0	4	16.0	
High school	6	24.0	2	8.0	
University	2	8.0	0	0.0	
Father education level					
Literate-elementary	3	12.0	9	36.0	$X^2=6.022$ $P=0.198$
Secondary school	7	28.0	8	32.0	
High school	10	40.0	4	16.0	
University	5	20.0	4	16.0	
Mother's work status					
Employed	3	12.0	0	0.0	$X^2=3.697$ $p=0.157$
Unemployed	20	80.0	24	96.0	
Retired	2	8.0	1	4.0	
Father's work status					
Employed	17	68.0	12	48.0	$X^2=2.785$ $p=0.248$
Unemployed	4	16.0	4	16.0	
Retired	4	16.0	9	36.0	
Family type					
Nuclear family	20	80.0	21	84.0	$X^2=1.024$ $p=0.599$
Extended family	4	16.0	2	8.0	
Broken family	1	4.0	2	8.0	
Number of children in the family					
≤ 2 children	7	28.0	4	16.0	$X^2=1.088$ $p=0.580$
3-4 children	10	40.0	11	44.0	
5 and over	8	32.0	10	40.0	

*SD: Standard deviation , **Chi-square test was applied.

Table 2 shows the distribution of the nutrition and exercise habits of the students in the experimental and control groups. 52.0% of the students in the experimental group stated that they ate three main meals daily, 44.0% ate two snacks daily, 60.0% skipped some meals, 44.0% ate at normal pace, 60.0% indicated the amount of food they ate changed according to the psychological state and ate more, 76.0% did exercise to lose weight and 56.0% of them never did exercise. 56.0% of the students in the control group stated that they ate three main meals daily, 40.0% ate one snack daily,

44.0% skipped some meals, 56.0% ate at normal pace, 48.0% indicated the amount of food they ate changed according to the psychological state and ate less, 76.0% did not exercise to lose weight and 68.0% of them never did exercise. When the nutrition and exercise habits of the students in the experimental and control groups were compared, it was seen that the answer given to the question, do you exercise to lose weight, differed significantly according to the groups ($p < 0.001$), and the groups were homogeneous in terms of other characteristics ($p > 0.05$).

Table 2: Distribution of the socio-demographic characteristics of the students in the experimental and control groups.

Nutrition and exercise habits of the students	Experimental group (n=25)		Control group (n=25)		Test*
	n	%	n	%	
How many main meals do you have a day?					
1 main meal	0	0.0	2	8.0	$X^2=2.466$ $p=0.291$
2 main meals	12	48.0	9	36.0	
3 main meals	13	52.0	14	56.0	
How many snacks do you have a day?					
No snacks	4	16.0	6	24.0	$X^2=1.511$ $p=0.680$
1 snack	8	32.0	10	40.0	
2 snacks	11	44.0	7	28.0	
3 snacks	2	8.0	2	8.0	
Do you skip meals?					
Yes	15	60.0	4	16.0	$X^2=3.000$ $p=0.223$
No	1	4.0	10	40.0	
Sometimes	9	36.0	11	44.0	
How would you rate the way you eat?					
Fast	10	40.0	7	28.0	$X^2=0.889$ $p=0.641$
Slow	4	16.0	4	16.0	
Normal	11	44.0	14	56.0	
Does the amount of food you eat change depending on your psychological state?					
No	5	20.0	2	8.0	$X^2=4.783$ $p=0.091$
I eat less	5	20.0	12	48.0	
I eat more	15	60.0	11	44.0	
Do you exercise to lose weight?					
Yes	19	76.0	6	24.0	$X^2=13.520$ $p < 0.001$
No	6	24.0	19	76.0	
How often do you exercise?					
Never	14	56.0	17	68.0	$X^2=0.890$ $p=0.641$
1-2 times a week	9	36.0	6	24.0	
3 times a week and more	2	8.0	2	8.0	

*SD: Standard deviation , ** Chi-square test was applied.

Table 3 shows the comparison of the pretest and posttest HBMSO sub-dimension scores of the students in the experimental and control groups within and between the groups. While the scores of the experimental and control groups showed similar distribution in the sub-dimensions of health importance, perceived susceptibility, perceived severity and perceived barriers ($p>0.05$), the difference between the experimental and control groups in the perceived benefits dimension was

statistically significant ($p<0.001$). When the before and after education HBMSO sub-dimension scores of the experimental and control groups were compared, it was found that the difference in the importance of health, perceived susceptibility, perceived severity, perceived benefits, and perceived barriers dimensions of the experimental group was significant ($p<0.001$). HBMSO sub-dimension scores of the control group did not differ ($p>0.05$).

Table 3: Comparison of pretest and posttest HBMSO sub-dimension scores of students in the experimental and control groups within and between groups.

HBMSO Sub-dimensions	Experimental group	Control group (n=25)	Test**
	X±SD*	X±SD*	
Importance of health			
Pretest	2.50±0.42	2.67±0.54	U=259.000 P=0.297
Posttest	3.87±0.40	2.47±0.63	U=25.500 p<0.001
Test***	Z=-4.323 p<0.001	Z= -0.716 p=0.477	
Perceived susceptibility			
Pretest	1.86±0.57	2.33±0.73	U=211.000 p=0.057
Posttest	4.09±0.72	2.23±0.81	U=36.500 p<0.001
Test***	Z= -4.350 p<0.001	Z=-0.684 p=0.494	
Perceived severity			
Pretest	1.23±0.43	1.51±0.77	U=216.500 p=0.055
Posttest	4.64±0.81	1.74±0.96	U=34.500 p<0.001
Test***	Z=-4.422 p<0.001	Z=-0.991 p=0.322	
Perceived benefits			
Pretest	1.52±0.42	2.71±0.92	U=81.500 p<0.001
Posttest	4.34±0.65	2.50±1.15	U=74.500 p<0.001
Test***	Z=-4.375 p<0.001	Z=-0.729 p=0.466	
Perceived barriers			
Pretest	3.93±0.41	3.87±0.62	U=243.500 p=0.179
Posttest	4.20±0.35	3.62±0.62	U=120.500 p<0.001
Test***	Z= -3.873 p<0.001	Z=-1.804 p=0.071	

*SD: Standard deviation , ** Mann Whitney U Test was applied, *** Wilcoxon Signed Ranks Test was applied

Discussion

In this section, the findings obtained from the research conducted to determine the effect of education given to university students on women's beliefs about obesity were discussed with the literature and similar research results.

There was no significant difference between the students in the experimental and control groups in terms of age, monthly income of the family, education status of

mother and father, working status of the mother and father, family type and the number of children in the family. When the nutrition and exercise habits of the students in the experimental and control groups were examined, it was determined that they were similar in all variables except the habit of exercising to lose weight.

Education given to obese individuals according to the health belief model is an

effective model to positively change individuals' beliefs about obesity and provide obesity management (12). When the before and after education HBMSO sub-dimension scores of the experimental and control groups were compared, it was found that the difference in the importance of health, perceived susceptibility, perceived severity, perceived benefits and perceived barriers dimensions of the experimental group was significant. The results of this study reveal the effectiveness of six-week nutrition and exercise education and show that education can significantly improve health belief model parameters. Similarly, in previous studies conducted with different populations, knowledge scores in the intervention group increased compared to the control group (13-22).

Health Belief Model is one of the intrapersonal health education models (derived from behavior science theory) which are administered for nutrition education in various subjects (22). The Health Belief Model argues that individuals' health behaviors will be affected by their beliefs, values and attitudes. If these beliefs and attitudes that are regarded as problems are determined, the health education to be given or the treatment methods to be applied will be determined more suitable for that person (23). Importance of health from HBMSO sub-dimensions; it expresses the importance of health according to the individual and the individual's attitudes and beliefs required to be healthy and remain healthy in general. In our study, although the pretest scores of the experimental and control groups were at a medium level, there was a significant increase in the scores of the students in the experimental group after the education and the difference was significant. This result shows that the education given positively affects the students' attitudes and beliefs necessary for being healthy. There was no change in the scores of the control group. Similar results were obtained in the studies conducted and it was found that education has a positive effect on nutritional behavior (24, 25).

The Health Belief Model (HBM) is one of the most widely-used frameworks

developed to understand health behaviour. The HBM is recommended for nutrition education to increase the impact of educational programmes (26). The perceived sensitivity sub-dimension of HBMSO expresses a person's beliefs about the probability of contracting a disease or condition. The more a person feels at risk, the more he / she will reduce the risk-posing behavior (7, 9). It can be said that their perceived susceptibility towards obesity was low according to the pretest scores of the students in the experimental and control groups. After the education, the scores of the students in the experimental group increased significantly. In a study conducted in Iran, students' perceived susceptibility scores improved after nutrition education (26).

The perceived severity sub-dimension of HBMSO is how the severity or violence occurring in the individual is perceived against the consequences of the disease. This perception is particularly influenced by a person's health knowledge. If the person is informed about the general extent of the disease, his perception is affected accordingly (27). The pretest scores of the students in the experimental and control groups showed that their perceived severity towards obesity were low. However, after the education, the perceived severity of the experimental group were also positively affected and their scores increased. A study conducted in Southern Ethiopia supports our research finding and emphasized that the perceived severity has an important effect on improving nutritional knowledge (28).

The perceived benefits sub-dimension of HBMSO is the individual believing in the self-benefit of protective behavior suggested to protect from the disease or to reduce the severity of the disease (27). If the individual takes action on the issues he / she is sensitive to, he / she perceives the positive results as benefits (7). In our study, the perceived benefit pretest scores of the experimental and control groups differed significantly. Accordingly, the pretest scores of the experimental group before the education were low, while the scores of the control group were medium.

However, the perceived benefits of the experimental group was positively affected after the education and their scores increased significantly. In a study conducted with medical students, the benefit perception scores of the students increased significantly after the nutrition education given based on HBM (29).

Perceived barriers, which is the last dimension of HBMSO, is individually perceived barriers in exhibiting new behavior and adapting to this situation (27). The potential negative aspects of a particular health action perceived may act as impediments to undertaking recommended behaviors. A kind of nonconscious, cost-benefit analysis occurs wherein individuals weigh the action's expected benefits with perceived barriers "It could help me, but it may be expensive, have negative side effects, be unpleasant, inconvenient, or time consuming". Champion and Skinner reported that perceived barriers were determined to be the most important factor in

displaying behaviors as a result of many studies (7). It is seen that perceived barriers towards obesity were at a positive level according to the pretest scores of the students in the experimental and control groups. However, there was a significant increase in the scores of the experimental group after the education. There was no change in the scores of the control group. Our research finding is in line with previous research results (26, 29-31).

Like other studies, this study had some limitations. First, the limitations of the sample-size and limiting the study population to female students of university should be considered. We suggest future surveys with larger sample-sizes, diverse participants, and longer intervention periods to allow the results to be extrapolated to a larger population. Secondly, impact of the nutrition an exercises education was evaluated in a short period after completion of intervention and maintenance of behavior change needs longer follow up.

Conclusions

In conclusion, following the nutrition and exercise education given to obese students in this study, a positive change was achieved in the beliefs of students about obesity, and there was a significant improvement in the importance of health, perceived susceptibility, perceived severity, perceived benefits and perceived barriers scores. Studies on this subject in Turkey is quite limited. For this reason, our study makes important contributions to the literature.

Other studies evaluating attitudes

and beliefs towards obesity can be conducted to determine what obese individuals see as obstacles to themselves, what they see as benefits and what they think about obesity. In this way, more effective steps can be taken by creating realistic policies in the fight against obesity. In addition, it may be suggested to establish education programs for the prevention of obesity and health problems that may develop due to obesity, and to provide health belief model-based consultancy services to people who are obese and at risk of obesity.

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