ORIGINAL ARTICLE

DOI: 10.4274/eamr.galenos.2024.93823
Eur Arch Med Res 2024;40(1):19-24

Exploring the Relationship Between Obesity and Social Anxiety Disorder: A Cross-sectional Study on Quality of Life Impacts in Adults Aged 18-45

Tuğba Çakmak[1], Güzin Zeren Öztürk[2], Saliha Büşra Aksu[2]

[1]*Bahçelievler State Hospital, Clinic of Family Medicine, İstanbul, Turkey*
[2]*University of Health Sciences Turkey, Şişli Hamidiye Etfal Training and Research Hospital, Clinic of Family Medicine, İstanbul, Turkey*

Abstract

Objective: Obesity and social anxiety disorders (SADs) are prevalent conditions that significantly impact individuals' quality of life. Understanding the relationship between these conditions is crucial for effective healthcare interventions. This study aimed to investigate the presence of SADs among obese and non-obese individuals aged 18-45 years and assess their impact on quality of life.

Methods: Participants were evaluated using a sociodemographic information form and the Liebowitz social anxiety scale (LSAS). Measurements of height, body mass, hip circumference (HC), and waist circumference (WC) were also performed to assess obesity status.

Results: Analysis revealed that as body mass index increased, LSAS scores significantly increased (p=0.008, r=0.223), indicating a strong correlation between obesity and social anxiety levels. Among the obese and non-obese groups, obese participants showed a significantly higher likelihood of having SAD [Liebowitz social anxiety disorder (LSAD)] (p=0.026). This trend was particularly pronounced among women; obese females had significantly higher LSAD scores than non-obese females (p=0.023). Furthermore, LSAD scores significantly increased with waist and HCs (p=0.018, p=0.031, respectively), with a notable gender difference where increased WC was associated with higher LSAD scores in women (p=0.035).

Conclusion: The findings underscore the importance of psychological support in obesity treatment and advocate for comprehensive psychiatric evaluations for all patients. Addressing gender-specific challenges through targeted interventions could improve overall mental and physical health outcomes. Incorporating psychological support is vital for achieving sustained weight loss and enhancing quality of life.

This study highlights the integral role of mental health support in treating obesity, emphasizing the need for gender-specific approaches to address the intertwined issues of obesity and social anxiety. A multidisciplinary strategy that includes psychological care is essential for effective treatment and long-term success.

Keywords: Obesity, social anxiety disorder, waist-to-hip ratio, waist circumference, hip circumference

INTRODUCTION

Obesity is defined as excessive or abnormal fat accumulation that jeopardizes health, embodying a complex condition with multifactorial origins. The World Health Organization (WHO) classifies an adult with a body mass index (BMI) of 25 or higher as overweight and 30 or above as obese. Globally, 39% of adults were overweight or obese in 2016, a figure that rose to 66.8% within our nation (1,2). Data from the Turkish Statistical Institute in 2022 highlighted a higher prevalence of obesity among women (23.6%) than among men (16.8%) in Turkey (3).

The epidemic of overweight and obesity is acknowledged as a chronic disease, significantly contributing to the global surge in

Address for Correspondence: Saliha Büşra Aksu, University of Health Sciences Turkey, Şişli Hamidiye Etfal Training and Research Hospital, Clinic of Family Medicine, İstanbul, Turkey
Phone: +90 537 693 29 33 **E-mail:** drsalihabusra@gmail.com **ORCID ID:** orcid.org/0000-0003-0432-6801

Received: 09.11.2023
Accepted: 21.02.2024

Cite this article as: Çakmak T, Öztürk GZ, Aksu SB. Exploring the Relationship Between Obesity and Social Anxiety Disorder: A Cross-sectional Study on Quality of Life Impacts in Adults Aged 18-45. Eur Arch Med Res 2024;40(1):19-24

chronic, non-communicable diseases (4). Obesity is implicated in at least 13 types of cancer and is associated with numerous conditions affecting various body systems. Its adverse health consequences stem from mechanical, metabolic, and mental health issues, including musculoskeletal disorders, increased cardiovascular risk, type 2 diabetes, and psychological effects such as depression and low self-esteem due to societal stigma (2,4,5).

Social anxiety disorder (SAD), or social phobia, is characterized by intense, persistent fear or anxiety in social settings (6). Those afflicted experience severe discomfort and avoidance of situations where they might be judged or scrutinized, which impacts personal, academic, and professional life, leading to isolation and diminished quality of life (7).

The confluence of obesity and social phobia markedly diminishes individuals' well-being and quality of life. The bidirectional influence where SAD potentially alters eating behaviors, and conversely, where eating habits may signal the presence of SAD, underscores the complexity of these conditions (8).

This study was designed to explore the intricate relationship between obesity and social phobia, specifically investigating the presence and impact of social phobias on the quality of life among obese and non-obese individuals aged 18-45 years. Our aim is to shed light on these interactions to enhance healthcare delivery, raise awareness, and alleviate the stigma associated with these prevalent conditions.

METHODS

Research Setting and Participants

This descriptive study was conducted at University of Health Sciences Turkey, Şişli Hamidiye Etfal Training and Research Hospital, focusing on a single-center approach. We included 140 individuals aged 18-45 years who sought care at family medicine outpatient clinics for various reasons from November 15, 2022, to January 16, 2023. The participant count was determined on the basis of a 95% confidence level from 443 visits by this age demographic in the preceding three months to our clinic. The exclusion criteria were any psychiatric diagnoses, communication impediments, or refusal to participate in the research.

Data Collection Instruments

Data were gathered using a sociodemographic questionnaire developed by the researchers alongside the Liebowitz social anxiety scale (LSAS) through direct interviews after obtaining the consent of the participants. Measurements of height, body weight, hip circumference (HC), and waist circumference (WC) were conducted with precision up to 0.1 kg for weight and 0.1 cm for height and circumference, using standardized methods and equipment (9). Obesity was classified according to BMI based on WHO standards (1). WC and HC measurements were taken with a flexible, non-stretch tape measure to the nearest 0.1 cm, under minimal clothing conditions, with the WC measured midway between the lower rib and the iliac crest, and HC at the buttocks' widest point. Waist-hip ratios (WHR) calculations followed WHO guidelines, categorizing ≥0.90 cm in men and ≥0.85 cm in women as elevated (10).

Liebowitz Social Anxiety Scale

The LSAS, introduced by Michael Liebowitz in 1987, is an extensively validated instrument for quantifying the severity of SAD symptoms (11). This 24-item questionnaire evaluates fear and avoidance of social situations over the previous week, including 13 items on public performance and 11 on social interaction. Each item is rated on a 4-point Likert scale for fear (0-3) and avoidance (0-3), with subscale scores derived from the sum of these ratings. The Turkish adaptation of LSAS by Dilbaz (12) has confirmed its reliability. A threshold score of 30 was identified to optimally discriminate between individuals with and without SAD, offering high sensitivity and specificity (13). Consequently, our analysis considered scores of 30 or higher on the LSAS as indicative of potential SAD.

Statistical Analysis

IBM SPSS version 25.0 (SPSS Inc., Chicago, Illinois, USA) was used for all statistical analyses. Continuous data are presented as mean ± standard deviation, whereas categorical data are displayed as frequency (N) and percentage (%). The independent samples t-test and one-way ANOVA were used to assess differences across two or more groups regarding scale scores and other participant data. Student's t-test and Mann-Whitney U test were applied based on the normality of data distribution. Chi-squared tests examined the variation in categorical data across groups, with the Sidak test pinpointing significant differences when they arose. A p-value of ≤0.05 was considered statistically significant.

The study received approval from the Clinical Research Ethics Committee of University of Health Sciences Turkey, Şişli Hamidiye Etfal Training and Research Hospital (approval number: 3724, date: 15.11.2022).

RESULTS

The analysis encompassed 140 participants aged between 18 and 45 years, with a mean age of 32.27±7.90 years. Of these, 94 (67.1%) were female. Detailed sociodemographic characteristics and family obesity history are presented in Table 1.

Of the participants, 69 (49.3%) were classified as obese. Heights averaged 167.77±8.45 cm (range: 150-190 cm), while weights were on average 79.82±18.55 kg (range: 46-130 kg). The mean waist and HCs measured were 91.82±14.27 cm (range: 62-132 cm) and 110.27±11.87 cm (range: 90-143 cm), respectively.

A comparative analysis of sociodemographic data against obesity status revealed significant findings, as detailed in Table 2. Notably, individuals without a family history of obesity showed a higher tendency to be non-obese (p=0.000).

Within the cohort, 104 participants (74.3%) were identified with Liebowitz social anxiety disorder (LSAD), comprising 71 females (75.5%) and 33 males (71.7%). The distribution of LSAD across various BMI categories is depicted in Graphic 1.

Table 1. Sociodemographic data and family history of obesity of the participants

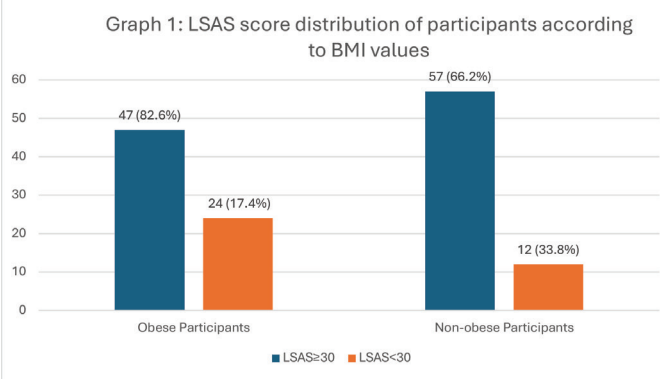
Variables		n	%
Gender	Female	94	67.1
	Male	46	32.9
Marital status	Married	80	57.1
	Not married	60	42.9
Educational status	Below high school	40	28.6
	High school and above	100	71.4
Employment status	Employed	84	60.0
	Unemployed	56	40.0
Income status	Low	71	50.7
	Medium	36	25.7
	High	33	23.6
Is there anyone in your family diagnosed with obesity?	Yes	30	21.4
	No	110	78.6

Table 2. Comparison of sociodemographic data and obesity status of participants

Demographic variables	Non-obese n (%)	Obese n (%)	p-value
Gender			
Female	46 (48.9%)	48 (51.1%)	0.547
Male	25 (54.3%)	21 (45.7%)	
Marital status			
Married	37 (46.3%)	43 (53.8%)	0.222
Not married	34 (56.7%)	26 (43.3%)	
Educational status			
Below high school	18 (45.0%)	22 (55.0%)	0.392
High school and above	53 (53.0%)	47 (47.0%)	
Employment status			
Employed	43 (51.2%)	41 (48.8%)	0.890
Unemployed	28 (50.0%)	28 (50.0%)	
Income status			
Low	36 (50.7%)	35 (49.3%)	0.992
Medium	18 (50.0%)	18 (50.0%)	
High	17 (50.7%)	16 (49.3%)	
Is there anyone in your family diagnosed with obesity?			
Yes	5 (16.7%)	25 (83.3%)	0.000
No	66 (60.0%)	44 (40.0%)	

An investigation into the correlation between BMI values and LSAS scores indicated a significant increase in LSAS scores parallel to an increase in BMI (p=0.008, r=0.223). Furthermore, when subjects were categorized into obese and non-obese groups, LSAS scores were significantly higher in obese individuals (p=0.026). A gender-specific analysis revealed this difference to be significant only among females, with obese women exhibiting higher LSAS scores than their non-obese counterparts (p=0.023). When regression analysis was performed according to whether the subjects were obese or not, no significant results were found with gender, SAD, and WHR (R^2=0.068).

Examining the relationship between waist and HCs and LSAS scores (Table 3) revealed a significant correlation; higher waist and HCs were associated with increased LSAS scores (p=0.018 and p=0.031, respectively). Focusing on gender disparities, an increase in WC significantly affected LSAS scores among women (p=0.035).



Graphic 1. LSAS score distribution of participants according to BMI values
LSAS: Liebowitz social anxiety scale, BMI: Body mass index

Additionally, participants with elevated WHR demonstrated higher LSAS scores (p=0.007), a trend particularly pronounced in women, where those with increased WHR showed significantly higher LSAS scores (p=0.031).

DISCUSSION

Our research aimed to illuminate the complex interplay between obesity and social anxiety by assessing participants using the LSAS and examining the correlation between obesity and SAD. Apart from the family history of obesity, sociodemographic comparisons between the obese and non-obese groups revealed no significant differences (2,4). Obesity emerges as a multifactorial condition, shaped by a blend of genetic, environmental, and lifestyle factors, with adult obesity often tracing back to familial and childhood instances, underscoring the role of inherited and environmental influences (14,15).

Moreover, obesity's ramifications extend beyond metabolic disorders such as diabetes and cardiovascular diseases to encompass mental health issues, including various anxiety disorders and depressive states (16,17). The link between obesity and anxiety disorders, particularly SAD, might stem from obesity-induced body image dissatisfaction, societal stigma, and lowered self-esteem, making obese individuals more susceptible to anxiety disorders than their non-obese counterparts (18,19). Discrimination and reduced social support further intensify the psychological distress of obese individuals, limiting their social and psychological resources (20-22).

Remarkably, our study found a 74.3% prevalence of SAD, which is significantly higher than the general population's estimated lifetime prevalence of 13% (23) and previous findings in obese

Table 3. Relationship between waist circumference and hip circumference and LSAS scores of participants

			LSAS score <30	LSAS score ≥30	p-value
			Mean ± SD	Mean ± SD	
Waist circumference			87.69±13.89	107.11±11.56	0.018
Hip circumference			93.25±14.18	111.36±11.84	0.031
Waist circumference	Female		84.47±14.54	90.47±13.46	0.035
	Male		93.38±10.98	99.24±14.03	0.187
Hip circumference	Female		107.30±12.57	111.49±11.45	0.080
	Male		106.76±10.00	111.09±12.81	0.322
			n (%)	n (%)	
Waist circumference / hip circumference	Female	Normal	28 (65.1%)	15 (34.9%)	0.031
		Increased	43 (84.3%)	8 (15.7%)	
	Male	Normal	20 (64.5%)	11 (35.5%)	0.118
		Increased	13 (86.7%)	2 (13.3%)	

LSAS: Liebowitz social anxiety scale, SD: Standard deviation

populations (24,25). This heightened prevalence could be attributed to the post-pandemic context, aligning with studies indicating an increase in social anxiety incidences during and after the pandemic (26,27).

A pivotal discovery was the disproportionate impact of obesity on social anxiety based on gender, with women bearing a greater burden. This disparity likely arises from societal and cultural norms that impose stricter body image standards on women than on men, contributing to increased anxiety and body dissatisfaction among women (28). Studies corroborate this finding, showing a higher prevalence of severe anxiety among obese women compared with their non-obese counterparts (29), and a significant relationship between increased WHRs and social anxiety in women, a pattern not observed in men, indicating that females are more frequently exposed to idealized body images in daily life (30,31).

Pathophysiological explanations for these findings may include hormonal imbalances in obese women that affect mood-regulating neurotransmitters, thereby influencing anxiety levels (32). The societal preference for certain body shapes intensifies body image concerns, potentially leading to behaviors that further entrench obesity (33,34). While societal pressures are undeniable, not everyone is equally affected.

Research on gender differences in body appreciation shows that women are more likely to engage in harmful social comparisons, worsening body dissatisfaction and its psychological effects (35-37). Addressing obesity thus necessitates a holistic approach that includes psychiatric evaluation, acknowledging the interconnection between obesity and mental health (16,17). Although it is important to note that not everyone with social anxiety will be obese, and vise versa, social anxiety and obesity can influence each other through various behavioral, psychological, and social factors. Social anxiety can cause isolation, which may lead to emotional eating, lack of exercise, and low self-esteem (38). Bariatric surgery, despite its effectiveness in weight management, highlights the complex nature of obesity treatment, emphasizing the importance of considering pre-operative factors, eating behaviors, and mental health (39,40).

CONCLUSION

Integration of psychological support is crucial in obesity treatment, underscoring the need for comprehensive psychiatric evaluations before and during treatment. Addressing the psychological aspects of obesity enhances the effectiveness of medical and dietary interventions. Furthermore, recognizing gender-specific challenges can improve both mental and physical health outcomes, advocating for interventions tailored to address these unique needs. Ultimately, a multidisciplinary approach, including psychological support, is pivotal for achieving sustainable weight management.

Further randomized controlled trials are necessary to confirm these findings and deepen our understanding of the intricate relationship between obesity, social anxiety, and gender.

Ethics

Ethics Committee Approval: The study received approval from the Clinical Research Ethics Committee of University of Health Sciences Turkey, Şişli Hamidiye Etfal Training and Research Hospital (approval number: 3724, date: 15.11.2022).

Informed Consent: Informed written consent was obtained from all participants.

Authorship Contributions

Concept: T.Ç., G.Z.Ö., Design: T.Ç., G.Z.Ö., Data Collection or Processing: T.Ç., G.Z.Ö., Analysis or Interpretation: T.Ç., G.Z.Ö., S.B.A., Literature Search: T.Ç., G.Z.Ö., S.B.A., Writing: G.Z.Ö., S.B.A.

Conflict of Interest: No conflicts of interest were declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

REFERENCES

1. World Health Organization. Obesity and Overweight [Internet]. 2023 [cited 2023 Oct 23]. Available from: https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight
2. World Health Organization. WHO European Regional Obesity Report 2022 [Internet]. Copenhagen; 2022 [cited 2023 Oct 23]. Available from: https://iris.who.int/bitstream/handle/10665/353747/9789289057738-eng.pdf?sequence=1
3. Turkey Statistical Institute. Turkey Health Survey,2022 [Internet]. 2023 [cited 2023 Oct 23]. Available from: https://data.tuik.gov.tr/Bulten/Index?p=Turkiye-Saglik-Arastirmasi-2022-49747
4. World Obesity Federation. World Obesity Atlas 2022 [Internet]. 3; 2022 [cited 2023 Oct 23]. Available from: https://s3-eu-west-1.amazonaws.com/wof-files/World_Obesity_Atlas_2022.pdf
5. Rubino F, Puhl RM, Cummings DE, Eckel RH, Ryan DH, Mechanick JI, et al. Joint international consensus statement for ending stigma of obesity. Nat Med 2020;4;26:485-97.
6. Rapee RM. Descriptive psychopathology of social phobia.The Guilford Press 1995:41-66.
7. Jefferson JW. Social Anxiety Disorder: More Than Just a Little Shyness. Prim Care Companion J Clin Psychiatry 2001;3:4-9.
8. Cifuentes L, Campos A, Silgado MLR, Kelpin S, Stutzman J, Hurtado MD, et al. Association between anxiety and eating behaviors in patients with obesity. Obesity Pillars 2022;3:100021.

9. National Center for Health Statistics Centers for Disease Control and Prevention. The Third National Health and Nutrition Examination Survey Reference Manuals and Reports [Internet]. 1996 [cited 2023 Oct 23]. Available from: https://www.cdc.gov/nchs/data/nhanes/nhanes3/cdrom/main.pdf
10. World Health Organization. Waist circumference and waist-hip ratio. Report of a WHO Expert Consultation [Internet]. Geneva; 2008 Dec [cited 2023 Oct 23]. Available from: https://iris.who.int/bitstream/handle/10665/44583/9789241501491_eng.pdf?sequence=1
11. Liebowitz MR. Social phobia. Mod Probl Pharmacopsychiatry. 1987;22:141-73.
12. Dilbaz N. Liebowitz sosyal kaygı ölçeğinin geçerlik ve güvenirliği. İstanbul 2001. Available from: https://toad.halileksi.net/wp-content/uploads/2022/07/liebowitz-sosyal-kaygi-olcegi-liebowitz-social-anxiety-scale-the-turkish-version-toad.pdf
13. Mennin DS, Fresco DM, Heimberg RG, Schneier FR, Davies SO, Liebowitz MR. Screening for social anxiety disorder in the clinical setting: using the Liebowitz Social Anxiety Scale. J Anxiety Disord 2002;16:661-73.
14. Kral TVE, Rauh EM. Eating behaviors of children in the context of their family environment. Physiol Behav 2010;100:567-73.
15. https://pubmed.ncbi.nlm.nih.gov/25905211/
16. Amin T, Mercer JG. Hunger and Satiety Mechanisms and Their Potential Exploitation in the Regulation of Food Intake. Curr Obes Rep 2016;14;5:106-12.
17. Simon GE, Von Korff M, Saunders K, Miglioretti DL, Crane PK, van Belle G, et al. Association Between Obesity and Psychiatric Disorders in the US Adult Population. Arch Gen Psychiatry 2006;1;63:824.
18. Lin HY, Huang CK, Tai CM, Lin HY, Kao YH, Tsai CC, et al. Psychiatric disorders of patients seeking obesity treatment. BMC Psychiatry 2013;2;13:1.
19. Jorm AF, Korten AE, Christensen H, Jacomb PA, Rodgers B, Parslow RA. Association of obesity with anxiety, depression and emotional well-being: a community survey. Aust N Z J Public Health. 2003;27:434-40. doi:10.1111/j.1467-842x.2003.tb00423.x
20. Puhl RM, Heuer CA. The Stigma of Obesity: A Review and Update. Obesity 2009;6;17:941-64.
21. Carr D, Friedman MA. Is Obesity Stigmatizing? Body Weight, Perceived Discrimination, and Psychological Well-Being in the United States. J Health Soc Behav 2005;24;46:244-59.
22. Cairney J, Corna LM, Veldhuizen S, Kurdyak P, Streiner DL. The Social Epidemiology of Affective and Anxiety Disorders in Later Life in Canada. The Canadian Journal of Psychiatry 2008;1;53:104-11.
23. Kessler RC, Petukhova M, Sampson NA, Zaslavsky AM, Wittchen HU. Twelve-month and lifetime prevalence and lifetime morbid risk of anxiety and mood disorders in the United States. Int J Methods Psychiatr Res 2012;21:169-84.
24. Ostrovsky NW, Swencionis C, Wylie-Rosett J, Isasi CR. Social anxiety and disordered overeating: An association among overweight and obese individuals. Eat Behav 2013;14:145-8.
25. Mirijello A, D'Angelo C, Iaconelli A, Capristo E, Ferrulli A, Leccesi L, et al. Social phobia and quality of life in morbidly obese patients before and after bariatric surgery. J Affect Disord 2015;179:95-100.
26. Kindred R, Bates G. The Influence of the COVID-19 Pandemic on Social Anxiety: A Systematic Review. Int J Environ Res Public Health 2023;29;20:2362.
27. Hawes MT, Szenczy AK, Klein DN, Hajcak G, Nelson BD. Increases in depression and anxiety symptoms in adolescents and young adults during the COVID-19 pandemic. Psychol Med 2022;13;52:3222-30.
28. Gualdi-Russo E, Rinaldo N, Masotti S, Bramanti B, Zaccagni L. Sex Differences in Body Image Perception and Ideals: Analysis of Possible Determinants. Int J Environ Res Public Health 2022;26;19:2745.
29. Zaki ME, El-Bassyouni HT, Yousef W, Mohamed R, El Toukhy S, Ismail S. Body image, Anxiety, Depression and DNA damage in Obese Egyptian Women. Middle East Journal of Medical Genetics 2019;8:41-7.
30. Buote VM, Wilson AE, Strahan EJ, Gazzola SB, Papps F. Setting the bar: Divergent sociocultural norms for women's and men's ideal appearance in real-world contexts. Body Image 2011;8:322-34.
31. Korkmaz H, Savrun A, Önal D, Pehlivanoğlu B. Is the Relation between Waist Circumference and Anxiety Scores Gender Specific? Gazi Medical Journal 2022;1;33:220.
32. Xu Y, López M. Central regulation of energy metabolism by estrogens. Mol Metab 2018;15:104-15.
33. Jiotsa B, Naccache B, Duval M, Rocher B, Grall-Bronnec M. Social Media Use and Body Image Disorders: Association between Frequency of Comparing One's Own Physical Appearance to That of People Being Followed on Social Media and Body Dissatisfaction and Drive for Thinness. Int J Environ Res Public Health 2021;11;18:2880.
34. Singh D. Adaptive significance of female physical attractiveness: Role of waist-to-hip ratio. J Pers Soc Psychol 1993;65:293-307.
35. Alcaraz Ibáñez M, Cren Chiminazzo JG, Sicilia Á, Teixeira Fernandes P. Examining the psychometric properties of the Body Appreciation Scale-2 in Brazilian adolescents. Psychology, Society & Education 2017;26;9:505-15.
36. Atari M. Factor structure and psychometric properties of the Body Appreciation Scale-2 in Iran. Body Image 2016;18:1-4.
37. Blowers LC, Loxton NJ, Grady-Flesser M, Occhipinti S, Dawe S. The relationship between sociocultural pressure to be thin and body dissatisfaction in preadolescent girls. Eat Behav 2003;4:229-44.
38. Zartaloudi A, Christopoulos D, Kelesi M, Govina O, Mantzorou M, Adamakidou T, et al. Body Image, Social Physique Anxiety Levels and Self-Esteem among Adults Participating in Physical Activity Programs. Diseases 2023;27;11:66.
39. Sjöström L, Lindroos AK, Peltonen M, Torgerson J, Bouchard C, Carlsson B, et al. Lifestyle, Diabetes, and Cardiovascular Risk Factors 10 Years after Bariatric Surgery. N Engl J Med 2004;23;351:2683-93.
40. Odom J, Zalesin KC, Washington TL, Miller WW, Hakmeh B, Zaremba DL, et al. Behavioral Predictors of Weight Regain after Bariatric Surgery. Obes Surg 2010;25;20:349-56.