JOURNAL
OF THE CANADIAN ACADEMY OF CHILD AND ADOLESCENT PSYCHIATRY / DE L'ACADÉMIE CANADIENNE DE PSYCHIATRIE DE L'ENFANT ET DE L'ADOLESCENT

The Impact of Lipomastia on Self-Esteem and Social Anxiety in Adolescents with Obesity

Özlem Kara[1]; Nazan Kaymaz[2]; Hande Şirin[3]; Mehmet Erdem Uzun[3]

Abstract:

Background: Obesity can negatively impact adolescents' self-esteem, and lipomastia can further complicate the situation. **Objective:** The current study endeavors to examine the influence of lipomastia on the levels of social anxiety and self-esteem in individuals with obesity. **Methods:** Seventy adolescent male outpatients with obesity completed a form of demographics, the SAS-A (Social Anxiety Scale for Adolescents), and the Rosenberg Self-Esteem Scale (RSES-10 item). Participants were stratified according to the presence of lipomastia, and correlation analyses were conducted to investigate the association between social anxiety and self-esteem in relation to lipomastia. **Results:** No significant difference was found between the lipomastia and non-lipomastia groups regarding self-esteem. While the lipomastia group had slightly higher overall social anxiety scores, significant differences were noted only in fear of negative evaluation. There was no relationship between the SAS-A total score and anthropometric measurements in both groups. However, a negative relationship was observed between self-esteem and anthropometric measurements in the lipomastia group, whereas such a relationship was not observed in the control group. **Conclusion:** Adolescents with lipomastia showed higher social anxiety, particularly fear of negative evaluation, despite similar demographic and anthropometric characteristics to their peers. Higher BMI correlated with lower self-esteem, highlighting the complex interplay between body image, self-esteem, and social anxiety. These findings underscore the need for targeted interventions to support adolescents with obesity and lipomastia.

Keywords: adolescents, lipomastia, obesity, self-esteem, social anxiety

[1] *Department of Pediatric Endocrinology, University of Health Sciences Bursa Yuksek Ihtisas Training and Research Hospital, Bursa, Turkey*
[2] *Department of Pediatric, Çanakkale Onsekiz Mart University, Faculty of Medicine, Çanakkale, Turkey*
[3] *Department of Pediatric and Adolescent Psychiatry, University of Health Sciences Bursa Yuksek Ihtisas Training and Research Hospital, Bursa, Turkey*

Contact Email: ozlem.kara@sbu.edu.tr

Submitted: September 17, 2024 ; Accepted: April 3, 2025

Introduction

Nonconformity to idealized body standards represents a reality that can adversely affect the body image of individuals with obesity, leading them to engage in critical thoughts about their bodies and undermining their self-esteem [1]. In addition to the internal turmoil that individuals may experience, concerns regarding societal beauty standards can exacerbate anxieties related to social alienation and discrimination [2]. The presence of both internal and external pressures may lead to a decrease in individuals' self-esteem. This, in turn, can result in a tendency to avoid social interactions and experience feelings of isolation. Such occurrences can have a profound impact on individuals' mental health and well-being, which can be detrimental to their personal and professional growth [3]. Therefore, individuals need to recognize the impact of such pressures and take proactive measures to mitigate their effects. The apprehension of facing potential negative reactions due to non-adherence to the prevalent beauty standards of society can become a major source of concern for individuals grappling with obesity [4]. The

negative impact on self-esteem, coupled with the experience of social anxiety, can pose significant challenges for such individuals in managing their condition [5].

The intricate relationship between social anxiety and self-esteem in individuals with obesity is subject to a multitude of complex factors, including but not limited to prevailing societal norms, personal experiences, and the influence of family and environment. Although it may not be possible to establish a direct causal relationship between these variables, they have the potential to negatively impact each other in an interdependent manner [6].

Physical changes during adolescence can significantly influence psychosocial development. Concerns related to aesthetics and the fear of not conforming to societal norms may foster a sense of not meeting societal body standards, which, in turn, impacts self-esteem and self-worth, contributing to various psychopathological conditions [5].

The intricate relationship between social anxiety and self-esteem in individuals with obesity is subject to a multitude of complex factors, including but not limited to prevailing societal norms, personal experiences, and the influence of family and environment. Although it may not be possible to establish a direct causal relationship between these variables, they have the potential to negatively impact each other in an interdependent manner [6].

Physical changes during adolescence can significantly influence psychosocial development. Concerns related to aesthetics and the fear of not conforming to societal norms may foster a sense of not meeting societal body standards, which, in turn, impacts self-esteem and self-worth, contributing to various psychopathological conditions [7]. Behavioral problems, eating disorders, depression, and psychosomatic complaints, all of which are especially prevalent in adolescence, are associated with low self-esteem [8]. Two well-established contributors to low self-esteem related to appearance in male adolescents are obesity and pubertal gynecomastia (PG). Research indicates that each of these conditions independently exerts a negative influence on psychological well-being [9, 10]. Lipomastia, characterized by an excess accumulation of fat in the breast tissue, may coexist with obesity [11]. However, the precise role of lipomastia in contributing to low self-esteem in the context of obesity remains inadequately understood. Like gynecomastia, lipomastia has the potential to adversely affect an individual's psychological well-being. Given the significant similarities in appearance between lipomastia and gynecomastia, these two conditions are often difficult for patients to distinguish [12]. Therefore, the present study seeks to examine whether lipomastia further exacerbates the psychological burden in individuals with obesity. Aesthetic concerns and worries about not conforming to societal norms in men can lead to a sense of not meeting society's general body standards, which in turn affects self-esteem and self-worth, thereby contributing to social anxiety. Societal expectations, stigma, and social comparisons may lead to social isolation and avoidance tendencies in men experiencing lipomastia [13]. This condition, therefore, has a significant impact on the psychological well-being of individuals, which necessitates attention. Low self-esteem and social anxiety are not only distressing emotions but also play a role in the emergence of various psychopathological conditions [6]. This can lead to a more difficult adolescence. Behavioral problems, eating disorders, depression, and psychosomatic complaints, especially prevalent in adolescents, have been reported to be associated with low self-esteem [10]. It is reported that individuals with low self-worth often experience a higher frequency of psychopathology, with depression and personality disorders frequently accompanying low self-esteem. While social rejection may not directly lead to psychopathology, it is often argued to influence one’s self-worth [14].

The current study endeavors to examine the influence of lipomastia on the levels of social anxiety and self-esteem in individuals with obesity.

Methods

Ethical Considerations

The study received approval from the local ethics committee of Bursa Yüksek Ihtisas Training and Research Hospital's Clinical Research Ethics Committee (Approval Number: 2011-KAEK-25, 2023/01-01) and was conducted in accordance with the principles of the Declaration of Helsinki. Before the procedures, all subjects and their caregivers provided written informed consent, ensuring their voluntary participation in the study and the confidentiality of their information. All participants were given enough time to carefully review the consent forms and ask any relevant questions before signing them.

Study Design and Participants

This cross-sectional study included male adolescents diagnosed with exogenous obesity who were followed up at the pediatric

endocrinology clinic of Bursa Yüksek İhtisas Training and Research Hospital. Exogenous obesity was defined as obesity not caused by endocrine, metabolic, or genetic conditions. Patients with comorbidities were systematically excluded from the study. Evaluations of comorbid conditions were conducted following standard clinical practices and existing medical documentation, thereby excluding disorders such as hypertension, hypothyroidism, dyslipidemia, psychiatric conditions, and syndromic causes.

Measures

The data collection tools comprised the SAS-A (Social Anxiety Scale for Adolescents) and the Rosenberg Self-Esteem Scale (RSES). The adolescents actively participated in the process by completing the scales autonomously.

Social Anxiety Scale for Adolescents (SAS-A)

The Social Anxiety Scale for Adolescents (SAS-A) was developed by La Greca and Lopez [15]. Confirmatory factor analysis of the SAS-A with adolescents, conducted by La Greca, Lopez and other researchers [16], supported the three-factor model of social anxiety: fear of negative evaluation by peers (FNE), social avoidance and distress in new situations (SAD-New), and social avoidance and distress-general (SAD-General). The SAS-A consists of 22 items (but 4 are filler items) arranged in a 5-point Likert rating format. By summing the ratings for the 18 anxiety items, the total score can be obtained, which ranges from 18 to 90.

The Turkish adaptation of the scale was conducted by Aydın and Tekinsav Sütçü [17].

The Rosenberg Self-Esteem Scale (RSES)

The Rosenberg Self-Esteem Scale (RSES), developed by sociologist Morris Rosenberg, is a widely used measure of self-esteem in social science research [18]. The scale has 12 subtests in total. Only the Self-esteem subscale was used in this study. The instrument comprises ten items that utilise a Likert-type scale to evaluate both positive and negative self-assessments. Five of the ten items reflect positive evaluations, while the remaining five reflect negative ones. Items 7 and 8 are reverse-coded. Participants are required to provide their evaluation on a four-point scale ranging from "1 = Completely Agree" to "4 = Strongly Disagree". The Gutmann grading technique categorises participants into three groups based on their scores: high self-esteem (scores of 0-1), medium self-esteem (scores of 2-4), and low self-esteem (scores of 5-6).
The Turkish adaptation of the scale was conducted by Çuhadaroğlu (1986), and its validity and reliability were subsequently tested. The study revealed a validity coefficient of 0.71 and an alpha value of 0.75 for the self-esteem scale [19].
Anthropometric Measurements
The measurements were performed between 8:00 a.m. and 9:00 a.m. after an overnight fast of at least 8 hours and with an empty bladder.

Body Weight, Body Height, and Body Mass Index

Body weight and height were measured while wearing underwear but no outer clothing orshoes. A stadiometer, calibrated daily, was used to measure body weight and height for all patients (Seca 703, accurate to 0.1 kg, Seca GmbH & Co. KG, Hamburg, Germany). Height was accurate to within 0.1 cm, and weight was accurate to within 0.1 kg. The body mass index (BMI) was computed using the formula that divides the weight in kilograms by the square of height in meters. A BMI value higher than the 95th percentile was used to indicate obesity.

Waist and Hip Circumferences

Waist circumference (in cm) and hip circumference (in cm) were measured using an inelastic tape with an accuracy of 0.1 cm at the midpoint between the lower rib and the top of the iliac crest in the expiration position. Hip circumference was measured at the maximum protuberance of the buttocks. An average of two measurements of each was recorded.

Identifying Lipomastia

Pseudogynecomastia (lipomastia) is due to an increase in breast fat, not glandular tissue. When examining the patient with pseudogynecomastia, the fingers will not meet any resistance until they reach the nipple. There is no discrete rubbery mass and no palpable disc edge in pseudogynecomastia [20]. The patient was positioned supine with their hands interlocked beneath their head during the physical examination. With the thumb and index finger separated, the examiner delicately opposed them bilaterally on the breast. A fibro-glandular region was palpated beneath the nipple and within the areolar complex, measuring a minimum of 0.5 cm in diameter, collectively denoting the presence of lipomastia.

Data Analysis

Statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS) version 21. Continuous variables, including age, self-esteem scores, social anxiety scores, and anthropometric measurements, were summarized using Mean (M) and Standard Deviation (SD) to represent central tendency and dispersion, respectively.

Statistical analyses comprised a Chi-square test to assess the association between lipomastia presence and self-esteem categories, a Spearman correlation coefficient to determine the strength and direction of the relationship between lipomastia presence and self-esteem levels, and an independent samples t-test or Mann-Whitney U test to compare mean social anxiety scores and their sub-dimensions (FNE, SAD-General, SAD-New) between lipomastia and non-lipomastia groups, aiming to discern significant differences in social anxiety levels among participants with and without lipomastia.

Pearson or Spearman correlation analyses were performed to explore the relationships between anthropometric measures (e.g., body weight, BMI, waist circumference) and self-esteem or social anxiety scores. Statistical significance was determined using p-values. A significance level (α) of 0.05 is commonly used to assess whether observed differences or correlations are likely to have occurred by chance.

Results

The study comprised 70 participants aged between 12 and 17 years (mean ± SD, 14.21 ± 1.65). The participants were classified into two groups based on the presence of lipomastia. The anthropometric measurements of both groups were similar (Table 1)

Self-Esteem

In the low self-esteem category, there were no individuals from either the lipomastia r or the non-lipomastia groups. Both groups predominantly fell into the high self-esteem category. The p-value of 0.48 indicates that there is no statistically significant difference between the lipomastia and non-lipomastia groups based on self-esteem (Table 2).

Social Anxiety

The overall social anxiety score was slightly higher in the lipomastia group, with a p-value of 0.05. The Fear of Negative Evaluation (FNE) sub-scale was significantly higher in the lipomastia group, indicating a heightened concern about being negatively judged or evaluated (p = 0.01). However, there were no significant differences between the two groups in general social avoidance and distress (SAD-General) or social avoidance distress in new situations (SAD-New) (Table 2).

Table 1. Anthropometric parameters of groups

	Lipomastia group n=47	Non-lipomastia group n=23	p
Age, year	14.05±1.56	14.54±1.81	0.36 ±
Body weight, kg	92.19±25.41	86.91±17.25	0.37‡
Body weight, sd	2.57±1.16	2.12±0.94	0.10‡
Height, cm	167.62±10.39	165.56±13.01	0.47‡
Height sd	0.75±1.12	0.30±0.98	0.10‡
BMI, kg/m^2	32.25±6.22	30.78±3.97	0.48 ±
BMI sd	2.39±0.81	2.16±0.59	0.24‡
Waist circumference (cm)	106.62±15.25	102.26±9.99	0.21‡
Hip circumference (cm)	114.83±13.63	113.91±8.32	0.76‡

Values are reported as mean and standard deviation ±Mann-Whitney U
‡Independent samples t-test sd, standard deviation; BMI, Body mass index

Table 2. Self-esteem and social anxiety scores of groups

	Lipomastia Group (n=47)	Non- Lipomastia Group (n=23)	p
Self-esteem category *			
Low	0 (0)	0 (0)	
Medium	10 (21)	4 (17)	0.48¶
High	37 (79)	19 (83)	
Total point of SAS-A	59.06±14.61	52.22±11.35	0.05‡
Sub-scale of SAS-A			
FNE	17.26±7.49	13.09±5.16	**0.01**±
SAD-General	10.13±4.09	9.04±3.14	0.38±
SAD-New	17.09±5.43	15.78±4.58	0.32‡

Values are reported as mean and standard deviation
*n (%) ¶Chi-square test ±Mann-Whitney U ‡Independent samples t-test
SAS-A, Social Anxiety Scale for Adolescents; FNE, Fear of negative evaluation by peers; SAD-General, Social avoidance and distress-general; SAD-New, social avoidance and distress in new situations

Correlations

When the correlation between the SAS-A total score and anthropometric measurements was analysed, no correlation was found in either group (Tables 3-4).

When the relationship between self-esteem and anthropometric measurements in the lipomastia group was analysed, it was observed that there was a negative relationship between body mass index, waist and hip circumference (Table 3). However, a similar relationship was not found in the control group (Table 4).

Discussion

This study investigated the psychosocial impact of lipomastia on adolescents aged 12 to 17 years, with a particular emphasis on self-esteem and social anxiety. The findings offer significant insights into the manner in which this condition affects the

Table 3. The correlation between anthropometric measurement and self-esteem score and social anxiety score in lipomastia group

Parameters	Total point of self-esteem		Total point of SAS-A	
	r	p	r	p
Body weight	-0.24	0.09	0.04	0.76
Height	0.004	0.97	-0.08	0.57
BMI	-0.34	***0.01***	0.15	0.30
Waist circumference	-0.34	***0.01***	0.20	0.16
Hip circumference	-0.32	***0.02***	0.16	0.26
Lipomastia size	-0.23	0.05	0.01	0.90

BMI, Body mass index ; SAS-A, Social Anxiety Scale for Adolescents

Table 4. The correlation between anthropometric measurement and self-esteem score and social anxiety score in control group

Parameters	Total point of self-esteem		Total point of SAS-A	
	r	p	r	p
Body weight	-0.03	0.86	-0.15	0.47
Height	0.06	0.78	-0.36	0.09
BMI	-0.05	0.79	0.01	0.93
Waist circumference	-0.13	0.55	-0.15	0.96
Hip circumference	-0.01	0.56	-0.03	0.86

BMI, Body mass index; SAS-A, Social Anxiety Scale for Adolescents

psychological well-being of male adolescents.

Relationship Between Lipomastia and Self-Esteem

The absence of participants in the low self-esteem category, coupled with the predominance of high self-esteem levels observed among both groups, suggests that lipomastia does not significantly influence self-esteem in this particular age group. This finding aligns with the extant literature, which posits that adolescents can exhibit resilience in the face of physical differences [1, 14]. Similarly, Rosenberg's foundational work on self-esteem highlights that adolescents often derive self-worth from a combination of personal and social factors, which can mitigate the impact of physical differences [18]. However, this finding contrasts with other studies indicating that physical conditions such as obesity or gynecomastia can negatively impact self-esteem during adolescence [9, 10]. Similar to these studies, our study also found a negative relationship between anthropometric factors, such as BMI, waist, and hip measurements, and self-esteem in the lipomastia group, indicating that body dissatisfaction can indirectly affect self-esteem. This discrepancy may be attributable to cultural or contextual differences, such as greater social acceptance or awareness in our sample population. It is also possible that the use of coping mechanisms, family support or peer relationships plays an important role in maintaining high self-esteem despite the presence of lipomastia. These findings underline the complex interaction between physical characteristics and psychological consequences. Anthropometric factors, such as BMI, show a negative correlation with self-esteem in the lipomasti group, while high self-esteem scores suggest that other protective factors are at play. Future research can focus on identifying these protective factors, such as family dynamics, peer support, or access to psychosocial interventions, to better understand how adolescents protect their self-esteem in the face of physical challenges.

The correlations between anthropometric parameters and psychosocial variables offer an interesting model. While there was a negative relationship between self-esteem and BMI, waist and hip circumference in the adolescents with lipomastia, no similar relationship was observed in the control group. This shows that individuals with lipomastia may experience original psychosocial difficulties related to body dissatisfaction. Similarly, it has been reported in the literature that weight and body perception have significant effects on self-esteem and anxiety [5, 21].

Moreover, the present study found that adolescents with obesity and lipomastia exhibit tendencies towards diminished lower self-esteem compared to those without lipomastia. This finding underscores the importance of addressing body image concerns, particularly in individuals with lipomastia, to promote psychological well-being and self-perception.

Several studies in the current literature have investigated the relationship between self-esteem and obesity [21, 22]. However, it is unclear whether self-esteem is consistently associated with obesity, whether the relationship is global or specific to physical appearance, whether it varies by demographic variables such as age, gender, or race and ethnicity, or whether self-esteem affects weight.

The relationship between physical appearance and self-esteem in individuals with obesity has been primarily established through anthropometric measurements, such as BMI [1]. To the

best of our knowledge, this study is the first to investigate the relationship between lipomastia and self-esteem in this group. Clinicians and healthcare professionals should be mindful of the potential impact of lipomastia on self-esteem and consider incorporating interventions to enhance body image and self-esteem into treatment plans for individuals affected by this condition. Moreover, further research is warranted to explore the mechanisms underlying the relationship between lipomastia and self-esteem in order to develop targeted interventions and support strategies for individuals affected by this condition. Ultimately, efforts to enhance self-esteem in individuals with lipomastia may improve overall mental health and quality of life for this population.

Relationship Between Lipomastia and Social Anxiety

Slightly higher social anxiety scores in the lipomasti group and a statistically significant difference in the subscale of negative evaluation (FNE) showthat adolescents with lipomastia may be more sensitive to peer evaluations. This supports the studies suggesting that physical differences can increase sensitivity to social feedback in adolescence [10, 15]. Puhl et al emphasized that stigma related to physical differences, such as obesity or gynecomastia, can exacerbate fears of negative evaluation, potentially leading to long-term psychosocial challenges [2].

However, the finding that there is no significant difference in general social avoidance or distress in new social situations shows that the effect in adolescents with lipomastia on social functionality may be limited. This shows that social anxiety focuses more on the fear of being evaluated in adolescent men. Previous studies have reported that social anxiety in adolescence is closely related to peer relationships [15]. Individuals with obesity often exhibit a higher likelihood of experiencing social anxiety, a phenomenon influenced by various factors such as societal stigma, discrimination, body image dissatisfaction, and fear of negative social evaluation [5]. Several studies have linked social anxiety in individuals with obesity to metabolic changes and anthropometric measurements exceeding standard parameters. Specifically, research indicates that people with higher BMI or larger waist circumferences are more likely to exhibit symptoms of social anxiety [23, 24].

In the general population, higher BMI values were associated with lower self-esteem, while no association was found with social anxiety, thereby underlining the complexity of the relationship between body weight, self-perception and psychological well-being. However, in both groups, the study was unable to demonstrate the effect of higher anthropometric measures, including BMI, hip and waist circumference, on social anxiety scores. This nuance is important for understanding the selective impact of physical appearance on social functioning, as also discussed by Apaolaza *et al* [5].

This study shows that social anxiety and self-esteem in adolescents with lipomastia should be addressed in more detail. In individuals with lipomastia, educational programsthat positively support body perception and group therapy approaches to reduce social anxiety are recommended. Puhl and Brownell state that reducing stigma related to physical differences can support individuals' psychological well-being [2].

Conclusion

While there were no significant differences between the lipomastia and non-lipomastia groups in most demographic and anthropometric characteristics, adolescents with lipomastia showed slightly higher social anxiety scores, especially in fear of negative evaluation. Furthermore, higher BMI values were associated with lower self-esteem in the whole sample. These findings suggest complex links between body image, self-esteem, and social anxiety, especially in adolescents who struggle with obesity and have developed lipomastia. Further research is needed to better understand these links and to develop effective interventions that may help adolescents struggling with obesity and lipomastia.

The cross-sectional nature of the study limits the ability to determine causal relationships. Furthermore, the small sample size may reduce generalisability. Future studies could employ a longitudinal design to investigate the long-term psychosocial effects of lipomastia and to assess the impact of other factors, such as family support and peer relationships.

Conflict of Interest

The authors declare that they have no conflicts of interest.

Funding Sources

This research did not receive a specific grant.

References

1. Pop C: Self-esteem and body image perception in a sample of university students. Eurasian Journal of Educational Research 2016, 16(64):31-44.
2. Puhl RM, Brownell KD: Psychosocial origins of obesity stigma: toward changing a powerful and pervasive bias. Obesity reviews 2003, 4(4):213-227.
3. Rojo López AM, Cifuentes Férez P, Espín López L: The influence of time pressure on translation trainees' performance: Testing the relationship between self-esteem, salivary cortisol and subjective stress response. PloS one 2021, 16(9):e0257727.
4. Groves M, Muskin PR: Psychological responses to illness. The American Psychiatric Publishing textbook of psychosomatic medicine: psychiatric care of the medically III 2011, 2:45-67.
5. Apaolaza V, Hartmann P, D'Souza C, Gilsanz A: Mindfulness, compulsive mobile social media use, and derived stress: The mediating roles of self-esteem and social anxiety. Cyberpsychology, Behavior, and Social Networking 2019, 22(6):388-396.
6. Rapee RM, Oar EL, Johnco CJ, Forbes MK, Fardouly J, Magson NR, Richardson CE: Adolescent development and risk for the onset of social-emotional disorders: A review and conceptual model. Behaviour research and therapy 2019, 123:103501.
7. O'Dea JA: Body image and self-esteem. 2012.
8. Pelc A, Winiarska M, Polak-Szczybyło E, Godula J, Stępień AE: Low self-esteem and life satisfaction as a significant risk factor for eating disorders among adolescents. Nutrients 2023, 15(7):1603.
9. Nuzzi LC, Cerrato FE, Erikson CR, Webb ML, Rosen H, Walsh EM, DiVasta AD, Greene AK, Labow BI: Psychosocial impact of adolescent gynecomastia: a prospective case-control study. Plastic and reconstructive surgery 2013, 131(4):890-896.
10. Moradi M, Mozaffari H, Askari M, Azadbakht L: Association between overweight/obesity with depression, anxiety, low self-esteem, and body dissatisfaction in children and adolescents: a systematic review and meta-analysis of observational studies. Critical Reviews in Food Science and Nutrition 2021, 62(2):555-570.
11. Soliman AT, De Sanctis V, Yassin M: Management of adolescent gynecomastia: an update. Acta Bio Medica: Atenei Parmensis 2017, 88(2):204.
12. Kanakis G, Nordkap L, Bang A, Calogero A, Bártfai G, Corona G, Forti G, Toppari J, Goulis D, Jørgensen N: EAA clinical practice guidelines—gynecomastia evaluation and management. Andrology 2019, 7(6):778-793.
13. Vartanian LR: When the body defines the self: Self-concept clarity, internalization, and body image. Journal of Social and Clinical Psychology 2009, 28(1):94-126.
14. Zeigler-Hill V: The connections between self-esteem and psychopathology. Journal of contemporary psychotherapy 2011, 41:157-164.
15. La Greca AM, Lopez N: Social anxiety among adolescents: Linkages with peer relations and friendships. Journal of abnormal child psychology 1998, 26:83-94.
16. Storch EA, Masia-Warner C, Dent HC, Roberti JW, Fisher PH: Psychometric evaluation of the Social Anxiety Scale for Adolescents and the Social Phobia and Anxiety Inventory for Children: Construct validity and normative data. Journal of anxiety disorders 2004, 18(5):665-679.
17. Aydın A, Sütcü ST: Validity and reliability of social anxiety scale for adolescents (SAS-A). Turkish Journal of Child and Adolescent Mental Health 2007, 14(2):79-89.
18. Rosenberg M: Rosenberg self-esteem scale (RSE). Acceptance and commitment therapy Measures package 1965, 61(52):18.
19. Çuhadaroğlu F: Adolesanlarda benlik saygısı. Uzmanlık Tezi, Hacettepe Üniversitesi Tıp Fakültesi Psikiyatri Anabilim Dalı, Ankara 1986.
20. Braunstein GD: Gynecomastia. New England Journal of Medicine 2007, 357(12):1229-1237.
21. Griffiths LJ, Parsons TJ, Hill AJ: Self-esteem and quality of life in obese children and adolescents: A systematic review. International Journal of Pediatric Obesity 2010, 5(4):282-304.
22. French SA, Story M, Perry CL: Self-esteem and obesity in children and adolescents: a literature review. Obesity research 1995, 3(5):479-490.
23. Jaremka LM, Pacanowski CR: Social anxiety symptoms moderate the link between obesity and metabolic function. Psychoneuroendocrinology 2019, 110:104425.
24. Wang J, Ran X, Ye J, Deng R, Dang W, Fan Y, Hu Z, Yang L, Dong W, Lv Y: Obesity-Associated anxiety is prevalent among College Students and alleviated by calorie restriction. Nutrients 2022, 14(17):3518.