DOI: 10.24938/kutfd.1306987 Kırıkkale Üniversitesi Tıp Fakültesi Dergisi 2023;25(2):248-259
Original Article *Özgün Araştırma*

EVALUATION OF THE LEVEL OF PHYSICAL ACTIVITY AND QUALITY OF LIFE IN PATIENTS REGISTERED TO THE OBESITY CENTER: SAMSUN PROVINCE EXAMPLE

Obezite Merkezine Kayıtlı Hastalarda Fiziksel Aktivite Düzeyi ve Yaşam Kalitesinin Değerlendirilmesi: Samsun İli Örneği

Emine ÖZTÜRK KARATEPE[1] Mahcube ÇUBUKÇU[2] Nur ŞİMŞEK YURT[3]

[1] *Clinic of Family Medicine, Aralık State Hospital, IĞDIR, TÜRKİYE*
[2] *Department of Family Medicine, Samsun University Faculty of Medicine, SAMSUN, TÜRKİYE*
[3] *Clinic of Family Medicine, Samsun Training and Research Hospital, SAMSUN, TÜRKİYE*

ABSTRACT

Objective: Obesity centers are established centers that enable people to reach and maintain their ideal weight by offering lifestyle changes. The aim of this study was to determine the physical activity and quality of life levels of patients registered in the obesity center and to examine their relationship with obesity.

Material and Methods: Of 652 patients admitted to an obesity center between October 1, 2019, and January 30, 2020, 118 met the inclusion criteria. Patients whose informed consent was obtained were evaluated through the medium of a questionnaire containing socio-demographic data, the International Physical Activity Questionnaire, and the SF-36 Quality of Life Form.

Results: Of the patients enrolled in the study, 81.4% were female. The mean age of the patients was 46.7±11.5 years, the mean body mass index (BMI) was 37.7±6.2 kg/m². A statistically significant difference was found between obese classes and educational status, occupational groups, presence of chronic disease; hypertension, diabetes, and hyperlipidemia (respectively; p=0.040, p=0.026, p=0.031, p=0.011, p=0.001 and p<0.001). Diabetes was determined as an independent risk factor in the presence of morbid obesity (p=0.002). Morbid obese people scored significantly lower in terms of SF-36 quality of life sub-dimensions compared to class I and II obese patients.

Conclusion: It has been determined that as BMI increases in obese patients, the level of physical activity and quality of life decreases. We think that multidisciplinary institutions such as obesity centers are important for individuals to reach their ideal weight and acquire the right lifestyle habits.

Keywords: *Obesity, quality of life, exercise, morbid obesity*

ÖZ

Amaç: Obezite merkezleri, yaşam tarzı değişiklikleri sunarak insanların ideal kilolarına ulaşmalarını ve kilolarını korumalarını sağlayan merkezlerdir. Bu çalışmanın amacı, obezite merkezine kayıtlı hastaların fiziksel aktivite ve yaşam kalitesi düzeylerinin belirlenerek obezite ile ilişkisinin incelenmesidir.

Gereç ve Yöntem: 1 Ekim 2019 ile 30 Ocak 2020 tarihleri arasında obezite merkezine başvuran 652 hastanın 118'i çalışmaya dahil edildi. Aydınlatılmış onamı alınan hastalar, sosyodemografik verileri içeren bir anket, Uluslararası Fiziksel Aktivite Anketi ve SF-36 Yaşam Kalitesi Formu aracılığıyla değerlendirildi.

Bulgular: Çalışmaya alınan hastaların %81.4'ü kadındı. Hastaların yaş ortalaması 46.7±11.5 yıl, ortalama beden kitle indeksi (BKİ) 37.7±6.2 kg/m² idi. Obezite derecesi ile eğitim durumu, meslek grupları, hipertansiyon, diyabet ve hiperlipidemi arasında istatistiksel olarak anlamlı fark bulundu (sırasıyla; p=0.040, p=0.026, p=0.031, p=0.011, p=0.001 ve p<0.001). Morbid obezite varlığında diyabet bağımsız bir risk faktörü olarak belirlendi (p=0.002). Morbid obezler SF-36 yaşam kalitesi alt boyutlarında sınıf I ve II obez hastalara göre anlamlı derecede daha düşük puan aldı.

Sonuç: Obez hastalarda BKİ arttıkça fiziksel aktivite düzeyinin ve yaşam kalitesinin düştüğü belirlendi. Bireylerin ideal kiloya ulaşabilmeleri ve doğru yaşam tarzı alışkanlığını kazanabilmeleri için obezite merkezleri gibi multidisipliner kurumların önemli olduğunu düşünmekteyiz.

Anahtar Kelimeler: *Obezite, yaşam kalitesi, egzersiz, morbid obezite*

Correspondence / Yazışma Adresi: **Dr. Nur ŞİMŞEK YURT**
Clinic of Family Medicine, Samsun Training and Research Hospital, SAMSUN, TÜRKİYE
Phone / Tel: +905068775351 **E-mail** / E-posta: nursimsekyurt@gmail.com
Received / Geliş Tarihi: 30.05.2023 **Accepted** / Kabul Tarihi: 02.08.2023

KÜ Tıp Fak Derg 2023;25(2):248-259
Doi: 10.24938/kutfd.1306987

INTRODUCTION

Obesity is defined as abnormal and excessive fat cumulation in the body that can derange health (1). The World Health Organization recommends the use of body mass index (BMI) of the assessment of obesity (2). Individuals above the age of 18 with a BMI of 25-29.9 kg/m^2 are classified as overweight or pre-obese, and those who have a BMI of more than 30 kg/m^2 are classified as obese (3). Obesity is the second most significant preventable cause of death subsequent to smoking (4). The prevalence of obesity is increasing across the world, regardless of geographic location, ethnicity, or socioeconomic status, at all ages and in both genders and has become one of the biggest health problems of our time. According to TURDEP-II obesity data, it has been reached that there exist obese individuals at the rate of 29.5% among adults aged 20 and above in our country (4).

Obesity is a risk factor for numerous medical conditions, including endocrine and metabolic disorders, certain cancer types and cardiovascular diseases (5). In addition to these health risks, it has been reported that adverse effects on quality of life and impairment in quality of life are correlated with the degree of obesity (6). Obese people have an increased risk of body image impairment, low self-esteem, depression, and anxiety. These individuals are rejected from business circles and school environments, they have difficulty finding a job, marriage rates decrease because their interpersonal relationships are deemed problematic, and adverse economic and social consequences emerge (7). Today, incidental to the rapid development of industrialization and technology, a serious decrease in terms of the physical activity levels of individuals has occurred. It has been reported that lack of physical activity accounted for the development of obesity at a rate of 67.5% and the most important cause of obesity in men is a sedentary lifestyle (8).

Obese patients cannot lose weight effectively because they do not transform their dietary regime and exercise practices into a lifestyle, and they cannot maintain their weight even if they succeed to lose weight. In this long process, patients have a higher chance of success thanks to a multidisciplinary team. The role of healthy life centers in nutrition and physical activity is important, in addition, consultancy services are provided in different disciplines such as chronic diseases, women's and reproductive health, child and adolescent health, tobacco and substance abuse (9). In order to implement a more effective and sustainable struggle in the treatment of obesity, it was stipulated to open obesity centers in pursuance of the 2018/29 Circular of the Ministry of Health (10). Obesity centers are task oriented established centers that enable people to reach and maintain their ideal weight by offering and bringing in lifestyle changes. Obesity centers enable patients to maintain their ideal weight by providing them with the right lifestyle changes (11). Patients with a BMI of 30 kg/m² and above are admitted to obesity centers. The patients are trained by physicians, dieticians, physiotherapists, psychologists, and the nurses in charge of the centers over a 3-month period (12). Individuals are planned to reach their target weight with diet and exercise programs and a medical approach under the control of a physician. It is tried to ensure that people who have achieved the target weight maintain their healthy living skills and weight, change their environmental and social habits, and maintain their permanent weight. If the target weight is less than the total weight to be lost, the repetition of the program and the timing of re-determining the target weight and starting to lose weight are planned (13). All obesity centers in Turkey use the common program called 'Obesit' as established by the Ministry (14).

This study is significant with regard to the fact that it was conducted in a center that performs a holistic approach to obese patients with a multidisciplinary team. The aim of this study was to determine the physical activity and quality of life levels of patients registered in the obesity center and to examine their relationship with obesity.

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MATERIALS AND METHODS

Study population and design

The study was conducted under the original Declaration of Helsinki and ethical approval to conduct this study was granted by the hospital's ethics committee on June 25, 2019 (decision number GOKA/2019/12/92). All participants gave written informed consent. This cross-sectional, descriptive study was carried out at the Health Sciences University Samsun Training and Research Hospital Obesity Center between October 1, 2019, and January 30, 2020. The number of patients registered in the obesity center was 252, and when the obesity frequency in the center was accepted as 90%, the sample size was calculated as at least 115 with 80% power, 95% confidence interval and 5% acceptable margin of error. Patients who were 18 years of age and older, who had a BMI of 30 kg/m² and above, who were conscious, and who had no physical or mental problems that would interfere with communication were included in the study, whose informed consent was obtained from the patients registered in the obesity center to participate in the study. Patients with a BMI<30 kg/m², who could not communicate mentally, were illiterate, whose data were incomplete and who did not have permission to participate in the study were excluded from the study. A total of 118 patients were included in our study. The study data were collected by the researchers through face-to-face interviews with the participants.

Sociodemographic data collection form

A descriptive questionnaire including age, sex, height, weight, BMI marital status, educational status, occupation, income level, place of residence, smoking and alcohol use habits, presence of chronic diseases and regular drug use information was applied to the participants.

According to the Turkish Society of Endocrinology and Metabolism guideline, patients with a BMI≥30.0-34.9 kg/m² were defined as class I or slightly obese, 35.0-39.9 kg/m² as class II or moderately obese, 40 kg/m² as class III or morbidly obese (4).

International Physical Activity Questionnaire (IPAQ)

Moreover, the short form of the IPAQ was applied. Turkish validity and reliability study of the questionnaire developed by Craig et al. was conducted by Saglam et al. in 2010 (15,16). Calculation of the total score of the short form includes the sum of the period (minutes) and frequency (days) of sitting, walking, mild activity, and intensive activity. Physical activity level is classified into three groups: inactive, minimal active and extremely active according to the total score result.

36-Item Short Form Survey (SF-36)

The SF-36 form was used to evaluate the quality of life of the participants. SF-36 was developed back in 1992 by Ware, Turkish validity and reliability study was conducted by Kocyigit et al.(17,18). Consisting of 36 questions, the SF-36 scale evaluates two main headings (physical and mental dimensions) and eight concepts (physical function, physical role difficulty, emotional role difficulty, energy-vitality, mental health, social functionality, pain, general health perception). The score of each sub-dimension in the scale varies between 0-100. The SF-36 scale, which has a positive score is graded in a manner that improves the quality of life in direct proportion as the score of each health related aspect increases (17).

Statistical Analysis

Statistical Package for the Social Sciences (SPSS) version 23.0 software (IBM Corp) was used for the data analysis in the present study. Conformity with the normal distribution was examined by Kolmogorov Smirnov and Shapiro Wilk. Independent samples t-test and one-way analysis of variance (ANOVA) were used to compare normally distributed data. Mann Whitney U test and Kruskal Wallis tests were used to compare data that did not show normal distribution. The independent variables affecting morbid obesity and physical activity were analyzed by binary logistic regression analysis. Normally distributed data were presented as mean ± standard deviation. Data that did not show normal distribution were given as median (minimum–maximum). Pearson Chi-square test was used to compare categorical data. Categorical data were

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presented as frequency (percentage). p<0.05 was considered significant.

RESULTS

The total number of patients in the study was 118, of which 81.4% were women. While the mean age of the patients was 46.7±11.5 years, the mean BMI was 37.7±6.2. Patients aged 25-64 years were 90.7% (n=107) and those aged 65 years or older were 5.9% (n=7). When the patients were evaluated according to BMI, 39.8% (n=47) were slightly or class I obese, 35.6% (n=42) were moderately or class II obese, 24.6% (n=29) were morbidly obese. The education level of 76.3% (n=90) of patients corresponds to high school or less and 59.3% of them were not working. The rate of active smoking was 18.6% (n=22). While the presence of chronic disease was present among 65.3% (n=77) of the patients, 33.9% (n=30) had hypertension, 39% (n=46) had diabetes, 29.7% (n=35) had hyperlipidemia (Table 1).

A statistically significant difference was obtained between the classes of obesity and the presence of chronic disease (p=0.031). While 36.4% of those with chronic disease belong to the class II obese group, 53.7% of those without chronic disease belong to the class I obese group. A significant difference was found between obese classes and hypertension, diabetes, and hyperlipidemia (p=0.011, p=0.001, p<0.001, respectively) 40% of those with hypertension belong to the class II obese group, while 43.5% of those with diabetes and 48.6% of those with hyperlipidemia belong to the morbidly obese group (Table 2).

In the presence of morbid obesity, independent risk factors were analyzed by binary logistic regression analysis as univariate and multivariate models. Diabetes was identified as an independent predictor for morbid obesity (univariate analysis result, odds ratio [OR]: 5.385, 95% confidence interval [CI], 2.168-13.374, p<0.001); multivariate analysis result OR: 18.687, 95% CI, 2.864-121.936, p=0.002) (Table 3).

Table 1: Sociodemographic characteristics and clinical data of patients (n=118)

Variables	N	%
Gender		
Female	96	81.4
Male	22	18.6
Age (years)		
18-24	4	3.4
25-64	107	90.7
≥65	7	5.9
BMI categorical (range)		
Class I obesity (30.0 to 34.9)	47	39.8
Class II obesity (35.0 to 39.9)	42	35.6
Class III obesity (≥40.0)	29	24.6
Marital Status		
Married	99	83.9
Single/divorced	19	16.1
Occupation		
Not working	70	59.3
Retired	22	18.6
Desk job	16	13.6
Physical job	10	8.5
Educational level		
Less than secondary graduation	90	76.3
Postsecondary graduation	28	23.7
Smoke		
No	96	81.4
Yes	22	18.6
Chronic Disease		
Yes	77	65.3
No	41	34.7
Hypertension		
Yes	40	33.9
No	78	66.1
Cardiovascular disease		
Yes	11	9.3
No	107	90.7
Diabetes mellitus		
Yes	46	39.0
No	72	61.0
Asthma		
Yes	10	8.5
No	108	91.5
Hyperlipidemia		
Yes	35	29.7
No	83	70.3
Depression		
Yes	19	16.1
No	99	83.9
Hypothyroidism		
Yes	21	17.8
No	97	82.2

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Table 2: Comparison of patient data with obesity classification

Variables	Class I obesity (n=47)	Class II Obesity (n=42)	Class III obesity (n=29)	p
Gender				
Female	39 (40.6)	33 (34.4)	24 (25.0)	0.846
Male	8 (36.4)	9 (40.9)	5 (22.7)	
Marital Status				
Married	40 (40.4)	33 (33.3)	26 (26.3)	0.439
Single	7 (36.8)	9 (47.4)	3 (15.8)	
Occupation				
Not working	33 (47.1)	19 (27.1)	18 (25.7)	**0.026**
Retired	8 (36.4)	9 (40.9)	5 (22.7)	
Desk job	4 (25.0)	11 (68.8)	1 (6.3)	
Physical job	2 (20.0)	3 (30.0)	5 (50.0)	
Education				
Less than secondary graduation	32 (35.6)	31 (34.4)	27 (30.0)	**0.040**
Postsecondary graduation	15 (53.6)	11 (39.3)	2 (7.1)	
Age				
18-24	2 (50.0)	2 (50.0)	0 (0)	0.223
25-64	44 (41.1)	38 (35.5)	25 (23.4)	
65 or older	1 (14.3)	2 (28.6)	4 (57.1)	
Smoke				
No	41 (42.7)	34 (35.4)	21 (21.9)	0.272
Yes	6 (27.3)	8 (36.4)	8 (36.4)	
Chronic Disease				
Yes	25 (32.5)	28 (36.4)	24 (31.2)	**0.031**
No	22 (53.7)	14 (34.1)	5 (12.2)	
Hypertension				
Yes	9 (22.5)	16 (40.0)	15 (37.5)	**0.011**
No	38 (48.7)	26 (33.3)	14 (17.9)	
Diabetes mellitus				
Yes	12 (26.1)	14 (30.4)	20 (43.5)	**0.001**
No	35 (48.6)	28 (38.9)	9 (12.5)	
Hypothyroidism				
Yes	10 (47.6)	8 (38.1)	3 (14.3)	0.464
No	37 (38.1)	34 (35.1)	26 (26.8)	
Hyperlipidemia				
Yes	5 (14.3)	13 (37.1)	17 (48.6)	**<0.001**
No	42 (50.6)	29 (34.9)	12 (14.5)	
Depression				
Yes	7 (36.8)	7 (36.8)	5 (26.3)	0.957
No	40 (40.4)	35 (35.4)	24 (24.2)	
Asthma				
Yes	5 (50.0)	1 (10.0)	4 (40.0)	0.187
No	42 (38.9)	41 (38.0)	25 (23.1)	

* $\chi 2$: Pearson chi-square test

** Bold values define the statistical significance of $p<0.05$

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Table 3: Univariate and multivariate logistic regression analysis for determining the independent predictors of the significant morbid obesity

	Univariate analysis				Multivariate analysis			
Variables	**β**	**SE**	**OR (%95 CI)**	**P**	**β**	**SE**	**OR (%95 CI)**	**P**
Marital Status (Single)	-0.642	0.669	0.526(0.142–1.955)	0.338	0.460	0.839	1.583(0.306–8.203)	0.584
Age (<65)	0.529	0.445	1.698(0.71–4.059)	0.234	1.166	0.749	3.209(0.739–13.931)	0.120
Diabetes mellitus	1.684	0.464	5.385(2.168–13.374)	**<0.001**	2.928	0.957	18.687(2.864–121.936)	**0.002**
Not working	0.062	0.212	1.064(0.702–1.612)	0.770				
Education (Less than secondary graduation)	-1.718	0.769	0.179(0.04–0.81)	**0.026**	1.677	1.137	0.187(0.02–1.738)	0.140
Gender (female)	-0.125	0.561	0.882(0.294–2.648)	0.823	-1.196	0.919	0.302(0.05–1.831)	0.193

* OR: Odds ratio; CI: Confidence interval
** Bold values define the statistical significance of p<0.05

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51.7% of the patients in our study were found to be inactive, 43.2% were found to be minimally active and 5.1% were found to be extremely active. A statistically significant difference was found between physical activity levels, obesity classes and educational status (p=0.005, p=0.036, respectively). While 72.4% of the morbidly obese were included in the physically inactive group, there were no class II obese and morbidly obese individuals in the physically extremely active group. While 57.8% of the high school graduates and below group were inactive, 32.1% of the university graduate and higher group were found to be inactive. Those with a university education level and above were more active than those with a high school education level and below (Table 4). When the independent risk factors affecting physical activity were analyzed by logistic regression, it was determined that education status was an independent predictor (univariate analysis result OR:2.889, 95% CI, 1.178-7.082, p=0.020; multivariate analysis result OR:4.158, 95% CI, 1.275- 13.558, p=0.018).

Table 4: Comparison of patient data with physical activity levels

Variables, n (%)	Inactive (n=61)	Minimally active (n=51)	Extremely active (n=6)	p
BMI category (range)				
Obese Class I (30.0 to 34.9)	20 (42.6)	21 (44.7)	6 (12.8)	**0.005**
Obese Class II (35.0 to 39.9)	20 (47.6)	22 (52.4)	0 (0)	
Obese Class III (≥ 40.0)	21 (72.4)	8 (27.6)	0 (0)	
Gender				
Female	47 (49.0)	43 (44.8)	6 (6.3)	0.299
Male	14 (63.6)	8 (36.4)	0 (0)	
Marital Status				
Married	54 (54.5)	39 (39.4)	6 (6.1)	0.122
Single	7 (36.8)	12 (63.2)	0 (0)	
Occupation				
Not working	34 (48.6)	32 (45.7)	4 (5.7)	0.497
Retired	13 (59.1)	8 (36.4)	1 (4.5)	
Desk job	6 (37.5)	9 (56.3)	1 (6.3)	
Physical job	8 (80.0)	2 (20.0)	0 (0)	
Education				
Less than secondary graduation	52 (57.8)	33 (36.7)	5 (5.6)	**0.036**
Postsecondary graduation	9 (32.1)	18 (64.3)	1 (3.6)	
Age				
18-24	2 (50.0)	2 (50.0)	0 (0)	0.951
25-64	55 (51.4)	46 (43.0)	6 (5.6)	
65<	4 (57.1)	3 (42.9)	0 (0)	
Smoke				
No	46 (47.9)	44 (45.8)	6 (6.3)	0.164
Yes	15 (68.2)	7 (31.8)	0 (0)	
Chronic Disease				
No	23 (56.1)	17 (41.5)	1 (2.4)	0.564
Yes	38 (49.4)	34 (44.2)	5 (6.5)	
Hypertension				
No	39 (50.0)	35 (44.9)	4 (5.1)	0.872
Yes	22 (55.0)	16 (40.0)	2 (5.0)	
Diabetes mellitus				
No	37 (51.4)	31 (43.1)	4 (5.6)	0.958
Yes	24 (52.2)	20 (43.5)	2 (4.3)	
Hyperlipidemia				
No	42 (50.6)	35 (42.2)	6 (7.2)	0.264
Yes	19 (54.3)	16 (45.7)	0 (0)	

* $\chi 2$: Pearson chi-square test
** Bold values define the statistical significance of p<0.05

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When the relationship between obesity classes and quality of life sub-dimensions is examined, statistically significant differences were observed in terms of physical function, physical role difficulty, energy-vitality, mental health and general health perception, and this difference is due to the lower scores of the morbidly obese group compared to the other groups (Table 5).

Table 5: Comparison of SF-36 subscales with obesity classification

Variables	Obese Class I (BMI 30.0 to 34.9)		Obese Class II (BMI 35.0 to 39.9)		Obese ClassIII (BMI ≥ 40.0)		p
Physical function	88.1±12.7	95 (45-100)a	82.9±17.3	90 (35-100)a	68.8±22.3	60 (30-100)b	**0.001**
Physical role difficulty	78.2±35.6	100 (0-100)a	73.2±36.4	100 (0-100)ab	53.4±41	50 (0-100)b	**0.019**
Emotional role difficulty	73±51.8	66.6 (0-333)	71.4±32.6	66.6 (0-100)	72.4±82.1	66.6 (0-333)	0.435
Energy vitality	60±24a	60 (5-100)	60.8±23a	60 (10-100)	47.6±16.6b	50 (0-70)	**0.028**
Mental health	66.5±18.6a	64 (16-100)	68.4±18.3a	68 (16-100)	55.9±18.2b	56 (24-92)	**0.015**
Social functionality	99.5±117	87.5 (50-875)	85.7±20.2	100 (37.5-100)	72±26.2	75 (12.5-100)	0.056
Pain	74.4±24.4	77.5 (22.5-100)	76.4±21.5	78.8 (35-100)	60.9±27.8	67.5 (0-100)	0.050
General health perception	59±23.5a	60 (5-100)	60.2±25.1a	60 (20-100)	44.7±21.7b	45 (0-85)	**0.015**

* $\chi 2$: Kruskal-Wallis test, F: One-way analysis of variance (ANOVA) test statistic
** Bold values define the statistical significance of $p<0.05$

DISCUSSION

Obesity is a public health problem that is aggravating with respect to prevalence in our country as well as in the entire world and creates significant economic costs (19). The fight against obesity necessitates a long process and throughout this process, patients should be observed under a holistic approach with a multidisciplinary team. Our study was carried out in an obesity center that complies with these criteria.

According to our study, most of the patients (81.4%) who applied to the obesity center were women. According to the Turkish Statistical Institute's 2016 data, obesity prevalence was higher among women (23.9%) than it is among men (15.2%) (20). Similar results were found in the study conducted by Yildirim et al. in an obesity center (11). The fact that obesity is more common in women is attributed to the increasing effect of estrogen on adipose tissue and the lack of physical activity among women (21). 90.7% of the individuals participating in our study were included in the adult group between the ages of 25-64. The obesity level was significantly lower in the young adult group and those aged 65 and above. According to the data of the TURDEP II study, obesity increases linearly between the ages of 20-45 in both genders, reaches a plateau between the ages of 45-65 and tends to decrease significantly from the age of 65 (4).

In our study, the frequency of class I obesity was found to be 39.8%, and it was found to be higher than the other obese classes. In general, most obese patients have a body mass index of 30-35 kg/m² (Class I) (21). In the TURDEP- I and TURDEP-II studies, class I obesity is the most frequent (4). In our study, 76.3% of the participants received high school or a lower level of education. When the relationship between education level and obesity classes was examined, 35.6% of people with high school degree or lower education level were in the class I obese group, while class I obesity was found to be higher corresponding to 53.6% among the university graduates and above group. Akbas et al. reported that obesity was negatively correlated with education level (22). It is contemplated that this situation arises from the fact that educated people are generally attentive to being healthy, their interest, awareness and knowledge in physical activity is at a higher level, and the recommendations for the treatment of obesity are correctly perceived by them.

Within the scope of our study, 65.3% of the participants had a foreknown and diagnosed chronic disease. In our study, a statistically significant relationship was

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obtained between the classes of obesity and the presence of chronic disease. While class I obesity was most common in those without chronic disease, class II obesity was most common in those diagnosed with chronic disease. The obesity class is of great importance in terms of diseases and complications accompanying obesity (11). It was confirmed that 39% of the participants in our study were also diagnosed with diabetes. While 43.5% of those with diabetes are included in the morbidly obese group, 48.6% of those without diabetes are included in the class I obese group. According to the previously conducted studies which are similar and in parallel with our study, it is seen that as BMI increases the frequency of type 2 diabetes also increases (23, 24). In our study, 40% of those diagnosed with hypertension were included in the class II obese group, while 48.7% of those without hypertension were included in the class I obese group. The prevalence of hypertension increased as BMI increased, which was similar to other studies' findings (25).

In our study, a statistically significant difference was obtained between physical activity levels and obesity classes. While 72.4% of the morbidly obese were included in the physically inactive group, there were no class II obese and morbidly obese individuals included in the physically extremely active group. According to the study conducted by Veli et al. and based on the BMI classification of the participants, 26.1% of those with normal weight, 15.1% of those who were overweight and 13.6% of those who were obese practiced adequate physical activity (26). In the study by Hemmingsson et al., while the relationship between physical activity and BMI was weak in non-obese individuals, BMI was found to be highly correlated with physical activity among obese individuals (27). In our study, a statistically significant difference was obtained between physical activity levels and educational status. This difference is due to the fact that 57.8% of the group with high school degree and below was found to be physically inactive, while 64.3% of the university graduates and higher degree holding group was determined to be active at a minimum level. According to the studies conducted by Hamer et al. and Farrel et al. it was found that there is a positive correlation between education status and physical activity level (28,29). It is contemplated that the expansion of physical activity awareness among people with high education level is reflected in the conclusions of the study.

In our study, when the BMIs of the individuals were divided into three categories as class I obese, class II obese and class III obese, a statistically significant relationship was found between occupation, education level, presence of chronic disease, hypertension, diabetes, and hyperlipidemia. As a result of the univariate analysis, diabetes, and education status, and according to the multivariate analysis, diabetes, physical work, and smoking were determined as independent predictors in the presence of morbid obesity. It has been reported that metabolic dysfunction, which is initiated with insulin resistance in obesity, progresses to prediabetes, followed by type 2 diabetes. Therefore, regular screening and follow-up of obese cases is recommended to cease the progression to diabetes and prevent complications (4). According to the study of Nazlican et al., independent risk factors in the presence of obesity were found to be age, marital status, presence of additional disease, bread consumption, time spent standing and fast bite consumption habits (30).

With reference to the conducted studies it has been reported that the quality of life among obese individuals is poorer and in parallel with this conclusion weight loss improves and enhances the quality of life as stated in numerous studies (31,34). In our study, when the relationship between SF-36 sub-dimensions and obesity classes was examined, a statistically significant difference was found between physical function, physical role difficulty, energy-vitality, mental health, and general health perception. Morbid obese people scored significantly lower in all these sub-dimensions compared to class I and II obese patients. Ucan et al. reported that obesity, hypertension and diabetes reduce the quality of life, the coexistence of obesity and hypertension in particular affects the quality of life in a more adverse manner (35).

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The strength of our study is that obesity centers are relatively new organizations and will contribute to the literature. The limitation of our study is the fact that the target population is rather limited, it is a monocenter study, most of the participants are women, and the surveys for the participants were not administered at the same class of the education process.

Most individuals applying to the obesity center are women, they are between the ages of 25-64, married, unemployed, and either hold a high school degree or have an educational background at a lower level. While class I obesity was the most common, chronic disease rate was 65.3%, diabetes rate was 39%. Diabetes has been identified as an independent risk factor for morbid obesity.

It was determined that as the BMI of the patients increased, the level of physical activity decreased. Education level was determined as an independent risk factor in terms of physical activity. Similarly, it has been observed that as the BMI of individuals increases, their quality of life becomes poorer. The result of all these studies demonstrates the significance of the existence of institutions that provide multidisciplinary training, such as obesity centers, to improve the quality of life of individuals, to help them lose weight and to ensure their sustainability.

Conflict of interest: The author have no conflicts of interest to declare.

Support and Acknowledgment: No financial support was received from any institution or person..

Researchers' Contribution Rate Statement: Concept/Design: EÖK, MC; Analysis/Interpretation: EÖK, NŞY ; Data Collection: EÖK, NŞY; Writer: EÖK, MC; Critical Review: MC, NŞY; Approver: EÖK, NŞY, MC

Ethics Committee Approval: Approval of this study was granted by Samsun Research and Training Hospital ethics committee on June 25, 2019 (decision number GOKA/2019/12/92).

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