



Effect of Follow-Up Visit Frequencies on Weight Lost: A Historical Cohort Study

İzlem Sıklığının Kilo Kaybı Üzerine Etkisi: Bir Retrospektif Kohort Çalışması

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ABSTRACT

Aim/Background: Obesity is an important problem facing healthcare givers. Obesity care requires a comprehensive approach including diet, exercise, frequent visits and counseling. Guidelines recommend frequent follow-up visits in the first three months. However, some patients fail to attend regularly. This study was intended to examine differences in body mass index (BMI) and body fat percentage (BFP) after weight loss among overweight subjects with regular and irregular follow-up attendance. **Methods:** We designed a historical cohort study involving patients with BMI of ≥ 25 kg/m². Decreases in BMI and BFP between regular follow-up and irregular follow-up groups were evaluated at the end of three months. **Results:** 186 patients, 156 women (83.9%) and 30 men (16.1%), with a mean age of 37.8 ± 12.0 years, met the inclusion criteria. One hundred twenty-seven patients (68.3%) attended regular follow-ups and 59 patients (31.7%) attended irregularly. Significant differences were found in BMI and fat percentages between the first visit and at the end of the 3rd month in both groups ($p < 0.001$). The differences in the decreases in BMI and BFP between the two groups were significant ($p < 0.001$). **Conclusion:** Statistically significant differences were found between the regular and irregular follow-up groups in terms of decreases in BMI and fat percentages. Although regular follow-up of obese patients is recommended, even patients attending only irregularly can achieve significant weight loss.

Key words: Body fat distribution, body mass index, electric impedance, obesity, overweight

ÖZET

Amaç: Obezite sağlık hizmeti verenlerin karşılaştığı önemli bir sorundur. Obezite bakımı; diyet, egzersiz, sık izlem ve danışmanlığı içeren kapsamlı bir yaklaşım gerektirir. Kılavuzlar ilk üç ayda sık takip ziyaretleri yapılmasını önermektedir. Ancak, bazı hastalar takiplere düzenli olarak katılmamaktadır. Bu çalışma, düzenli ve düzensiz izlem sıklığına sahip olan fazla kilolu bireyler arasında, kilo verdikten sonra beden kitle indeksi (BKİ) ve vücut yağ yüzdesi (BFP) arasındaki farkları incelemeyi amaçlamıştır. **Yöntem:** BKİ ≥ 25 kg / m² olan hastaları içeren bir retrospektif kohort çalışması tasarladık. Düzenli ve düzensiz takip grupları arasında, BKİ ve BFP' de düşüş, üç ayın sonunda değerlendirildi. **Bulgular:** Dahil etme kriterlerini karşılayan 186 hastanın, 156'sı kadın (% 83,9) ve 30'u erkek (% 16,1), yaş ortalaması $37,8 \pm 12,0$ yıl idi. Takiplere 127 hasta (% 68,3) düzenli, 59 hasta (% 31,7) düzensiz olarak katılmıştı. Her iki grupta da ilk ziyaret ve 3. ay sonunda BKİ ve yağ yüzdelerinde anlamlı farklılıklar gözlemlendi ($p < 0,001$). İki grup arasında BKİ ve BFP'deki azalmadaki farklar anlamlıydı ($p < 0,001$). **Sonuç:** Düzenli ve düzensiz takip grupları arasında BKİ'deki ve yağ yüzdeleri açısından azalmalarda istatistiksel olarak anlamlı farklılıklar gözlemlendi. Her ne kadar obez hastaların düzenli olarak izlenmesi önerilse de, düzensiz takipli hastalar bile anlamlı kilo verebilirler.

Anahtar kelimeler: Vücut yağ dağılımı, vücut kitle indeksi, elektrik empedansı, obezite, fazla kiloluluk

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INTRODUCTION

The prevalence of chronic illnesses is increasing as the global population ages. Obesity is a particularly difficult problem, which occupies much of healthcare providers' time. Many procedures have been tested for the treatment of obese patients, in addition to innovative approaches as the use of serious digital games.¹ Obesity follow-up requires a comprehensive approach including rules concerning diet, motivating people to take exercise, behavioral interventions, and the provision of surgery for indicated patients.^{2,3}

Individuals with a body mass index (BMI) equal to or greater than 25 are defined as overweight, with those with BMI of 30 or more are defined as obese, according to the 2016 World Health Organization BMI Classification.⁴ The easiest way to assess overweight is to measure BMI, but BMI does not differentiate body fat. Obesity involves an increase in body fat. The follow-up of obesity should therefore also include body fat levels. Bioelectrical impedance analysis (BIA) can be used to determine body composition.^{4,5}

Ideally, regular follow-ups are recommended in order to lose weight.⁶ However, we observed that many of our patients failed to attend regular check-ups. If follow-up regularity as recommended in guidelines is related to get success on weight loss, we expect people attending irregularly could not have a significant decrease at BMI and body fat percentages (BFP).⁶ We wished to compare regular and irregular follow-up status in our patients. This study was intended to examine differences in BMI and BFP after weight loss among overweight subjects with regular and irregular follow-up attendance.

SUBJECTS AND METHODS

Study design

This historical cohort study was designed in a family medicine clinic which is specialized in obesity treatment at Karadeniz Technical University Medical Faculty, in Trabzon, Turkey. The data which has been collected between May 2014 and June 2016 were included in the study.

Selection of study subjects

Patients with age of ≥ 18 , BMI of ≥ 25 kg/m² who attended our clinic with a desire to lose weight and have data for initial and third-month follow-up visits were included in the study. We excluded patients who have a pregnancy, endogenous obesity and referred to obesity surgery. Patients attending at least one visit every month for three months were defined as the "regular follow-up group". Patients attending fewer visits than the regular group, between the initial and third follow-up visits were defined as the "irregular follow-up group". The regular follow-up group consisted of 127 patients and the irregular follow-up group of 59. There were 186 patients' data totally in the study.

Outcomes

We noted patients' descriptive characteristics, follow-up status, BMI and BFP measured during each visit using a bio-impedance body composition analyzer (Tanita BC-418MA; Tanita Corp., Tokyo, Japan) from follow-up files. Follow-up files consisted of patient descriptive characteristics, diet and exercise behaviors, physical examination and laboratory findings and notes about counseling at all control visits. Both groups received the same counseling. During counseling, we advised patients to reduce their intake of refined carbohydrates and sugar, to lower their calorie intake than daily needs, to exercise regularly as brisk walking for 150 minutes per week, to take fluid approximately 2.5 liters per day and to chew each mouthful of food several times.

Analysis

Statistical analyses were performed on Statistical Package for the Social Sciences version 18.0 software. We analyzed patients' characteristics using descriptive statistics and frequency tables. Pearson's chi-square test was used to assess the presence of any difference between the regular and irregular follow-up groups in terms of gender. The paired samples t-tests was used to compare differences in BMI and body fat percentages between the first visit and at the end of three months for the regular and irregular follow-up groups. Differences in percentage decreases in BMI and body fat percentages for both groups were compared using the independent samples t-tests. P values < 0.05 were considered statistically significant.

RESULTS

One hundred eighty-six patients, 156 women (83.9%) and 30 men (16.1%), with a mean age of 37.8 ± 12.0 years, met the inclusion criteria. The mean BMI value for the entire patient group was 34.1 ± 7.0 . One hundred twenty-seven patients (68.3%) attended regular follow-ups and 59 patients (31.7%) attended irregularly. While the median of regular group was 5 (min 4 - max 7); it was 2 (min 2 - max 5) for the irregular group. As shown in Table 1, there was no difference between the two groups in terms of baseline characteristics ($p > 0.05$).

There was no significant difference between the regular and irregular follow-up groups in terms of gender ($p = 0.516$).

As shown in table 2, significant differences were found in BMI and fat percentages between the first visit and the end of the third month in both groups ($p < 0.001$).

The decrease in BMI of 2.1 kg/m^2 was found in the regular follow-up group and of 1.1 kg/m^2 in the irregular follow-up group. A decrease in fat percentage of 2.5 was determined in the regular follow-up group and of 1.5 in the irregular group. As shown in table 2, the differences in the decreases in BMI and fat percentage between the two groups were statistically significant ($p < 0.001$).

	Regular follow-up	Irregular follow-up	p values
Age – years*	36.8 ± 12.3	39.8 ± 10.9	0.103
BMI - kg/m ² *	34.7 ± 7.5	32.7 ± 5.5	0.067
Fat percentage %*	38.6 ± 8.3	38.1 ± 7.3	0.655

*(mean \pm SD)

	Regular follow-up group					Irregular follow-up group					p
	First	Third month	95% CI for the difference		p	First	Third month	95% CI for the difference		p	
			Lower	Upper				Lower	Upper		
BMI kg/m ²	34.7 ± 7.5	32.5 ± 7.3	1.9	2.4	<0.001	32.7 ± 5.5	31.5 ± 5.0	0.7	1.5	<0.001	
Fat percentage %	38.6 ± 8.3	36.0 ± 8.8	2.1	2.9	<0.001	38.1 ± 7.3	36.6 ± 7.4	0.9	2	<0.001	
Decrease at BMI kg/m ² *	$2.1 \pm 1.5 (6.3)$					$1.1 \pm 1.6 (3.2)$					<0.001
Decrease at BFP %*	$2.5 \pm 2.3 (7.1)$					$1.4 \pm 2.1 (4.0)$					0.004

CI: Confidence Interval

BMI: Body Mass Index

BFP: Body Fat Percentage

*Decrease at the end of 3rd month [Mean \pm SD (%)]

DISCUSSION

Statistically significant differences were found between the regular follow-up and irregular follow-up groups in terms of decreases in BMI and fat percentages. Significant decreases in BMI and body fat percentages were also found between baseline and the third month in the irregular follow-up group.

The regular follow-up rate in our study was approximately 70%. The US Preventive Services Task Force (USPSTF) recommends a follow-up frequency of once a week in the first month, every other week for the next four months, and monthly thereafter.⁷ In our daily practice at our clinic, we advise our patients to attend for a check-up once every 15 days, although in this study we defined regular follow-up as one visit a month.

When we compare the decrease in BMI with the literature; one study reported a mean decrease of 1 kilo with quarterly follow-ups at the end of 12 months.⁸ Our results appear better than this after only three months. This may be because we obtained these findings in three months, and the best results are known to be achieved at the beginning of the weight loss period. As the number of patients with longer follow-up was not sufficient in our study, patients with a follow-up of 3 months were taken into the study.

Compared with the irregular group, the decreases in BMI and body fat were significantly higher in the regular follow-up group. In one study evaluating the effectiveness of using medical assistants (MA), the control group received quarterly primary care provider visits and weight loss materials, while the study group received brief counseling during eight visits from an MA over six months. The control group lost 0.9 ± 0.6 kg ($1.0 \pm 0.7\%$ of initial weight) and the brief counseling group lost 4.4 ± 0.6 kg ($5.1 \pm 0.7\%$).⁹ In accordance with guidelines, we recommend frequent and regular visits, especially in the first three months of follow-up.

Most previous studies have compared procedures involving quarterly routine care, additional brief counseling with MAs and medical treatment. One systematic review concluded that one visit per month or fewer in primary care was not effective for weight loss.^{10,11} Another study of obese adults compared the effectiveness of routine care, consisting of quarterly primary care provider visits (including information concerning weight management), with brief lifestyle counseling, consisting of routine care combined with lifestyle

coaches providing brief monthly sessions about behavioral weight control and enhanced brief lifestyle counseling (plus meal replacement or medication). Mean weight loss values following routine care, brief lifestyle counseling, and enhanced brief lifestyle counseling were 1.7 ± 0.7 , 2.9 ± 0.7 , and 4.6 ± 0.7 kg, respectively, at the end of two years.¹²

Significant differences in BMI and body fat percentages indicates that even if patients attended follow-up only irregularly, they still exhibited statistically significant levels of weight and fat loss by the end of the third month. Our research suggests that even irregular follow-up is still effective. However, the decreases were significantly greater in the regular follow-up group than in the irregular group.

The strengths of the study

Our scan of the literature revealed no studies comparing regular and irregular follow-up visits over a three-month period. This represents a distinguishing feature of the present study.

The limitations of the study

The principal limitation of this study is a three-month follow-up period. Longer follow-up could give clearer results. However, we think that our results are important to give an opinion to show the influence of the follow-up visit frequencies. Another limitation is that we did not ask the reason why they could not attend regularly. Patients who are successful will like to show that; patients who are not may be embarrassed or are reluctant to have a conversation on their 'failure'. There should be a good idea to organize a qualitative study to find out the reasons for not attending.

CONCLUSION

Although regular follow-up of obese patients is recommended, even patients attending only irregularly can also lose significant amounts of weight. It is essential to monitor all overweight subjects in order to facilitate weight loss. However, further work is still needed to improve regular follow-up rates. Because of the high evidence value of the recommendations of the guidelines, we should still recommend frequent follow-up to our patients. We expect our results to be a guide in

counseling for obese individuals in family medicine practices.

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Conflicts of interest

The authors state that they have no conflict of interest.

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