

# Six Months Results of Obesity Management in Primary Care

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Original Research / Orijinal Araştırma

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## ABSTRACT

**Aim:** The purpose of this study was to give obese patients diet and exercise program and behavior modification who had admitted to the outpatient clinic in primary care, to lose 5-10% of their weight within 6 months.

**Methods:** This study was performed at March 2017- March 2018 in Erciyes University Family Medicine Department with the approval of the ethics committee and with the support of the Scientific Research Projects (ERUBAP, Project No. TTU-2016-7091). Patients with body mass index 30-40 kg/m<sup>2</sup> between the ages of 18-65 who applied to the family medicine polyclinic were included in the study. Diets were initiated according to baseline metabolic rates, exercise and fluid consumption recommendations were made, and behavior modification were told.

**Results:** In the observation group 2 people (10%) had lost more than 10% of their weight; 10 people (50%) had lost 5-10%, and the remaining 40% had lost 1-5% of their weight. On average, 5.2 (92.3±2.63 to 87.1±2.44) kg were lost at 3 months, while this was 4.3 kg (88.00±2.62) at 6 months. The weight loss of the patients in the first 3 months was above expectations. Afterwards, however, the patients had a slight weight regain due to difficulties in diet compliance and not having enough time for exercise, but they did not return to their starting weight at the end of the study.

**Conclusion:** It has been observed that obesity care could be done in primary care and family physicians should be encouraged to do so.

**Keywords:** primary care, obesity, weight-loss, follow-up studies

## Birinci Basamakta Altı Aylık Obezite Yönetimi Sonuçları

### ÖZ

**Amaç:** Bu çalışmanın amacı, birinci basamak polikliniğine diyet ve egzersiz nedeniyle başvuran obez hastaların diyet, egzersiz ve davranış değişikliği ile ve 6 ay içinde kilolarının % 5-10'unu kaybetmesini sağlamaktır.

**Yöntem:** Bu çalışma, Mart 2017- Mart 2018 tarihlerinde Erciyes Üniversitesi Aile Hekimliği Anabilim Dalı'nda etik kurul onayı ile ve Bilimsel Araştırma Projelerinin desteğiyle (ERUBAP, Proje No. TTU-2016-7091) yapıldı. Çalışmaya Aile Hekimliği polikliniğine başvuran 18-65 yaş arası, beden kitle indeksi 30-40 kg / m<sup>2</sup> olan hastalar alındı. Bazal metabolizma oranlarına göre diyetler başlatıldı, egzersiz ve sıvı tüketimi önerileri yapıldı ve davranış değişikliği anlatıldı.

**Bulgular:** Gözlem grubunda 2 kişi (%10) ağırlıklarının %10'undan fazlasını kaybetti; 10 kişi (% 50) % 5-10, geri kalan %40'ı ise ağırlığının % 1-5'ini kaybetti. Ortalama 3 ayda 5,2 (92,3±2,63 ila 87,1±2,44) kg, 6 ayda ise 4,3 kg (88,00±2,62) kg olarak kaybedilmiştir. Hastaların ilk 3 aydaki kilo kaybı beklentilerin üzerinde idi. Daha sonra, ancak, diyet uyumu güçlüğü egzersiz için yeterli zamanı olmaması nedeniyle hafif bir kilo alımı mevcuttu, ancak çalışma sonunda başlangıç kilolarına geri dönmediler.

**Sonuç:** Birinci basamakta obezite bakımının yapılabilir olduğu görülmüştür ve aile hekimleri buna teşvik edilmelidir.

**Anahtar kelimeler:** birinci basamak, obezite, kilo kaybı, takip çalışmaları

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## Introduction

Obesity means an increase in the amount of fat in the body. The factors causing this are; socioeconomic, genetic, environmental, physical, behavioral and underlying diseases. When we look at the past, we see that overweight and obesity are accepted as a symbol of health and wealth in societies. Considering that people have been struggling with hunger, famine and poverty throughout history, such a perception is normal for the conditions of that time. Although hunger and lack existed in some communities today, health problems due to nutritional deficiency and infectious diseases have been replaced by health problems caused by over-nutrition and obesity in many places (1).

Excess body weight (overweight, obesity) is one of the most serious public health problems of the 21st century, according to World Health Organization (WHO) data. According to the data collected earlier, there are great differences in the prevalence of overweight and obesity among the socioeconomic groups in the countries of the region and these countries. Obesity was initially accepted as a problem of developed countries. Obesity has been inevitable with the increase in income levels in developing countries, the adoption of the western lifestyle, the opening of fast food restaurants, the increase of food marketing, the decrease in energy consumption while increasing energy intake and finally the migration from rural to urban. This variation demonstrates the importance of environmental and sociocultural determinants of diet and physical activity. The overwhelming majority of the total disease burden in the WHO European Region is due to being overweight: more than 1 million deaths per year and 12 million years of life-long disease (1,2).

The epidemic of obesity threatens global health on a large scale. Since 1975, the rates of obesity have risen in every country in the rich countries such as the United States and Saudi Arabia or in poor countries such as Somalia and Angola. Today, the risk of becoming obese is three times higher than it was in 1975. A study published in *The Lancet* in 2016 compiled data on global obesity and used the results of

1,698 studies examining 19.2 million people in 200 countries. The increase in obesity from 1975 to 2014, showed that the probability of achieving the global obesity goal was almost zero (3). The authors write in their comments: 'If these post-2000 trends continue, by 2025, the prevalence of global obesity will reach 18% in men and will exceed 21% in women; severe obesity will be 6% in men and 9% in women'.

North Korea's obesity prevalence rose from 1.6% in 1975 to 2.8% today. In Japan there was 2% increase (from 1.1% to 3.3%) since 1975. The biggest changes occurred in smaller Pacific island countries. Samoa, Tonga, and Tuvalu have more than 20% increase in obesity rates. Perhaps most important country is China. In 1975, only 0.5% of Chinese adults were obese. Today, China's obesity has grown by 8% (16 times) (3). This is alarming when health complications associated with obesity are considered. Obesity leads to many serious health problems such as cardiovascular disease, diabetes, cancers and musculoskeletal disorders. This is a financial burden for governments and individuals, while in other respects it is not very satisfactory (3).

Childhood obesity is an important indicator of adult obesity. Metabolic and cardiovascular risk profiles progress from childhood to adult life, leading to a high risk of health and premature death. In addition, adults who were obese adolescents are more likely to have lower incomes and higher social exclusion (3). More than 60% of children who are overweight before adolescence will gain excess weight during adulthood and this causes a significant increase in the burden of health services and the average age at which noncommunicable diseases occur (4).

Various policies have been developed for the prevention of obesity, but how much of these practices are being implemented or the extent to which they are able to put their practices to life is debatable. Family physicians working at this stage have a great role in the detection and prevention of obesity since they are the first-line doctors who are doing screening tests, and following the individuals with the growth curves in every year of life. Therefore, body mass index (BMI) of each patient who applied to the primary care should

be calculated and the BMI calculation should not be omitted since precautions may be taken without progressing to obesity when caught in overweight range (BMI > 25). Family physicians should not be afraid of starting diet and exercise therapy for obese patients and should provide pharmacological treatment if necessary.

The purpose of this study was to give obese patients who had admitted to the outpatient clinic in primary care diet and exercise program and behavior modification to lose 5-10% of their weight within 6 months.

### Methods

Patients were selected from individuals who applied to the Family Medicine outpatient clinic. Obese patients were followed once per month for 6 months. Our study was planned in accordance with the decisions of Helsinki Declaration and patient rights regulation and the study was carried out in Erciyes University Medical Faculty hospitals. Ethical committee approval was obtained from the ethics committee of Erciyes University Faculty of Medicine Clinical Research Ethics Committee (Date: 18.11.2016, Decision Number: 2016/594, Approval Number: 96681246/). Written informed consents were obtained from the patients.

Blood pressure and nutrition information system was purchased by the support of Scientific Research Projects of Erciyes University (ERUBAP, Project No. TTU-2016-7091). A total of 60 obese and 18-65 years old individuals (body mass index 30-40) were planned to be included in the study. Individuals aged <18 years and >65 years, pregnant women, nursing women and people with BMI > 40, patients with mental retardation and cancer patients were not included in the study.

### Procedure

The patients were included in the study by the family physicians, physical examinations were made, weight, height, body mass index, blood pressure and heart rate were measured before the commence and at the end of the study. The study period was determined to be a total of 24 weeks.

The volunteers were given diet training and the patients were divided into two groups. It was decided

that the study group would record what they eat and drink every day and daily exercise amount. Patients in the study group were invited for control once a month. Patients were asked to exercise every day.

Blood tests were taken and the patients were informed about how they should start a diet and how to start exercising before the study. Blood tests included complete blood count, blood lipids, thyroid, liver and kidney function tests. The amount of diet calories to be applied to each patient was calculated by considering their age, height and additional diseases and by determining their optimal weight. The study was basically a calorie restriction. The exercise was recommended as walking at a moderate pace starting from 20-30 minutes. Every week, the duration of the walk can be increased by 5 minutes and can be increased up to an hour. The calories of the patients were calculated from their daily record of consumed food and drinks.

### *Tanita measurements (Measuring weight)*

The mechanism of work of tanita is bio impedance analysis. The 50 kHz electrical current is sent to 5 separate body zones. Depending on the permeability rate of the tissues, the fat Rate, lean mass and muscle weight of the arms, legs and body are analyzed in this way. The device is also a weigher with 200 kg capacity and 100 g sensitivity. Depending on the body structure of individuals, fat ratios change. When we look at the measurement values of individuals who are visually highly structured or overweight, it can be observed that muscle ratios are high and fat rates are low, and on the contrary, when a person with weak weight is measured, muscle mass may be low but the fat ratio may be high and this can be a high risk for health. The measurements of the patients in the study group were performed monthly with the Tanita BC 418 Body Analyzer. The patients were told to come with the same clothes each time and the patients and the measurement was decreased 1 kg if they were hungry and 1.5 kg if they were full.

After entering the patient's height, age, sex and body structure, the patient was told to put the feet bare on the device after the sign. The patient was given pedals in both hands with metal parts was contact with

the skin. Weight of patient, BMI, fat percentage and fat mass, muscle mass and amount of water were measured. In addition, fat mass and muscle mass accumulation in extremities and abdominal region were calculated. Tanita measurements of the patients were done once in four weeks.

#### ***Blood pressure measurements***

The physician asked the patients if they had smoked, tea, coffee or cigarettes in the last 30 minutes, and if they did not, the blood pressure was measured in the sitting position after 10 minutes of rest. Microlife Afib BP 200 blood pressure monitor was used in the measurement. Blood pressure measurements of the patients were done once in four weeks.

#### ***Diet***

The results of the blood tests of the patients were checked and according to the data obtained a diet of 1200 to 1500 kcal / day for women and 1500 to 1800 kcal for men were determined considering the basal metabolic rates. Three main and three snacks were planned. Fats, carbohydrates and proteins were balanced. Diet programs were created in cooperation with the dietitians. The list showing the food which patients can replace on the diet were given. The patients were planned to lose 5-10% of the basal weight in 6 months.

#### ***Workout programme***

Patients were told that the combination of exercise and diet was the key point and they should increase the mobility in their lives as much as possible. The exercise was recommended to walk in the mid-day for 20-30 minutes, or at least 5 days a week for 30-45 minutes. The moderate intensity of exercise was described as approximately 100 steps per minute. It was asked to keep the heart rate between 50% and 85% of the maximum heart rate (220-age), or speech test could be done. They were told to be able to can say one or two sentences or a song aloud, which means a medium intensity exercise. If a person was having difficulty completing a sentence, he or she was considered exercising at high intensity.

#### ***BEBIS Programme***

Nutrition Information System 7.2 was installed on

the computer. In this program, files are created for the patients, what they eat is followed up, calorie calculations are made according to these diets are regulated. It is even possible to enter the weight to the system. The values of all the nutrients in the data banks are 100 gr. The main nutrient database used in the BEBIS program includes nutrient values from various data sources. These are:

- German Bundeslebensmittelschlüssel-A database containing over 13000 nutrients and over 134 nutrients,
- USDA-sr (American Nutrient Database for Standard Reference),
- Data set by various Turkish sources.

BEBIS programme evaluation of the patients were done once in four weeks.

#### ***Behavioral Change Recommendations***

After the patients who were in the study group were instructed on how to adjust their diet lists, the following recommendations, which were determined by the Turkish Endocrinology and Metabolism Association, were explained to each patient (5).

##### ***Suggestions for Shopping***

- Go on a full stomach when shopping;
- After making a list,
- With enough money for the list,
- Not to buy ready-to-eat foods,
- Selecting the low energy from the foods in the same group,
- Change channel when you encounter television programs or advertisements related to food,

##### ***Recommendations for making plans***

- To plan in advance what to eat to limit food consumption,
- Try to exercise instead of snacks in leisure time and choose a specific area for exercise at home or work,
- In the morning, drink 1 glass of warm water before, during and after each meal.
- Meals (5-6 meals a day) of the recommended food at scheduled times.
- Not to skip meals
- Not accepting refreshments and explaining why you did not accept,

- Explain that it would be better for people in the neighborhood to encourage you not to eat, rather than insist on eating,

- Regular habit of toilet (every day, in the morning)

- Every week, in the morning on an empty stomach, to be weighed in the same clothes and to record the weight.

#### ***Suggestions for food-related activities***

- Keep food away from eyesight,
- Do not spend too much time in the kitchen;
- Try not to keep food and foods that should not be eaten at home,
- Make sure the kitchen scoop is small at dinner,
- Do not place the food pot or container on the table,
- Get out of the table when you finish your meal,
- Do not hesitate to leave food on the plate, you will finish the meal at the snacks,
- Try to chew each bite as much and as good as possible,
- Leave the fork or spoon on the table between the bites,
- Do not do other activities while watching TV, reading, etc.
- Try not to eat after dinner,
- If you feel that you are not full, put as little food as possible on the plate and wait a while after eating a little and feel the feeling of fullness,
- Identify events and situations that push you to eat, and try to stay away from them,

#### ***Suggestions for Special Days***

- Choose calorie-free or lower-calorie drinks,
- Make sure that you choose the foods that are suitable for your diet list in all conditions,
- When you are very hungry, eat low energy foods (such as salad, fruit, buttermilk, soup).
- Prepare yourself to refuse food offerings and don't be discouraged by mishaps. If you eat too much, try to pass the next meal with salad and some cheese.

#### ***Other Suggestions***

- Increase the activity as much as possible. Do not drive on short distances, take one or two stops before

getting off the bus, do not use the elevator, try fast pace, do household chores by yourself.

- Always keep your sneakers in front of the door,
- Make sure to spend time with active people,
- Try to encourage people around you to adequate and balanced nutrition,
- When you are cooking, the first choice should be to cook low-energy meals (do not put fats in meat dishes, reduce the amount of fat you normally use, prefer grilling or baking instead of frying)
- Compare the advantages and disadvantages of applying a diet program,
- Gluttony and eating while hungry is not the same thing, notice it,
- Trust yourself in weight reduction, be patient, try to do other activities instead of eating for decreasing stress (like spending time reading books).

#### ***Statistical Analysis***

The data were evaluated in IBM SPSS Statistics 22.0 statistical package program. Frequency was calculated by Chi-Square test. The normality analysis of quantitative data was done by Kolmogorov-Smirnov normality analysis test. They were divided into parametric and non-parametric values. After the results, parametric values were evaluated with T-test and non-parametric values were evaluated with Mann-Whitney U Test. The data obtained from the T-test were written as mean  $\pm$  standard deviation. Median values of Mann-Whitney U Test results were obtained. The pre- and post-quantitative data were analyzed using Paired T-test (Wilcoxon Ranks test was used for non-normal distribution). The distribution of qualitative data was defined as percentage. Since 6 controls were performed in total, whether or not they had a difference was assessed with the Mauchy's Test. Unit number (n), mean, standard deviation values were given.  $p < 0.05$  was considered statistically significant.

#### **Results**

It was decided to recruit 30 patients for the study group and 30 patients for the control group. 36 patients were recruited for the study group and 31 patients for the control group. One patient stated that he was afraid of giving blood sample and was excluded from the study. Six patients stated that it was very difficult for

them to reduce eating and did not complete the study. Sixteen patients were excluded from the analysis and 20 patients were analyzed. In the control group; 3 patients could not be reached, 1 patient was excluded from the study because of pregnancy, 2 patients could not come for control and 2 patients were out of the city,

and in total 8 patients were excluded from the study, 23 patients were included in the analysis.

Our study was performed between March 2017 and March 2018. Thirty four (79.1%) of the participants were female and 9 (20.9%) were male (Table 1).

**Table 1.** Demographic variables according to groups

Variables (%)		Groups		p value
		Study	Control	
Gender	Women	41.9 (n=18)	37.2 (n=16)	0.14
	Men	4.7 (n=2)	16.3 (n=7)	
Education	Primary school	32.6 (n=14)	30.2 (n=13)	0.74
	High school	4.7 (n=2)	7 (n=3)	
	University	9.3 (n=4)	16.3 (n=7)	
Marital status	Married	39.5 (n=17)	51.2 (n=22)	0.25
	Single	7 (n=3)	2.3 (n=1)	
District	Talas	16.3 (n=7)	30.2 (n=13)	0.38
	Melikgazi	14 (n=6)	9.3 (n=4)	
	Kocasinan	16.3 (n=7)	14 (n=6)	
Smoking	No	32.6 (n=14)	34.9 (n=15)	0.37
	A few	9.3 (n=4)	4.7 (n=2)	
	20 cigarettes	4.7 (n=2)	14 (n=6)	
Operation	No	20.9 (n=9)	14 (n=6)	0.16
	Yes	25.6 (n=11)	39.5 (n=17)	
Medicine use	No	23.3 (n=10)	23.3 (n=10)	0.45
	Yes	23.3 (n=10)	30.2 (n=13)	

The mean age of the groups was 42.79±9.47 and the minimum value was 28 and the maximum value was 65. The marital status of 39 (90.7%) patients were married and 4 (9.3%) were single. Twenty seven patients (62.8%) were primary school graduates, 5 (11.6%) were high school graduates, 11 (25.6%) were university graduates. The number of non-smokers was 29 (67.4%), a few cigarette smokers per day was 6 (14%), and 8 (18.6%) people smoked a pack of cigarettes (20 cigarettes) per day. The number of patients who underwent surgery was 28 (65.1%) and 15 (34.9%) had no surgical operation. The number of medicine users was 23 (53.5%) and the ones who did not use any medicine were 20 (46.5%). All of the patients were not drinking alcohol. Twenty four (55.8%) of the patients were housewives; 7 secretaries and hospital staff (16.3%); 2 technicians and workers (4.7%); and 1 person (2.3%) was an engineer. The average water consumption in the study group were

2.06±0.60 litres per day and the average monthly exercise were 29.85±16.21 minutes per day (Table 2).

**Table 2.** Monthly average consumption of water (liters) in exercise group and exercise time (minutes)

	Study group
Water consumption	2.06±0.60
Minimum value	0.84
Maximum value	3.65
Exercise	29.8±16.21
Minimum value	0
Maximum value	74.5

### **Weight loss**

According to the data obtained from the study, when the observation group was compared to the control group; the combination of behavioral change, diet and exercise resulted decrease in the body weight of obese patients, BMI and fat percentages. No significant results were obtained in the muscle mass

and body water which changed at every control. It was found that the patients had difficulty starting the diet after their usual eating habits, but got used to it later. It was observed that the individuals who work in particular were mostly skipping snacks and sometimes they did not diet because of the meals in the workplace and they were getting more calories.

Those who were housewives were below exercise targets. The patients lost weight in the target range within the first 3 months but then the exercise rates decreased. Since the calorie intake of housewives during friend visits were too high, they exceeded the target calorie intake. As energy intake-consumption imbalance occurred in favor of energy intake, weight regain was observed. It was observed that gender, age range, occupation, district, smoking and operation status had no effect on the weight loss of the patients ( $p > 0.05$ ).

Operated patients were divided into groups; abdominal surgery, pilonidal sinus-hemorrhoid operation, ear-nose-throat and joint surgery. Abdominal surgery rate in the whole sample was 70.5%; joint surgery 11.7%; pilonidal sinus and hemorrhoids were 11.7% and ear-nose-throat 5.8%. Abdominal surgery included appendectomy, cholecystectomy and cesarean section. Abdominal surgery may have affected weight loss. The mean water consumption was 2.06 liters and the average monthly exercise rate was 29.8 minutes (Table 2). The water consumption was divided into two groups with less than 2 liters and above 2 liters, while the mean exercises were divided into two groups: 30 minutes and more than 30 minutes. However, since our sample group was low, the effects of exercise and water consumption on the attenuation of those with abdominal surgery history were not statistically significant. The percentages of chronic diseases are shown in Table 3 and the chronic disease kinds are given in Table 4.

**Table 3.** Chronic diseases

Chronic disease	Study group	Control group
Yes	13.9 (n=6)	16.2 (n=7)
No	32.5 (n=14)	37.2 (n=16)

**Table 4.** Percentage of chronic diseases

Variables	Study group	Control group
Hypertension	4.6 (n=2)	2.3 (n=1)
Hypothyroidism	2.3 (n=1)	9.3 (n=4)
Impaired Fasting Glucose	4.6 (n=2)	2.3 (n=1)

#### *Evaluation of laboratory tests*

Parametrical and non-parametric values were determined with Kolmogorov-Smirnov test. Parametric values; total cholesterol, HDL, LDL, BUN, Hb, Hct and T-test were performed to determine whether there was a difference between the groups after 6 months of follow-up. Mean and standard deviation values were calculated from the T-test and p-values were determined from the Independent Sample Test. When we compared these values between the observation and control groups according to the p values, we observed a 6-month control and a slight increase in the hematocrit value in the observation group at the end of the follow-up period ( $40.62 \pm 5.04$  and after 6 months  $41.73 \pm 4.06$ ,  $p < 0.05$ ). However, no significant difference was observed for other tests ( $p > 0.05$ ). Although LDL value was decreased, it was not significantly different. When the groups were evaluated internally, there was a decrease in the LDL value in both groups (from  $110.30 \pm 38.59$  to  $108.6 \pm 33.41$  in the study group and  $115.06 \pm 42.78$  to  $113.11 \pm 40.17$  in the control group). Study and control groups were compared. For 6 months, those in the control group did not diet or exercise; the people in the control group had an irregular diet and did not exercise every day. In the study group, it was desired to observe a difference in the laboratory values after diet and exercise. The comparison between the first and last values of HDL ratios in the study group showed a significant increase in the final value;  $44.45 \pm 11.44$  to  $49.50 \pm 11.39$  after 6 months ( $p < 0.05$ ). No significant difference was observed in the other values (triglyceride, creatinine, AST, ALT, TSH) ( $p > 0.05$ ). There was statistically significant difference between the two groups in the ALT levels at the end of the study ( $p = 0.009$ ,  $p < 0.05$ ). There was also a difference between the first and last ALT levels in the study group (a reduction of 5 units). Diet and exercise

caused a decrease in the liver function tests AST and ALT.

The systolic blood pressure, body weight, BMI, mass and percentage of muscle and were found to be significantly different between the baseline and the end values in favor of the decrease in the follow-up (p values of 0.005, <0.001, <0.001, <0.001, respectively). When variables were compared according to their next values; there was a significant change in systolic blood pressure only between follow-ups 1 and 2 (p = 0.021). When the body weight was examined, the first control showed a significant decrease compared to the others (p = 0.001). No significant difference was observed in diastolic blood pressure and pulse rate. Also, no significant results were found in the third control compared to the others. For BMI, a significant decrease was observed in the first 3 controls (p = 0.008). There was no significant difference between the groups after the third control.

In the percentage of fat; there was no significant decrease between the first and second control, but the decrease was observed to be significant after 5 controls (p < 0.05). In the evaluation made for fat mass; the decrease up to the 5th control was found to be significant (p = 0.002). In the study group, it was evaluated that 5-10% of the body weight was lost in the third month. Two people (10%) lost more than 10% of their weight; 10 people (50%) had a loss of 5-10% and the remaining 40% had lost 1 to 5% of their weight. However, there was an increase in weight from these values at the end of the study. On average, 5.2 (92.3±2.63 kg to 87.1±2.44 kg) of weight loss was lost in the third month and this was 4.3 kg (88.00±2.62) in the sixth month (Figure 1). BMI values decreased from 34.81±0.70 to 32.86±0.61 at third month, and there was 1.95 unit increase from this value at the end of 6 months (33.19±0.64).

While there was a decrease in weight, fat mass and BMIs in the study group, there was a slight increase in the control group for 6 months. In the control group, the mean weight gain was 0.66 kilograms in 6 months. The mean value increased from 93.20 to 93.86 kg.

## Discussion

According to our data 10% of the patients in the

observation group had lost more than 10% of their weight; 50% had a loss of 5-10% and the remaining 40% had lost 1-5% of its weight. However, there was a slight increase at 6. month. On average, 5.2 kg (92.3±2.63 to 87.1±2.44 kg) of weight loss was seen in the third month and this was 4.3 kg (88.00±2.62) in the sixth month. BMI values were decreased 1.95 unit at 3. months (34.81±0.70 to 32.86±0.61) and at 6 months to 33.19±0.64 (1.62 unit reduction). The demographic data of the participants were 79.1% female and 20.9% male. It was observed that when obese patients were encouraged and followed in primary care, they were able to lose weight and 60% lost a weight ratio of 5% and over. Therefore, family physicians should take responsibility without hesitation and obese patient follow-up and treatment.

In 2011, Kate Jolly et al. (6) in Birmingham, UK conducted a randomized controlled trial of 740 obese men and women to determine the confidence in the first step in weight loss. Six different weight loss programs were created, each 12 weeks: Weight Watchers; Slimming World, Rosemary Conley; with 3 groups and dietetic led program; first-line, one-to-one counseling; 3 groups of pharmacy service. The patients could choose any of the six programs. Twelve coupons which provided free entry to a local entertainment (fitness) center were provided. The results were followed by 658 (88.9%) participants and 522 people in one year (70.5%). All programs, until the end of the program from the beginning (1.37 kg (primary)) - 4.43 kg (Weight Receiver)) serious weight loss, and primary care and pharmacy service, within a year caused serious weight loss. Within one year, the Weight Watchers group had more weight loss than the control group (mean 2.5 (95% confidence interval 0.8 to 4.2 kg more). At the end of the program, commercial programs provided more weight loss than primary care programs (mean difference 2.3 (1.3 to 3.4) kg). First-line follow-up is not preferred in Birmingham because it is expensive to provide primary care programs and more weight loss was provided by commercially available facilities (6). In our study, we proved that obese patient follow-up could be performed in the primary care. Studies also suggest that many

physicians believe they lack knowledge and training in the treatment of obesity. In one study, a quarter of physicians considered that they had no or only mild competence, while 20% felt that they did not feel comfortable at all, or that they felt only mildly comfortable (7). One study from Israel concluded that most physicians (72%) thought they were not well prepared to deal with obese patients; 60% of physicians think that they do not have enough knowledge about the subject (8). We have proven that family physicians can follow and treat in primary care. Therefore, family physicians in family health centers should be trained and encouraged in this respect.

In a randomized controlled study conducted by Rachel D. Barnes et al. (9) in 2014, obese patients were followed up with motivational interviews, general care and nutritional psycho-education using internet resource support in primary care. The patients were evaluated independently after 3 months follow-up. Weight, triglyceride levels and depression scores were significantly decreased in subjects with nutrition psycho-education and in those with motivational interviews. The weight loss results were preserved at 3-month follow-up, 25% motivational interview and a nutrition psychoeducation patient achieved at least 5% weight loss. Family physicians can help obese patients to change their lives, exercise and diet by making motivational interviews with them.

In 2010, the Louisiana Obese Associations Study (LOSS) was conducted to investigate whether individuals with BMI 40-60 lost weight actively in primary care. Volunteers (597) were screened and randomized as intensive medical intervention (n = 200) or general care condition (n = 190). The general care group had training in the internet weight management program. Medical intervention group recommendations included 900 kcal of liquid diet, group behavioral counseling, structured diet, and selection of pharmacotherapy (sibutramine hydrochloride, orlistat or diethylpropion hydrochloride) for 3 to 7 months and continued use of medicines and care for 12 weeks or less. Among 390 randomized participants, 31% achieved 5% or more weight loss in the medical group, and 7% achieved a

weight loss of 20% or more, while in the general care group these rates were 9% and 1%, respectively (10).

In a 2002 study; It shows that approximately 69% of the European Union is at the lower end of the physical activity scale and therefore inactive. The most active countries were Netherlands and Germany; and Sweden was the least active (11). In our study, it was observed that individuals had difficulty in taking the time to exercise and they could not make it regular when they started. It was observed that the employees were walking at work and the housewives were satisfied with the work of the house. Public awareness can be made on these issues. Numerous cross-sectional studies in various population groups show that there is an inverse (and expected) relationship between conventional physical activity and obesity indicators. People who are overweight or obese have lower levels of cardiorespiratory fitness than those with normal weight.

Quantitatively, as mentioned in a six-year follow-up of the women from the Nurse Health Circle, one hour of rapid walking per day was associated with a 25% reduction in the risk of obesity (BMI above 30kg/m<sup>2</sup>), and a two-hour additional television follow-up of six years was shown to be associated with an increased risk of obese 25% during follow-up (12). Patients eat more food in front of the television and consumes a large amount of snacks. This is why TV watching rates should be reduced.

Considering daily life activities, a five-year follow-up study in males showed an inverse relationship between walking or cycling and weight gain (13). Information from prospective cohort studies on specific dietary determinants of obesity is limited.

In 2015, the frequency of obesity was compared with 94 patients in Erciyes University Family Medicine Department. Three study groups and one control group were formed by Family Physicians for 4 months. The study groups were weekly follow-up, two-week follow-up and monthly follow-up groups. The foods were recorded in a diary in the study groups and calorie follow-ups were performed with BEBIS. There was a statistically significant decrease in body mass indexes in study groups. The study was

successful in losing weight, but the ideal weight loss rate was not reached within 12 weeks. Although there was no statistically significant difference in body mass indexes in weekly, 15-day and monthly groups, the highest decrease was found in the weekly group (14).

#### **Strengths of the study**

In the literature, our study is one of the few researches that shed light on this problem, since there is little work done in the field of medicine in our country. One-to-one interviews with patients, seeing what the patients eat and giving suggestions on diet, determining the compliance with the diet by using the BeBis program for calorie measurements were the strengths of this study. Behavioral changes were told to the patients.

#### **Limitations of the study**

The follow-up period of 6 months may be insufficient for obtaining maximum benefit.

The effects of the amount of water consumed and the duration of exercise on the attenuation of the patients were wanted to be determined but the analysis could not be calculated as it would be meaningless due

to the small number of samples. Tanita measurements are very sensitive and the values vary depending on many conditions; it may be affected by a non-compliance with one of the requirements for measurement. Patients may have written less than what they have actually eaten.

#### **Conclusion**

Patients did not know much about the health consequences of being obese. It should be specifically explained that obesity is the underlying cause of many diseases such as diabetes mellitus, hypertension and cardiovascular diseases. In order to prevent the increase in obese individuals, public education and awareness should be provided first. Family physicians may be trained for obese patients' treatment and follow-up. After this training, family physicians may perform obese patients' diagnosis, follow-up and treatment in primary care institutions. Obese individuals may have directed to family physicians in order to lose weight. BEBIS programme and Tanita device may be used in obesity treatment in primary care.

#### **References**

1. James WPT, Jackson-Leach R, Ni Mhurchu CI, Kalamara E, Shayeghi M, Rigby NJ, et al. Overweight and obesity (high body mass index). In: Ezzati M (Ed). Comparative quantification of health risks; global and regional burden of disease attribution to selected major risk factors. Geneva: World Health Organization, 2004:497–596.
2. WHO Expert Committee on Physical Status [Internet]. Physical status: the use and interpretation of anthropometry, report of a WHO expert committee [cited 2018 Mar 19]. Available from: [http://whqlibdoc.who.int/trs/WHO\\_TRS\\_854.pdf](http://whqlibdoc.who.int/trs/WHO_TRS_854.pdf)
3. NCD Risk Factor Collaboration. Trends in adult body-mass index in 200 countries from 1975 to 2014: a pooled analysis of 1698 population-based measurement studies with 19·2 million participants. *Lancet* 2016;387(10026):1377-96. doi: 10.1016/S0140-6736(16)30054-X.
4. Eisenberg ME, Neumark-Sztainer D, Story M. Associations of weight based teasing and emotional well-being among adolescents. *Arch Pediatr Adolesc Med* 2003;157(8):733-8.
5. Turkish Society of Endocrinology and Metabolism [internet]. Obesity diagnosis and treatment guide [cited 2018 Mar 19]. Available from: [http://temd.org.tr/admin/uploads/tbl\\_kilavuz/OBEZITE2017\\_web.pdf](http://temd.org.tr/admin/uploads/tbl_kilavuz/OBEZITE2017_web.pdf)
6. Jolly K, Lewis A, Beach J, Denley J, Adab P, Deeks JJ, et al. Comparison of range of commercial or primary care led weight reduction programmes with minimal intervention control for weight loss in obesity: lighten up randomised controlled trial.

- BMJ 2011;343:d6500. doi: 10.1136/bmj.d6500.
7. Reilly JJ. Descriptive epidemiology and health consequences of childhood obesity. *Best Pract Res Clin Endocrinol Metab* 2005;19:327–41.
  8. Fogelman Y, Vinker S, Lachter J, Biderman A, Itzhak B, Kitai E. Managing obesity: a survey of attitudes and practices among Israeli primary care physicians. *Int J Obes Relat Metab Disord* 2002;26(10):1393–7.
  9. Barnes RD, White MA, Martino S, Grilo CM. A randomized controlled trial comparing scalable weight loss treatments in primary care. *Obesity (Silver Spring)* 2014;22(12):2508-16.
  10. Ryan DH, Johnson WD, Myers VH, Prather TL, McGlone MM, Rood J, et al. Nonsurgical weight loss for extreme obesity in primary care settings: results of the louisiana obese subjects study. *Arch Intern Med* 2010;170(2):146-54. doi: 10.1001/archinternmed.2009.508.
  11. Jelalian E, Boergers J, Alday C, Frank R. Survey of physician attitudes and practices related to pediatric obesity. *Clin Pediatr* 2003;42(3):235–45.
  12. Farrell SW, Braun L, Barlow CE, Cheng YJ, Blair SN. The relation of body mass index, cardiorespiratory fitness, and all-cause mortality in women. *Obes Res* 2002;10(6):417-23.
  13. Wagner A, Simon C, Ducimetière P, Montaye M, Bongard V, Yarnell J, et al. Leisure-time physical activity and regular walking or cycling to work are associated with adiposity and 5 y weight gain in middle-aged men: the PRIME Study. *Int J Obes Relat Metab Disord* 2001;25(7):940–8.
  14. Mistik S, Oruç S, Şahin H, Kütük S. Management of obesity in family medicine and frequency of following. *Euras J Fam Med* 2017;6(1):18-25.