ORIGINAL RESEARCH

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Evaluation of Health Literacy and Obesity-related Well-being in Obese Adults

Obez Yetişkinlerde Sağlık Okuryazarlığının ve Obeziteyle İlişkili İyi Olma Halinin Değerlendirilmesi

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Abstract

Objective: Obesity can cause many diseases and reduces the quality of life. Health literacy (HL) can play a decisive role in terms of the health status of the obese person. In this study; it was aimed to evaluate the relationship between HL and obesity-related well-being in obese adults and examine the affecting factors.

Method: This cross-sectional study consisted of individuals aged 18-65 years who were admitted to the family medicine outpatient clinic of a tertiary hospital, between April and July, 2022, with a body mass index (BMI) of 30 kg/m^2 and above for the last year, and who met the inclusion criteria. The patient information form, the obesity-related well-being questionnaire (ORWELL 97-TR), and the health literacy scale-short form (HLS-SF) was used to obtain data.

Results: Among 201 participants in the study, 70.6% (n=142) were mildly obese. The mean value of the HLS-SF index score was 32.71±9.93, and the ORWELL 97-TR total score was 41.22±14.86. A significant correlation was determined between HLS-SF and ORWELL 97-TR relevance-"social relations" sub-dimension score (r=0.292; p<0.001). There was a significant difference between the HLS-SF score and obesity duration (p=0.030), weight change in the last year (p=0.048), diet (p=0.048), and exercising (p<0.001). A significant difference was observed between ORWELL 97-TR total score and age (p=0.007), educational status (p=0.001), BMI (p=0.016), weight change in the last year (p=0.001), diet (p<0.001) and exercising (p=0.009).

Conclusion: According to the scores obtained from the scales in this study, the quality of life of the participants was moderate, while HL was found to be moderate-good. However, as HL increased, the quality of life

Öz

Amaç: Obezite; pek çok hastalığa yol açabilmekte olup yaşam kalitesini de düşürmektedir. Sağlık okuryazarlığı (SOY) ise obez kişinin sağlık durumu açısından belirleyici rol oynayabilmektedir. Bu çalışmada; obez yetişkinlerde SOY ile obeziteyle ilişkili iyi olma hali arasındaki ilişkinin değerlendirilmesi ve etkileyen faktörlerin incelenmesi amaçlanmıştır.

Yöntem: Kesitsel bu çalışma; üçüncü basamak bir hastanenin aile hekimliği polikliniğine Nisan-Temmuz 2022 tarihleri arasında başvuran 18-65 yaş arası kişilerden, son 1 yıldır beden kitle indeksi (BKİ) 30 kg/m^2 ve üzeri olan ve çalışmaya dahil etme kriterlerini karşılayanlar ile gerçekleştirildi. Verileri elde etmede; hasta bilgi formu, obezite ile ilişkili iyi olma anketi (ORWELL 97-TR) ve sağlık okuryazarlığı ölçeği-kısa form (SOY-KF) kullanıldı.

Bulgular: Çalışmaya dahil edilen 201 katılımcının %70,6'sı (n=142) hafif obez idi. SOY-KF indeks puanı 32,71±9,93, ORWELL 97-TR toplam puanı 41,22±14,86 idi. SOY-KF ile ORWELL 97-TR Alaka- "sosyal ilişkiler" alt boyut puanı arasında anlamlı ilişki saptandı (r=0,292; p<0,001). SOY-KF puanı ile obezite süresi (p=0,030), son 1 yılda kilo değişimi (p=0,048), diyet (p=0,048) ve egzersiz yapma (p<0,001) arasında istatistiksel olarak anlamlı farklılık saptandı. ORWELL 97-TR toplam puanı ile ise yaş (p=0,007), eğitim durumu (p=0,001), BKİ (p=0,016), son 1 yılda kilo değişimi (p=0,001), diyet (p<0,001) ve egzersiz yapma (p=0,009) arasında anlamlı bir farklılık bulundu.

Sonuç: Bu çalışmada; ölçeklerden alınan puanlara göre katılımcıların yaşam kalitesi orta düzeyde iken, SOY orta-iyi düzeyde bulundu. Ancak SOY arttıkça obez kişilerin yaşam kalitesi sosyal ilişkiler açısından olumsuz etkilenmekte idi. Daha önce diyet ve egzersiz yapanlarda SOY

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Abstract

of obese individuals was negatively affected in terms of social relations. While HL level was higher in those who previously dieted and exercised, weight gain and longer duration of obesity were associated with lower HL. High education level, young age and weight gain negatively affected the quality of life. Our data are important in terms of emphasizing the importance of increasing HL in order for the society and health professionals to effectively manage obesity in the long-term.

Keywords: Health literacy, obesity, ORWELL 97-TR, quality of life, well-being

Öz

düzeyi daha yüksek iken kilo alımı ve uzun obezite süresi daha düşük SOY ile ilişkili idi. Yüksek eğitim düzeyi, genç yaş ve kilo alımı yaşam kalitesini olumsuz yönde etkilemekte idi. Verilerimiz toplumun ve sağlık profesyonellerinin obeziteyi uzun vadede etkili bir şekilde yönetebilmesi hususunda SOY'yi artırmanın önemini vurgulaması açısından önem arz etmektedir.

Anahtar kelimeler: İyi oluş, obezite, ORWELL 97-TR, sağlık okuryazarlığı, yaşam kalitesi

Introduction

Obesity is defined by the World Health Organization as the accumulation of an excess or abnormal amount of fat in the body. More than 1 billion adults are predicted to be obese by 2025 (1,2). In addition to being an important cause of mortality and morbidity, obesity can negatively affect people psychologically, socially and economically, reducing well-being. Awareness of obesity needs to be increased in order to prevent obesity, to treat it when it occurs, and to reduce all the negative consequences it causes (3).

In this context, the concept of health literacy (HL), defined as the ability of individuals to receive basic health information and services, and to understand and process the information they reach, plays a vital role so that they can make appropriate health decisions (4). People with a good HL level are known to adopt behavior that positively affect health, such as healthy eating habits and regular exercise (5). On the contrary, there is new evidence that poor HL is significantly associated with overweight and obesity, might be involved in the etiology of obesity, and could be a critical reason for facing difficulties in overcoming obesity (6).

This study aimed to evaluate the relationship between HL and obesity-related well-being in obese patients admitted to a tertiary hospital and to examine the factors affecting it.

Materials and Methods

This study was planned as a single-center and cross-sectional research. It was performed with 201 participants who were admitted to the family medicine outpatient clinic of a tertiary hospital between April 15 and July 10, 2022. Participants between the ages of 18-65, with a body mass index (BMI) of 30 kg/m^2 and above for the last year, who agreed to participate in the study, could understand and answer the questions asked, and were literate were included in the study. Those under the age of 18 and over the age of 65, those with a BMI of <30 kg/m^2, those with obesity for less than 1 year, those who were pregnant or breastfeeding, those with hearing and speech disorders, those with impaired cognitive functions, those who could not cooperate and those who were illiterate were excluded.

Participants were informed in detail, their verbal and written consents were obtained. All procedures were carried out per the Declaration of Helsinki. The study was performed with the approval of the Local Ethics Committee of University of Health Sciences Turkey, Gaziosmanpaşa Training and Research Hospital (date: March 2, 2022, no: 40). Patient information form, obesity-related well-being questionnaire (ORWELL 97-TR), and health literacy scale-short form (HL-SF) were used to obtain data.

Data Collection Tools

Patient information form

Socio-demographic characteristics (age, gender, marital status, educational status, income status), medical history (presence of chronic disease, drug use), obesity-related features (weight change in the last year, obesity duration, treatment, family history, diet and exercise status, and education on nutrition) were questioned with the patient information form created by the authors.

Obesity definition and grading were evaluated with the formula "BMI=weight (kg)/height (m^2)" based on BMI. According to BMI, 30.00-34.99 kg/m^2 were mildly obese, 35.00-39.99 kg/m^2 were moderately obese, 40.00-49.99 kg/m^2 were morbidly obese, and >50.00 kg/m^2 were super-obese (7).

ORWELL 97-TR

ORWELL 97-TR, developed by Mannucci et al. (8), evaluates the quality of life in obese individuals. It was adapted into Turkish by Usta et al. (9) (Cronbach's alfa=0.906). ORWELL 97-TR consists of 18 items and three sub-dimensions: Psychological aspect, the social relations and sexuality. Each item is scored on a 4-point Likert-type scale,

ranging from 0 to 3 points for the occurrence/severity of symptoms from patients and the subjective relevance of the symptom-related disorder in one's own life. The sum of the "Occurrence" and "Relevance" points gives the total score. A total of 0-90 points can be obtained from ORWELL 97-TR, and an increase in the score indicates a decrease in the quality of life (9).

HL-SF

HL-SF was developed by Duong et al. (10). It was adapted into Turkish by Karahan Yılmaz and Eskici (11). HLS-SF includes 4-point Likert-type response options ranging from 1 (very difficult) to 4 (very easy) and consists of 12 items. The formula [index= (Average-1) x 50/3] is used in its evaluation. The average is calculated by dividing the scale's total score by the number of items on the scale. The index value calculated by the formula ranges from 0-50, and a higher score indicates better HL. The Cronbach's alpha value of the scale is 0.856 (11).

Statistical Analysis

The SPSS 25.0 package program was used for data analysis in the study. Descriptive data on the socio-demographic information of the participants were presented in the form of frequency tables. Pearson correlation analysis, one of the parametric tests, was performed to determine the relationship between the scale and subscale scores. Furthermore, the Independent Samples t-test and ANOVA test, which are parametric tests, were applied to determine whether there was a significant difference between the scale and subscales and the socio-demographic data of the participants. In case of a significant difference between the groups, the LCD test, which is one of the post-hoc tests, was used to determine from which groups the significance originated. A p-value of <0.05 was considered statistically significant.

Results

Ages of 201 participants included in the study ranged from 18 to 65 (mean: 38.78±11.25), and the mean duration of obesity was 8.80±7.13 (min: 2.00-max: 40.00) years. The distribution of socio-demographic, general medical, and obesity-related features is presented in Table 1. The distribution of the scores obtained from the scales and subscales is summarized in Table 2.

Table 3 reveals the correlations between the scores obtained from the scale applied to the participants and the sub-dimensions. A positive and statistically significant correlation was determined between the HLS-SF index score and the "Social Relationships" score, one of the ORWELL TR-97 "Relevance" sub-dimensions (r=0.292 p<0.001) (Table 3).

The comparison of the total and sub-dimension mean scores obtained from the scales according to the socio-demographic characteristics of the participants is presented in Table 4. Accordingly, HLS-SF scores were

Table 1. Socio-demographic and medical characteristics of the participants

Variables		n	%
Age	≤45	138	68.7
	>45	63	31.3
Gender	Female	147	73.1
	Male	54	26.9
Education level	Literate	11	5.5
	Primary school	53	26.4
	Middle school	19	9.5
	High school	49	24.4
	University	69	34.3
Marrital status	Married	135	67.2
	Single	66	32.8
Income status	Low	87	43.3
	Middle	80	39.8
	High	34	16.9
Chronic disease	No	84	41.8
	Yes	117	58.2
Family history of obesity	No	138	68.7
	Yes	63	31.3
Obesity degrees	Mild obese	142	70.6
	Moderate obese	45	22.4
	Morbid obese	12	6.0
	Super obese	2	1.0
Obesity duration	1-5 years	81	40.3
	6-10 years	72	35.8
	≥11 years	48	23.9
Weight change in the last 1 year	Increased	88	43.8
	Decreased	35	17.4
	No change	78	38.8
Diet history	No	79	39.3
	Yes	122	60.7
Obesity treatment	No	176	87.6
	Yes	25	12.4
Exercise history	No	80	39.8
	Yes	121	60.2
Getting education about nutrition	No	159	79.1
	Yes	42	20.9

Data presented as number (%) of participants

higher in patients without chronic disease (p=0.024). A significant difference was observed between the ORWELL 97-TR-total score and age and educational status, and it was determined to be higher in those aged 45 years and younger and with undergraduate degrees (p=0.007 and p=0.001). A significant difference was also found between the ORWELL 97-TR total score and BMI. It was observed to be higher in the "super obese" group compared to other BMI groups (p=0.016) (Table 4).

The comparison of the average scores of the participants from the scales and sub-dimensions according to their obesity characteristics is summarized in Table 5. A statistically significant difference was determined between the HL-SF score and the duration of obesity of the participants. HL-SF scores were higher in those between "1-5 years" compared to other obesity durations (p=0.030). HL-SF scores were higher in those who lost weight in the last year and those who had dieted and exercised before

Table 2. Distribution of scores from scales and subscales

	Min-max	Mean ± SD
HLS-SF score	6-50	32.71±9.93
ORWELL 97-TR-T	11-76	41.22±14.86
ORWELL 97-TR-O	1-37	18.76±8.63
Psychological aspects	1-28	12.76±6.34
Social relations	0-9	3.39±2.12
Sexuality	0-6	2.61±1.56
ORWELL 97-TR-A	7-41	22.46±7.03
Psychological aspects	1-28	13.14±5.90
Social relations	1-9	6.36±1.74
Sexuality	0-6	2.96±1.74

Data presented as mean ± SD and min-max. SD: Standard deviation, HLS-SF: Health literacy scale-short form, ORWELL 97-TR-A: Obesity-related well-being questionnaire relevance, ORWELL 97-TR-O: Obesity-related well-being questionnaire occurrence, ORWELL 97-TR-T: Obesity-related well-being questionnaire total

Table 3. Correlation results of scale and sub-dimensional relations

		1	2	3	4	5	6	7	8	9	10
1-HLS-SF score	r	1									
	p										
2- ORWELL 97-TR-T score	r	-0.033	1								
	p	0.639									
3- ORWELL 97-TR-O score	r	-0.048	0.958**	1							
	p	0.503	**<0.001**								
4- O-Psychological aspects	r	-0.021	0.910**	0.960**	1						
	p	0.772	**<0.001**	**<0.001**							
5- O-Social relations	r	-0.114	0.713**	0.759**	0.597**	1					
	p	0.106	**<0.001**	**<0.001**	**<0.001**						
6- O-Sexuality	r	-0.024	0.635**	0.602**	0.434**	0.418**	1				
	p	0.735	**<0.001**	**<0.001**	**<0.001**	**<0.001**					
7- ORWELL 97-TR-A score	r	-0.012	0.936**	0.797**	0.745**	0.574**	0.602**	1			
	p	0.866	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**				
8- A-Psychological aspects	r	-0.097	0.919**	0.824**	0.808**	0.594**	0.470**	0.929**	1		
	p	0.172	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**			
9- A-Social relations	r	0.292**	0.188**	0.019	-0.031	0.047	0.170*	0.374**	0.097	1	
	p	**<0.001**	**0.007**	0.786	0.662	0.511	**0,016**	**<0.001**	0.169		
10- A-Sexuality	r	-0.012	0.480**	0.405**	0.301**	0.259**	0.667**	0.517**	0.267**	0.182**	1
	p	0.870	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	**<0.001**	

Pearson correlation analysis *p<0.05. HLS: Health literacy scale-short form, ORWELL 97-TR-A: Obesity-related well-being questionnaire relevance, ORWELL 97-TR-O: Obesity-related well-being questionnaire occurrence, ORWELL 97-TR-T: Obesity-related well-being questionnaire total

(p=0.048; p=0.048; p<0.001, respectively). ORWELL TR-97 total score was statistically significantly higher in those with weight gain in the last year and those who dieted and exercised before (p=0.001; p<0.001; p=0.009, respectively) (Table 5).

Discussion

In this study, which aimed to evaluate the relationship between HL and obesity-related well-being in obese adults and to examine the affecting factors, based on the scale scores, the quality of life of the participants was moderate, while the HL levels were moderate-good. However, it was observed that the social relations of obese people were negatively affected as the HL level increased. HL was higher, but the quality of life was lower in those who dieted and exercised before. While HL was higher in patients without chronic disease, who lost weight in the last year and had a short period of obesity, high education level, young age, and weight gain negatively affected their quality of life.

Table 4. Evaluation of scales' total and sub-dimension scores according to socio-demographic and clinical features of the participants

	HLS-SF	ORWELL 97-TR-T	ORWELL 97-TR-O	O-Psychological aspects	O-Social relations	O-Sexuality	ORWELL 97-TR-A	A-Psychological aspects	A-Social relations	A-Sexuality
Age	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**
≤45	31.95±9.69	43.12±14.94	19.91±8.56	13.80±6.25	3.43±2.08	2.69±1.47	23.20±7.22	14.04±5.84	6.18±1.67	2.98±1.64
>45	34.37±10.32	37.06±13.89	16.22±8.31	10.48±5.98	3.32±2.22	2.43±1.72	20.84±6.35	11.17±5.57	6.76±1.82	2.90±1.97
p=	0.110	**0.007**	**0.005**	**<0.001**	0.734	0.273	**0.027**	**0.001**	**0.027**	0.796
Gender	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**
Female	32.73±9.90	41.56±14.73	18.82±8.49	12.96±6.24	3.22±2.08	2.65±1.59	22.74±7.16	13.70±5.80	6.29±1.73	2.76±1.71
Male	32.66±10.11	40.28±15.29	18.57±9.10	12.20±6.65	3.87±2.19	2.50±1.46	21.70±6.68	11.63±5.96	6.57±1.75	3.50±1.72
p=	0.968	0.587	0.857	0.456	**0.053**	0.556	0.355	**0.027**	0.298	**0.007**
Education status	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**
1) Literate	27.90±18.29	28.36±10.03	11.45±5.99	8.64±4.99	1.55±1.75	1.27±1.35	16.91±4.50	9.27±4.36	5.55±1.29	2.09±1.70
2) Primary sch.	33.36±9.88	37.32±14.26	15.47±7.95	10.21±6.42	3.00±1.93	2.26±1.61	21.85±7.34	12.19±6.29	6.89±1.92	2.77±1.84
3) Middle sch.	29.97±7.6	40.95±14.57	19.89±8.96	13.53±6.27	3.95±2.04	2.42±1.50	21.05±6.02	13.00±5.74	5.42±1.68	2.63±1.46
4) Hisg sch.	31.32±9.10	42.00±14.93	19.45±8.01	13.22±5.41	3.24±2.19	2.98±155	22.55±7.31	13.14±5.73	6.49±1.70	2.92±1.86
5) University	34.72±8.99	45.78±14.33	21.64±8.53	14.83±6.30	3.94±2.09	2.87±1.42	24.14±6.72	14.54±5.68	6.26±1.56	3.35±1.61
p=	0.089	**0.001**	**<0.001**	**<0.001**	**0.002**	**0.003**	**0.016**	**0.039**	**0.009**	0.112
Post-hoc tests=	-	1-3,4,5 2-5	1-3,4,5 2-3,4,5	1-3,4,5 2-3,4,5	1-2,3,4,5 2-5	1-2,3,4,5 2-4,5	1-2,4,5	1-4,5 2-5	1-2 2-3,5 3-4	-
Marrital status	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**
Maried	32.83±10.28	41.02±15.43	18.10±8.96	12.26±6.51	3.26±2.12	2.59±1.68	22.92±7.17	13.25±5.91	6.65±1.59	3.01±1.77
Single	32.47±9.25	41.62±13.71	20.09±7.82	13.77±5.90	3.67±2.11	2.65±1.27	21.53±6.70	12.92±5.93	5.77±1.87	2.83±1.68
p=	0.811	0.789	0.126	0.112	0.202	0.756	0.189	0.713	**0.001**	0.489
Income status	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**
1) Low	31.98±11.16	38.62±13.21	17.39±7.58	11.84±5.63	3.11±1.85	2.44±1.60	21.23±6.57	12.54±5.37	6.10±1.85	2.59±1.71
2) Middle	32.85±7.94	42,20±16.06	19.24±9.41	13.23±7.17	3.39±2.15	2.63±1.57	22.96±7.27	13.49±6.20	6.46±1.62	3.01±1.70
3) High	34.27±10.86	45.56±15.01	21.12±8.88	14.00±5.82	4.12±2.56	3.00±1.37	24.44±7.22	13.88±6.48	6.79±1.63	3.76±1.69
p=	0.516	0.051	0.083	0.169	0.064	0.200	0.055	0.426	0.116	**0.003**
Chronic disease	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**
No	34.47±7.77	40.23±15.31	18.52±8.91	12.37±6.56	3.43±2.04	2.73±1.52	21.70±7.33	12.42±6.20	6.33±1.79	2.95±1.68
Yes	31.45±11.09	41.93±14.55	18.92±8.46	13.03±6.19	3.37±2.18	2.52±1.58	23.01±6.79	13.67±5.65	6.38±1.70	2.96±1.79
p=	**0.024**	0.424	0.747	0.465	0.841	0.358	0.195	0.139	0.837	0.984

Independent t-test, ANOVA test, post-hoc; LSD test. HLS-SF: health literacy scale-short form, ORWELL 97-TR-A: Obesity-related well-being questionnaire relevance, ORWELL 97-TR-O: Obesity-related well-being questionnaire occurrence, ORWELL 97-TR-T: Obesity-related well-being questionnaire total, SD: Standard deviation

Main findings on obesity-related well-being and HL

Many studies observed that obesity reduces the quality of life by negatively affecting many areas of people's lives (3). In a study by Marchitelli et al. (12) with 45 patients who had planned to have bariatric surgery, the total score of ORWELL-97 was 42.02±20.24, and the quality of life of people with a higher BMI was lower. Wooldridge et al. (13) examined the relationship between eating disorders and quality of life in people with a BMI >25, ORWELL-97 total score was found 49.58±29.20, and BMI was reported to be associated with a higher ORWELL score. In another study the ORWELL-97 total score was 46.38±27.07 and, although there was no relationship between the decrease in BMI and the occurrence score, a relationship was determined with the relevance score (14). In our study, the quality of life of the individuals was evaluated as moderate, and as the degree of obesity increased, the effect of obesity increased. The number of studies conducted with the Turkish form of ORWELL in the literature is limited, and the results we obtained were found to be similar to other forms of the scale.

Table 5. Evaluation of scales' total and sub-dimension scores according to obesity characteristics of the participants

Variables	HLS-SF	ORWELL 97-TR-T	ORWELL 97-TR-O	O-Psychological aspects	O-Social relations	O-Sexuality	ORWELL 97-TR -A	A-Psychological aspects	A-Social relations	A-Sexuality
Obesity degrees	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**
1) Mild	33.39±10.12	40.19±14.65	17.96±8.64	12.32±6.41	3.11±2.16	2.53±1.51	22.23±6.70	12.73±5.59	6.59±1.64	2.91±1.80
2) Moderate	31.82±9.82	46.31±14.96	22.18±8.31	14.89±5.80	4.29±1.85	3.00±1.75	24.13±7.56	15.16±6.11	5.93±1.98	3.04±1.68
3) Morbid	28.70±8.08	33.00±12.78	15.67±7.39	10.25±6.45	3.42±2.02	2.00±1.13	17.33±6.12	9.33±6.30	5.17±1.27	2.83±1.19
4) Super	28.47±0.98	49.00±0.00	17.00±0.00	11.00±0.00	3.00±0.00	3.00±0.00	32.00±0.00	20.00±0.00	7.00±0.00	5.00±0.00
p=	0.343	**0.016**	**0.018**	**0.049**	**0.013**	0.158	**0.005**	**0.003**	**0.010**	0.388
Post-hoc test=	-	1-2, 2-3	1-2, 2-3	1-2, 2-3	1-2	-	1-3,4 2-3, 3-4	1-2,3 2-3, 3-4	1-2,3	-
Obesity duration	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**
1) 1-5 years	34.88±9.02	43.09±15.48	19.88±9.00	13.72±6.53	3.25±2.21	2.91±1.46	23.21±7.01	13.51±5.71	6.62±1.45	3.09±1.71
2) 6-10 years	30.73±10.42	41.93±14.89	18.88±8.56	12.89±6.46	3.53±2.16	2.46±1.64	23.06±7.16	13.71±6.27	6.35±1.65	3.00±1.85
3) ≥11 years	32.03±10.12	37.00±13.09	16.69±7.87	10.94±5.53	3.44±1.93	2.31±1.53	20.31±6.56	11.69±5.51	5.96±2.19	2.67±1.62
p=	**0.030**	0.069	0.126	0.053	0.708	0.062	0.051	0.143	0.113	0.404
Post-hoc tests=	1-2	-	-	-	-	-	-	-	-	-
Weight change	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**
1) Increased	32.75±9.08	45.59±13.82	21.42±7.90	14.66±5.67	3.69±2.04	3.07±1.34	24.17±6.84	14.72±5.27	6.28±1.69	3.17±1.70
2) Decreased	36.11±9.61	39.23±14.37	17.14±8.50	11.43±7.52	3.46±1.87	2.26±1.44	22.09±7.37	12.31±6.66	7.03±1.92	2.74±1.90
3) No change	31.14±10.69	37.18±15.04	16.47±8.75	11.21±5.98	3.03±2.28	2.24±1.71	20.71±6.71	11.74±5.86	6.15±1.64	2.81±1.71
p=	**0.048**	**0.001**	**<0.001**	**0.001**	0.126	**0.001**	**0.006**	**0.003**	**0.039**	0.299
Post-hoc tests=	2-3	1-2,3	1-2,3	1-2,3	-	1-2,3	1-3	1-2,3	1-2, 2-3	-
Diet history	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**
No	31.00±9.86	35.67±13.48	15.67±7.83	10.94±6.18	2.71±1.95	2.03±1.48	20.00±6.52	11.37±5.88	6.20±1.64	2.43±1.68
Yes	33.82±9.85	44.81±14.65	20.75±8.57	13.93±6.19	3.84±2.12	2.98±1.49	24.06±6.91	14.30±5.65	6.47±1.80	3.30±1.70
p=	**0.048**	**<0.001**	**<0.001**	**0.001**	**<0.001**	**<0.001**	**<0.001**	**0.001**	0.292	**0.001**
Obesity treatment	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**
No	32.57±9.73	40.75±15.15	18.45±8.81	12.60±6.50	3.35±2.14	2.50±1.56	22.30±7.18	13.02±6.05	6.38±1.71	2.90±1.72
Yes	33.72±11.42	44.52±12.32	20.92±7.04	13.88±5.04	3.68±2.04	3.36±1.35	23.60±5.91	14.00±4.71	6.24±1.96	3.36±1.87
p=	0.588	0.236	0.181	0.345	0.471	**0.009**	0.389	0.440	0.706	0.215
Exercise history	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**
No	29.44±9.96	37.86±14.53	17.43±8.31	12.08±6.34	3.04±2.11	2.31±1.63	20.44±6.90	12.03±5.81	5.83±1.82	2.59±1.60
Yes	34.87±9.34	43.44±14.71	19.64±8.76	13.21±6.33	3.63±2.11	2.80±1.48	23.80±6.82	13.88±5.87	6.72±1.59	3.20±1.79
p=	**<0.001**	**0.009**	0.075	0.217	0.053	**0.029**	**0.001**	**0.028**	**<0.001**	**0.015**
Post-hoc tests=	**1-2,3** **2-3**	**2-3**	**1-2** **2-3**	**1-2** **2-3**	-	-	**2-3**	-	**1-2,3**	-

Independent t-test, ANOVA test, post-hoc; LSD Test HLS-SF: Health literacy scale-short form, ORWELL 97-TR-A: Obesity-related well-being questionnaire relevance, ORWELL 97-TR-O: Obesity-related well-being questionnaire occurrence, ORWELL 97-TR-T: Obesity-related well-being questionnaire total, SD: Standard deviation

In general, it is seen that people with high BMI have low HL (5,6,15,16). In fact, as the degree of obesity increases, it has been observed that HL decreases even more (17). However, some studies detected no relationship between HL and body weight (18). In our study, the HL level was evaluated as moderate-good. Although the HL level was higher in our study compared to the literature, there was no significant difference in the degree of obesity. This situation may be due to the differences in socio-cultural distributions, as well as supporting that different results can be obtained with different measurement tools.

The quality of life is known to be better in people with high HL levels (19-21). Although no significant relationship was determined between the level of HL and quality of life in obese individuals in our study, social relations, a crucial sub-factor of quality of life, were negatively affected as the level of HL increased.

Factors affecting obesity-related well-being

Studies have shown that increasing age negatively affects the quality of life. In the study of Yıldız and Çetinkaya (22), a lower quality of life was found between the ages of 50-65. On the contrary, Itani et al. (23) was not found any relation of age and well-being. In our study, the quality of life of those aged 45 years and younger was lower. It is thought that this may be since obese individuals at younger ages are more affected by the negative effects of obesity, especially on psychological symptoms and severity.

As in the general population, studies have reported that the quality of life is low in women with obesity (24,25). The increase in BMI in obese patients was associated with an increase in ORWELL-97 scores and, therefore, a decrease in quality of life in obese patients by Itani et al. (23). However, this relationship was observed only in women and not significant in men. In the study by Tambelli et al. (26), no difference was determined between men and women regarding the quality of life. In our study, although there was no significant difference between the genders in terms of quality of life, partially similar to the study of Itani et al. (23), the quality of life in women was more affected due to the higher incidence of psychological symptoms.

The quality of life was generally lower in people with low education (24). In our study, well-being was negatively affected in obese patients with a higher education level, similar to the literature.

It is known that, an increase in physical activity increases the quality of life (27). However, in our study, obesity-related quality of life was lower in those who exercised. It is considered that individuals who exercise and follow the exercise plan have higher awareness; thus, they may perceive the adverse effects of obesity on their quality of life more.

Factors affecting HL

In a study in 2022, HL level was high in young people, especially in the 16-34 age group (28). While Cheong et al. (29) was found HL higher in middle-aged adults, Toçi et al. (17) found it lower. In our study, unlike the literature, there was no statistically significant difference between HL level and age. Age may not be an effective factor in HL alone, the people may need to be evaluated together with other characteristics.

Studies evaluating the HL determined that the HL level increases as the education level increases (28,30,31). Although no statistically significant difference was found in our study, similar to the literature, those with higher education levels had higher HL scores. As the level of education increases, people can better access and understand the information they are curious about their health.

Individuals with sufficient HL levels were observed to adopt behaviors that positively affect health, such as healthy eating habits and regular exercise (5). In our study, similarly, the HL level was higher in those who lost weight and those who dieted and exercised before. By informing obese people with high HL levels about nutrition or directing them to a nutritionist, it can contribute to a more efficient weight loss process.

Study Limitations

The limitation of our study is that it did not examine the changes in the quality of life of individuals according to the course of obesity. Contribution to the literature can be achieved with different studies in which obese people are followed for a long time, and their changes in their quality of life are monitored.

Conclusion

According to our study the quality of life of obese adults was moderate, and HL levels were moderate-good. Moreover, it was observed that the social relations of obese individuals were negatively affected as the HL

level increased. While HL was higher in patients without chronic disease, who lost weight in the last year and had a short period of obesity, high education level, young age, and weight gain negatively affected their quality of life. Increasing the HL is essential in enabling society and health professionals to manage obesity effectively in the long-term.

Ethics

Ethics Committee Approval: The study was performed with the approval of the Local Ethics Committee of University of Health Sciences Turkey, Gaziosmanpaşa Training and Research Hospital (date: March 2, 2022, no: 40).

Informed Consent: Written informed consent was obtained from all participants.

Peer-review: Internally peer-reviwed.

Authorship Contributions

Concept: Ş.A.C., S.T.K., O.B., Design: Ş.A.C., S.T.K., O.B., Data Collection or Processing: Ş.A.C., S.T.K., O.B., Analysis or Interpretation: Ş.A.C., S.T.K., O.B., Drafting Manuscript: Ş.A.C., S.T.K., O.B., Critical Revision of Manuscript: Ş.A.C., S.T.K., O.B., Final Approval and Accountability: Ş.A.C., S.T.K., O.B., Writing: Ş.A.C., S.T.K., O.B.

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