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Peer Victimization and Psychological Outcomes in Adolescents with Pubertal Gynecomastia: A Case-Control Study

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ABSTRACT

Objective: Pubertal gynecomastia is associated with psychosocial consequences including anxiety, depression, and body image disturbances. However systematic examination of bullying experiences and their psychological correlates in adolescents with gynecomastia remains limited. The aim of this study was to investigate peer victimization prevalence and its relationship with psychological outcomes in this vulnerable population.

Methods: This case-control study included male adolescents aged 10-17 years, comprising half with gynecomastia and half healthy controls. Gynecomastia diagnosis and severity were assessed using clinical examination and Rohrich classification. Participants completed validated Turkish versions of the Olweus Bully/Victim Questionnaire, Rosenberg Self-Esteem Scale, and Revised Child Anxiety and Depression Scale.

Results: A total of 155 adolescents were included, with 78 (50.3%) having gynecomastia and the remaining 77 being healthy. Adolescents with gynecomastia demonstrated significantly higher peer victimization rates compared to controls (34.6% versus 16.9%, p=0.012), with markedly increased victim-perpetrator status (12.8% versus 1.3%, p=0.005). Gynecomastia diagnosis increased victimization risk 2.63-fold (95% confidence interval: 1.076-6.436, p=0.034). Victimized participants exhibited elevated anxiety and depression scores across multiple symptom domains (p<0.05). Behavioral modifications were prevalent, including altered clothing preferences (58.9%), changing room avoidance (44.8%), and swimming avoidance (41.0%).

Conclusion: Adolescents with gynecomastia experienced substantially elevated peer victimization with consequential psychological impact in this cohort. These findings suggest the importance of routine bullying assessment during clinical evaluation and implementation of comprehensive psychosocial screening protocols with early intervention strategies.

Keywords: Pubertal gynecomastia, peer victimization, bullying, adolescents, anxiety, depression

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What is already known on this topic?

Pubertal gynecomastia affects approximately 1% of adolescents and is associated with psychosocial difficulties. Physical appearance differences increase bullying risk in adolescents. Limited research has systematically examined bullying experiences in adolescents with gynecomastia.

What this study adds?

Adolescents with gynecomastia experience 2.63-fold increased peer victimization risk. Victimized adolescents show significantly elevated anxiety and depression across multiple domains compared with non-gynecomastic peers. Routine bullying assessment should be integrated into clinical evaluation of gynecomastia patients.

Introduction

Pubertal gynecomastia (PG), defined as the benign enlargement of male breast tissue, represents one of the most common endocrine conditions encountered during puberty, affecting an estimated 1.08% of male adolescents aged 12-15 years according to recent population-based data (1). The condition typically manifests between the ages of 13-14 years, corresponding to Tanner stages 3-4, with bilateral involvement observed in approximately 90% of cases (2,3). While pubertal gynecomastia is largely physiological and resolves spontaneously within 1-3 years in most cases, persistent enlargement occurs in approximately 10% of adolescents by age 17 years, necessitating medical or surgical intervention (4). PG develops due to transient imbalances between androgens and estrogens during pubertal development, is idiopathic in over 95% of patients, although pathological causes including endocrine disorders, medications, and genetic syndromes account for less than 5% of cases (5,6).

PG represents a physical condition affecting adolescent males, yet its effects extend far beyond anatomical changes to encompass significant psychosocial consequences. Controlled research demonstrated that adolescents with gynecomastia exhibit impairments in social functioning, mental health, and self-esteem parameters compared to their healthy peers (7). The psychosocial manifestations include shame, anxiety, social isolation, body image disturbance, and excessive self-consciousness. PG is frequently associated with avoidance behaviors affecting physical activities and a decline in academic performance (7,8). Clinical studies have revealed elevated rates of anxiety disorders, depression, social phobia, disordered eating behaviors, and adjustment disorders among this population (7,9,10,11). Follow-up studies conducted after surgical intervention demonstrate improvements in patients' self-esteem, social functioning, and quality of life scores. These findings demonstrate the importance of early diagnosis and appropriately timed therapeutic interventions (10,12).

Peer victimization and bullying during adolescence have emerged as major public health concerns, with recent meta-analyses indicating that approximately 36% of adolescents worldwide experience some form of bullying victimization (13). The relationship between differences in physical appearance and increased bullying risk has been extensively documented (14,15). Beyond immediate psychological effects, systematic reviews demonstrate that bullying experiences have lasting consequences into adulthood, including depression, anxiety, self-harm behaviors, and suicidal ideation (16). Appearance-based bullying in particular shows particularly high correlations with body image issues, and low self-esteem in adolescent populations (14). The occurrence of different physical appearance and peer victimization may result in a complex and heterogeneous multifactorial situation that results in individual psychological distress. As such, this challenging occurrence warrants careful investigation in vulnerable populations, such as adolescents with medical conditions affecting appearance.

Despite the well-established psychological impact of gynecomastia and the documented relationship between appearance differences and bullying victimization, limited research has systematically examined the intersection of these phenomena. This lack of evidence is particularly concerning given that adolescents with visible physical differences may be at heightened risk for peer victimization, potentially amplifying the already significant psychological burden associated with gynecomastia. The aim of the present study was to investigate the prevalence of peer victimization among adolescents with gynecomastia compared to healthy controls, examine the relationship between bullying experiences and psychological outcomes, including self-esteem, anxiety, and depressive symptoms, and identify predictive factors for victimization within this vulnerable population. Through comprehensive assessment of both bullying experiences and psychological wellbeing, this research sought to inform evidence-based approaches to clinical care and intervention strategies for adolescents with gynecomastia.

Methods

This case-controlled study was conducted between June 2023 and January 2024 at University of Health Sciences Türkiye,

Başakşehir Çam and Sakura City Hospital, Clinic of Pediatric Endocrinology, İstanbul, Türkiye. The study protocol was approved by the Institutional Ethics Committee of University of Health Sciences Türkiye, Başakşehir Çam and Sakura City Hospital (approval no.: KAEK/2023.06.254, date: 2023) and conducted in accordance with the Declaration of Helsinki. Written informed consent was obtained from all participants and their parents or legal guardians prior to enrollment.

The study included male adolescents aged 10-17 years, divided approximately into half with gynecomastia and half healthy controls. Case group participants were recruited from patients presenting to the pediatric endocrinology outpatient clinic with a confirmed diagnosis of gynecomastia. Diagnosis of gynecomastia was established through clinical examination by a pediatric endocrinologist and severity assessed using the Rohrich classification (3). Control group participants were recruited from healthy adolescents attending routine pediatric check-ups or accompanying siblings to medical appointments.

Inclusion criteria for the gynecomastia group included being male, aged 10-17 years and with clinical diagnosis of gynecomastia confirmed by a pediatric endocrinologist. In addition, gynecomastia duration was ≥6 months, and participants had capacity to complete questionnaires in Turkish. Control group inclusion criteria included healthy male adolescents aged 10-17 years with no clinical evidence of gynecomastia, no history of chronic medical conditions, no current psychiatric disorders requiring treatment, and age-matching to the gynecomastia group.

Exclusion criteria for both groups included presence of serious psychiatric disorders, such as psychosis, cognitive impairment preventing questionnaire completion, chronic medical conditions affecting psychological wellbeing, current use of psychotropic medications, and refusal to participate or provision of incomplete data.

Sample size was determined using G*Power software (version 3.1.9.2, Heinrich-Heine-Universität Düsseldorf, Germany) based on anticipated differences in peer victimization prevalence between groups. Given the limited literature on bullying in adolescents with gynecomastia, we assumed a medium effect size (Cohen's h=0.5) for the primary outcome, with α=0.05 and power (1-β)=0.80, yielding a required sample size of 64 participants per group. To ensure adequate power, we recruited in excess of this number for both case and control groups.

Clinical Assessment

All participants underwent comprehensive clinical evaluation, including measurement of height, weight, and calculation of body mass index (BMI) standard deviation scores (SDS) using Turkish reference standards (17). Gynecomastia severity was assessed using the Rohrich classification system. Pubertal development was evaluated according to Tanner staging. Additional clinical data collected included family history, medication use, and presence of any concurrent medical conditions.

For participants with gynecomastia, detailed clinical characteristics were documented including laterality (unilateral or bilateral), Rohrich grade, and associated behavioral modifications. The Rohrich classification is a clinically useful system developed to categorize the severity of gynecomastia based on the degree of breast hypertrophy and the degree of breast ptosis. It defines four grades: Grade 1 refers to minimal hypertrophy (<250 g) without ptosis; Grade 2 involves moderate hypertrophy (250-500 g) without ptosis; Grade 3 indicates severe hypertrophy (>500 g) with Grade 1 ptosis; and Grade 4 includes severe hypertrophy with more advanced ptosis (Grade 2 or 3). Higher grades therefore reflect greater breast enlargement and skin redundancy. In the present study, severity was graded clinically by a pediatric endocrinologist according to the degree of hypertrophy and ptosis, and the diagnosis of gynecomastia itself was established by clinical examination rather than by this grading scale (3). Specific behavioral modifications assessed included social avoidance behaviors, clothing preference changes favoring loose-fitting garments, avoidance of changing rooms, and avoidance of swimming pools or beaches.

Psychological Assessment Instruments

Peer Victimization Assessment

Bullying and victimization experiences were evaluated using the validated Turkish adaptation of the Olweus Bully/Victim Questionnaire (18,19). This comprehensive instrument consists of 39 items designed to assess various forms of peer aggression and victimization occurring within the preceding month. The questionnaire employs a frequency-based classification system, where participants reporting experiences occurring two to three times or more frequently are categorized into distinct groups: pure victims, pure perpetrators, bully-victims (individuals who both perpetrate and experience bullying), or uninvolved participants. The Turkish version has demonstrated satisfactory psychometric properties with internal consistency coefficients of α=0.81 in adolescent populations.

Self-Esteem Measurement

Global self-esteem was assessed using the ten-item self-esteem subscale from the Turkish adaptation of the Rosenberg Self-Esteem Scale (20,21). This widely utilized instrument evaluates overall self-worth and self-acceptance through items addressing personal satisfaction, self-respect, and perceived adequacy. Responses are recorded on a four-point Likert format ranging from strongly disagree to strongly agree, with higher composite scores reflecting enhanced self-regard. The Turkish version of this

subscale has demonstrated robust psychometric characteristics with validity coefficients of r=0.71 and test-retest reliability indices of r=0.75 in adolescent populations.

Anxiety and Depression Symptomatology

Psychological distress was measured using the Turkish version of the Revised Child Anxiety and Depression Scale (RCADS), a DSM-IV-aligned assessment tool comprising 47 items (22,23). The instrument evaluates six distinct symptom domains through dedicated subscales: generalized anxiety (6 items), separation anxiety (7 items), panic symptomatology (9 items), obsessive-compulsive features (6 items), social anxiety manifestations (9 items), and major depressive symptoms (10 items). Response options range across a four-point continuum from 0 (never experienced) to 3 (always experienced), with elevated scores indicating greater symptom severity. The Turkish adaptation has demonstrated excellent internal reliability with overall Cronbach's alpha coefficients of 0.95.

Data Collection Procedure

Data collection was conducted in a quiet, private room within the hospital setting. All questionnaires were administered by trained research personnel in a standardized manner. Participants completed the questionnaires individually, with research staff available to provide clarification when needed. The assessment session lasted approximately 20-45 minutes for each participant. Demographic information was collected through a structured interview with both the participant and accompanying parent or guardian.

Statistical Analysis

Statistical analyses were performed using SPSS (Statistical Package for the Social Sciences), version 27 (IBM Corp., Armonk, NY, USA). Descriptive statistics including frequencies and percentages were calculated for categorical variables; as continuous variables were not normally distributed, they were summarized as medians with minimum-maximum ranges. The normality of continuous variables was assessed using the Shapiro-Wilk test. Since the data did not meet normality assumptions, non-parametric tests were employed for group comparisons.

Categorical variables were compared between groups using chi-square tests or Fisher's exact test when appropriate. Continuous variables were compared using the Mann-Whitney U test for independent groups. Statistical significance was set at $p<0.05$ for all analyses.

Binary logistic regression analysis was performed to identify predictors of peer victimization. The overall model included group status (gynecomastia vs control), age, BMI-SDS, self-esteem scores, and total anxiety-depression scores as independent variables. A separate logistic regression analysis was conducted within the gynecomastia group to identify specific predictors of victimization among affected adolescents. Model fit was assessed using the Omnibus test, and the explained variance was reported using Nagelkerke R-squared values.

Results

Participant Characteristics

This case-control study included 155 male adolescents aged 10-17 years, with 78 (50.3%) participants diagnosed with gynecomastia and 77 healthy controls. The groups were well-matched for demographic characteristics, with no significant differences observed in grade level distribution, educational levels, or family income status (all $p>0.05$).

Anthropometric measurements revealed significant differences between groups. Participants with gynecomastia demonstrated significantly higher weight SDS and BMI-SDS ($p=0.001$) compared to controls. However, no significant differences were found in age, pubertal stage, height SDS, or daily screen time between the two groups.

The clinical presentation of gynecomastia was bilateral in 89.7% of participants. Distribution according to Rohrich grading system revealed that 34.6% were classified as Grade 2, 30.7% as 3, and 19.2% as 4. The physical changes associated with gynecomastia resulted in substantial behavioral modifications among affected adolescents. Social avoidance behaviors were reported by 43.5% of participants, while 58.9% experienced changes in clothing preferences, specifically favoring loose-fitting garments. In addition, 44.8% reported avoiding changing rooms and 41.0% avoided swimming pools or beaches, indicating significant impact on daily activities and social participation (Table 1).

Peer Victimization Outcomes

The primary analysis revealed markedly higher rates of peer victimization among adolescents with gynecomastia compared to controls. Overall victimization prevalence reached 34.6% in the gynecomastia group versus 16.9% in the control group ($p=0.012$), representing a significant two-fold increase. Furthermore, participants with gynecomastia demonstrated elevated rates of perpetrating bullying behaviors (15.4% vs 5.2%, $p=0.037$) and were significantly more likely to exhibit dual victim-perpetrator status (12.8% vs 1.3%, $p=0.005$) (Table 2).

Psychological Well-being Measures

Assessment of self-esteem using the Rosenberg Self-Esteem Scale revealed no significant difference between groups ($p=0.064$). Similarly, overall psychological symptoms measured by the RCADS showed comparable total scores between groups ($p=0.569$). Individual subscale analyses revealed no significant between-group differences for any RCADS domain (all $p>0.05$) (Table 3).

Impact of Victimization Within the Gynecomastia Group

Among participants with gynecomastia, those who experienced peer victimization demonstrated significantly elevated psychological distress across multiple domains compared to their non-victimized counterparts. Victimized adolescents showed markedly higher total RCADS scores (p=0.001).

Detailed analysis of symptom domains revealed significant elevations in social phobia (p=0.004), obsessive-compulsive symptoms (p=0.001), panic disorder (p=0.001), generalized anxiety (p=0.006), and depression (p=0.001). Despite these pronounced differences in psychological symptoms, self-esteem scores remained comparable between victimized and non-victimized participants with gynecomastia (p=0.695) (Table 4).

Table 1. Demographic and clinical characteristics of study participants

Characteristic	Gynecomastia group (n=78)	Control group (n=77)	p value
Age, years	14.13±1.87	13.97±1.82	0.661
Grade level, n (%)			0.797
Primary school	1 (1.3)	2 (2.6)	
Middle school	36 (46.2)	37 (48.1)	
High school	41 (52.6)	38 (49.4)	
Weight SDS	1.07±1.54	0.14±1.09	**0.001***
Height SDS	0.42±1.26	0.07±1.26	0.123
BMI SDS	1.01±1.34	0.16±0.93	**0.001***
Pubertal stage			0.975
Stage 2	10 (12.8)	11 (14.2)	
Stage 3	20 (25.6)	19 (24.6)	
Stage 4	16 (20.5)	17 (22)	
Stage 5	32 (41.0)	30 (38.9)	
Gynecomastia-specific characteristics			
Laterality n (%)			
Unilateral	8 (10.3)	-	-
Bilateral	70 (89.7)	-	-
Rohrich grade n (%)			
Grade 1	12 (15.4)	-	-
Grade 2	27 (34.6)	-	-
Grade 3	24 (30.7)	-	-
Grade 4	15 (19.2)	-	-
Behavioral modifications n (%)			
Social avoidance	34 (43.5)	-	-
Clothing preference changes	46 (58.9)	-	-
Changing room avoidance	35 (44.8)	-	-
Swimming/beach avoidance	32 (41.0)	-	-
Screen time, hours/day	4.97±2.97	4.15±2.75	0.061
Family income, n (%)			0.835
Below minimum wage	16 (20.5)	14 (18.2)	
Minimum wage - 2x	42 (53.8)	47 (61.0)	
2x-3x minimum wage	14 (17.9)	11 (14.3)	
>3x minimum wage	6 (7.7)	5 (6.5)	

*p<0.05; SDS: standard deviation score; BMI: body mass index

Predictive Factors for Peer Victimization

Logistic regression analysis across the entire sample identified two significant predictors of peer victimization. The presence of a diagnosis of gynecomastia emerged as the strongest predictor, increasing victimization risk by 2.63-fold (OR=2.631, 95% CI: 1.076-6.436, p=0.034). In addition, psychological symptom severity, as measured by total anxiety and depression scores, showed a dose-response relationship with victimization risk, with each unit increase associated with a 4% increase in victimization probability (OR=1.040, 95% CI: 1.021-1.060, p=0.001). This comprehensive model explained 24.2% of the variance in victimization status (Nagelkerke R^2=0.242).

Table 2. Peer victimization patterns by group

Victimization type	Gynecomastia group (n=78)	Control group (n=77)	p value
Overall victimization, n (%)	27 (34.6)	13 (16.9)	**0.012***
Victim only, n (%)	17 (21.8)	12 (15.6)	0.322
Perpetrator only, n (%)	2 (2.6)	3 (3.9)	0.639
Victim-perpetrator, n (%)	10 (12.8)	1 (1.3)	**0.005***
No involvement, n (%)	49 (62.8)	61 (79.2)	**0.025***

*p<0.05; chi-square test

Table 3. Psychological measures by group

Measure	Gynecomastia group (n=78)	Control group (n=77)	p value
Rosenberg self-esteem scale	24 (14-34)	23 (15-29)	0.064
RCADS total score	26 (0-120)	27 (1-87)	0.569
RCADS subscales			
Separation anxiety	2 (0-15)	3 (0-15)	0.476
Social phobia	7 (0-26)	8 (0-26)	0.793
Obsessive-compulsive	4 (0-18)	4 (0-15)	0.993
Panic disorder	2 (0-23)	3 (0-25)	0.199
Generalized anxiety	4.5 (0-18)	6 (0-16)	0.384
Major depression	4 (0-27)	5 (0-24)	0.399

Data presented as median (minimum-maximum); RCADS: revised child anxiety and depression scale; Mann-Whitney U test; p<0.05

Within the gynecomastia subgroup, a more nuanced pattern emerged. Higher total anxiety and depression scores remained a significant predictor of victimization (OR=1.080, 95% CI: 1.036-1.125, p=0.001), while elevated separation anxiety subscale scores demonstrated a protective association (OR=0.718, 95% CI: 0.529-0.974, p=0.033). This gynecomastia-specific model demonstrated enhanced explanatory power, accounting for 36.5% of the variance in victimization among affected adolescents (Nagelkerke R^2=0.365). Age, BMI SDS, self-esteem levels, and gynecomastia-related behavioral modifications did not emerge as significant predictors in either analytical model (Table 5).

Table 4. Psychological outcomes by victimization status within gynecomastia group

Measure	Victimized (n=27)	Non-victimized (n=51)	p value
Rosenberg self-esteem scale	24 (19-31)	24 (14-34)	0.695
RCADS total score	46 (4-103)	21 (0-120)	**0.001***
RCADS subscales			
Separation anxiety	3 (1-11)	2 (0-15)	0.124
Social phobia	11 (0-26)	7 (0-23)	**0.004***
Obsessive-compulsive	6 (0-18)	3 (0-15)	**0.001***
Panic disorder	6 (0-17)	1 (0-23)	**0.001***
Generalized anxiety	7 (1-16)	4 (0-18)	**0.006***
Major depression	11 (0-27)	3 (0-26)	**0.001***

Data presented as median (minimum-maximum); RCADS: revised child anxiety and depression scale; Mann-Whitney U test; *p<0.05

Discussion

This study employed a case-control design to examine the prevalence of peer victimization among adolescents with pubertal gynecomastia and its relationship with psychological outcomes, including self-esteem, anxiety, and depressive symptoms. Our findings indicate that adolescents with gynecomastia experienced significantly higher rates of peer victimization than healthy controls, and that victimized adolescents showed elevated anxiety and depressive symptoms across multiple domains. However, overall self-esteem, anxiety, and depression scores did not differ significantly between the two groups. These findings extend the limited existing literature by quantifying peer victimization and its psychological correlates in adolescents with gynecomastia using validated instruments and a matched control group.

Differences in physical appearance have been extensively shown to be significant risk factors for peer victimization (24,25,26,27). Thus, gynecomastia constitutes an important risk factor for bullying as a condition that significantly affects physical appearance during adolescence. Although studies examining bullying experiences in adolescents with gynecomastia remain limited, existing data support this relationship. Karpinski et al. (12) reported that 95.7% of adolescents with gynecomastia had a history of bullying, teasing, or shame related to their

Table 5. Logistic regression analysis: predictors of peer victimization.

Overall sample analysis				
Variable	**β**	**OR**	**95% CI**	**p value**
Gynecomastia diagnosis	0.967	2.631	1.076-6.436	**0.034***
Age	-0.066	0.936	0.747-1.173	0.566
BMI-SDS	0.140	1.151	0.812-1.631	0.430
Self-esteem score	-0.023	0.978	0.861-1.110	0.727
RCADS total score	0.039	1.040	1.021-1.060	**0.001***
Model: χ^2=27.774, p=0.001; Nagelkerke R^2=0.242 *p<0.05; OR: odds ratio; CI: confidence interval; BMI: body mass index; SDS: standard deviation score; RCADS: revised child anxiety and depression scale				
Gynecomastia group analysis				
Variable	**β**	**OR**	**95% CI**	**p value**
Age	-0.152	0.859	0.610-1.210	0.385
BMI SDS	0.374	1.454	0.896-2.359	0.130
Self-esteem score	0.013	1.013	0.851-1.206	0.881
RCADS total score	0.077	1.080	1.036-1.125	**0.001***
RCADS separation anxiety	-0.331	0.718	0.529-0.974	**0.033***
Clothing preference change	-0.507	0.602	0.187-1.945	0.397
Model: χ^2=23.568, p=0.001; Nagelkerke R^2=0.365 *p<0.05; OR: odds ratio; CI: confidence interval; BMI: body mass index; SDS: standard deviation score; RCADS: revised child anxiety and depression scale				

breast appearance. In a study published by Isik et al. (28) in 2025, adolescents with gynecomastia experienced significantly more teasing and attacks on personal belongings compared to controls, with an observed trend toward increased overall bullying scores. Our findings strengthen these data with our findings of 34.6% overall bullying prevalence and 2.63-fold increased risk ratio confirming that bullying risk is significantly elevated in adolescents with physical differences. The variation in prevalence rates across studies underscores the importance of methodological approaches used in bullying assessment. The 95.7% rate reported by Karpinski et al. (12) differs substantially from our finding of 34.6%. This difference likely reflects what was measured rather than a true discrepancy in prevalence: Karpinski et al. (12) retrospectively evaluated any lifetime ("ever") history of bullying, teasing, or shame related to breast appearance whereas our study used the Olweus questionnaire to capture current victimization occurring at a defined frequency threshold of two to three times per month or more. These two figures therefore correspond to different time frames—lifetime experience versus recent, recurrent victimization—which largely accounts for the difference in reported rates rather than reflecting a true discrepancy in bullying prevalence.

The complex relationship between psychological symptoms and bullying experiences has been comprehensively examined in the literature. As demonstrated in Reijntjes et al. (29) in a longitudinal meta-analysis, internalizing problems can serve as both antecedents and consequences of bullying. Cook et al. (30) published a meta-analytic study showing that children with elevated anxiety and depression symptoms have increased risk of bullying victimization. Similarly, bullying experiences have been documented to lead to long-term psychological consequences by Moore et al. (16) in a systematic review. In our study, each unit increase in RCADS total score increased bullying risk by 4%, demonstrating that this dose-response relationship is also valid in adolescents with gynecomastia. The gynecomastia group-specific analysis model demonstrated higher explanatory power compared to the general sample and was able to explain 36.5% of the variance in bullying. This indicates that bullying risk factors are more distinct and predictable in adolescents with gynecomastia. Therefore, early recognition and intervention for psychological symptoms in adolescents with gynecomastia may be important for reducing bullying risk.

The clinical significance of adolescents exhibiting a mixed bully-victim profile has been documented in comprehensive research in recent years. Ariani et al. (31) undertook a global meta-analysis published in 2025, which examined 116 studies and 603,231 participants; the prevalence of adolescents with a mixed bully-victim profile was reported as 16%. Cook et al. (30) suggested that bullying experiences can serve as both antecedents and consequences, creating a complex cycle. In our study, the proportion of adolescents with a bully-victim profile in the gynecomastia group was 10 times higher compared to the control group (12.8% versus 1.3%), indicating that adolescents with physical differences were overrepresented in this category. This suggests that adolescents with gynecomastia may not only experience bullying victimization but may also exhibit bullying behaviors themselves, emphasizing the necessity for comprehensive psychosocial assessment and multidimensional intervention strategies.

Systematic reviews and meta-analyses have shown that bullying victimization is associated with various mental health problems including emotional distress, loneliness, anxiety, depression, suicidal ideation, and self-harm behaviors. In many cases, these effects persist beyond adolescence into adulthood (16,31,32). The findings from our study are consistent with this and demonstrate the effects of bullying on adolescents with gynecomastia. Adolescents with gynecomastia who experienced bullying exhibited higher scores on anxiety and depression subscales compared to their peers with gynecomastia who had no bullying victimization. Increases were particularly prevalent in social phobia, obsessive-compulsive symptoms, panic disorder symptoms, and depressive symptoms. Given these findings, we further suggest that bullying history should be routinely assessed during psychiatric evaluation of adolescents with gynecomastia. Evaluating bullying experiences in adolescents with gynecomastia who present with psychological symptoms is of critical importance for developing effective intervention strategies.

The literature has reported patient statements and clinical observations indicating that adolescents with gynecomastia prefer loose clothing to conceal their breasts and avoid social settings where the upper body is exposed, such as changing rooms and swimming (6,11,33). However, systematic and quantitative data regarding the prevalence of these behaviors have remained limited to date. Our study addresses this by revealing that approximately 60% of participants made changes in clothing preferences (favoring looser and more concealing garments), 44% avoided changing rooms, and 41% avoided swimming or beach activities. Therefore, our findings demonstrate that these behavioral adaptation strategies, previously mentioned only as possible outcomes, are quite prevalent and are possibly clinically significant in adolescent gynecomastia.

Previous research reports inconsistent psychological outcomes in adolescents with gynecomastia, with some studies demonstrating elevated anxiety, depression, and impaired self-esteem (10,12,34), while others found no differences (35). In our regression analysis, the absence of significant effects of age, BMI, self-esteem, and behavioral modifications on bullying victimization risk meant that gynecomastia diagnosis

was the strongest determining factor in the general sample, with anxiety-depressive symptom levels contributing as an independent risk factor. In the gynecomastia group-specific analysis, while anxiety-depressive symptom levels increased bullying risk, separation anxiety was unexpectedly identified as a protective factor (OR=0.718, p=0.033), suggesting that family closeness may have a protective effect against bullying. The literature has documented that adolescents with gynecomastia may exhibit extreme avoidance behaviors including withdrawal from social environments, peer exclusion, and even thoughts of dropping out of school due to severe bullying (9,36). Therefore, adolescents with high separation anxiety may have reduced their bullying victimization risk by avoiding social risks with the motivation to preserve the psychological safety of their family environment. The absence of significant differences in baseline anxiety, depression, and self-esteem levels between gynecomastia and control groups suggests that the pronounced psychological elevations observed in bullied adolescents with gynecomastia may be a consequence of the bullying experience.

Study Limitations

Several methodological limitations warrant consideration when interpreting these findings. The cross-sectional design prevents establishment of causal relationships between gynecomastia, psychological symptoms, and bullying experiences. While the sample size was adequate for detecting the primary outcome based on power analysis, the relatively modest sample size—which, when divided across Rohrich grades 1-4, yields small subgroups—limits generalizability and precludes definitive conclusions regarding any specific severity grade. Assessment of psychological symptoms relied exclusively on self-report measures rather than clinical diagnostic interviews, potentially compromising the depth and reliability of psychological evaluations. Single-center recruitment from a tertiary care facility may introduce selection bias, potentially overrepresenting individuals seeking medical intervention. The study did not assess detailed characteristics of bullying experiences, including frequency, duration, or specific types of victimization. Furthermore, the study did not evaluate family or school context variables, such as family support, parenting styles, teacher support, and peer relationships, which could strongly influence bullying experiences and psychological outcomes. Finally, the absence of longitudinal follow-up prevents examination of temporal relationships and long-term psychosocial outcomes.

Conclusion

This investigation demonstrated that adolescents with gynecomastia experienced significantly elevated rates of peer victimization, with prevalence reaching 34.6% compared to 16.9% in healthy controls. The 2.63-fold increased risk, particularly in dual victim-perpetrator categories, highlighted the complex bullying dynamics affecting this population. Victimized adolescents with gynecomastia showed substantial psychological burden across multiple anxiety and depressive symptom domains. These findings indicate that while gynecomastia may not invariably precipitate clinical-level psychological disorders, it imposes considerable psychosocial burden during the already challenging period of adolescence, characterized by social difficulties and avoidance behaviors. The results imply the necessity of routine bullying assessment during clinical evaluation and implementing comprehensive psychosocial screening protocols with early intervention strategies. Future studies should focus on developing and implementing school-based bullying prevention programs and evaluating the effectiveness of integrated mental health interventions for this high-risk population. Future research with larger samples across all gynecomastia severity levels and incorporating longitudinal designs will help the understanding of these psychosocial dynamics and the development of targeted intervention strategies for this vulnerable adolescent population.

Ethics

Ethics Committee Approval: The study protocol was approved by the Institutional Ethics Committee of University of Health Sciences Türkiye, Başakşehir Çam and Sakura City Hospital (approval no.: KAEK/2023.06.254, date: 2023).

Informed Consent: Written informed consent was obtained from all participants and their parents or legal guardians prior to enrollment.

Footnotes

Authorship Contributions

Surgical and Medical Practices: Zümrüt Kocabey Sütçü, Emel Hatun Aytaç Kaplan, Concept: Yasin Çalışkan, Zümrüt Kocabey Sütçü, Design: Yasin Çalışkan, Data Collection or Processing: Yasin Çalışkan, Emel Hatun Aytaç Kaplan, Analysis or Interpretation: Yasin Çalışkan, Emel Hatun Aytaç Kaplan, Literature Search: Yasin Çalışkan, Zümrüt Kocabey Sütçü, Writing: Yasin Çalışkan, Zümrüt Kocabey Sütçü, Emel Hatun Aytaç Kaplan.

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References

1. Berger O, Hornik-Lurie T, Talisman R. Pubertal gynecomastia incidence among 530,000 boys: a cross sectional population based study. Front Pediatr. 2024;12:1367550.
2. Metwalley KA, Farghaly HS. Gynecomastia in adolescent males: current understanding of its etiology, pathophysiology, diagnosis, and treatment. Ann Pediatr Endocrinol Metab. 2024;29:75-81.
3. Rohrich RJ, Ha RY, Kenkel JM, Adams WP Jr. Classification and management of gynecomastia: defining the role of ultrasound-assisted liposuction. Plast Reconstr Surg. 2003;111:909-923.
4. Ma NS, Geffner ME. Gynecomastia in prepubertal and pubertal men. Curr Opin Pediatr. 2008;20:465-470.

5. Berger O, Landau Z, Talisman R. Gynecomastia: A systematic review of pharmacological treatments. Front Pediatr. 2022;10:978311.

6. Lemaine V, Cayci C, Simmons PS, Petty P. Gynecomastia in adolescent males. Semin Plast Surg. 2013;27:56-61.

7. 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. Plast Reconstr Surg. 2013;131:890-896.

8. Lashin R, Youssef RA, Elshahat A, Mohamed EN. Postoperative psychological impact on teenagers after gynecomastia correction. Plast Reconstr Surg Glob Open. 2023;11:e5094.

9. Kinsella C Jr, Landfair A, Rottgers SA, Cray JJ, Weidman C, Deleyiannis FW, Grunwaldt L, Losee JE. The psychological burden of idiopathic adolescent gynecomastia. Plast Reconstr Surg. 2012;129:1-7.

10. Nuzzi LC, Firriolo JM, Pike CM, Cerrato FE, DiVasta AD, Labow BI. The effect of surgical treatment for gynecomastia on quality of life in adolescents. J Adolesc Health. 2018;63:759-765. Epub 2018 Sep 29

11. Rew L, Young C, Harrison T, Caridi R. A systematic review of literature on psychosocial aspects of gynecomastia in adolescents and young men. J Adolesc. 2015;43:206-212. Epub 2015 Jul 5

12. Karpinski M, Tuen YJ, Courtemanche R, Arneja JS. Quality of life measured using the BODY-Q after adolescent gynecomastia surgery: a cross-sectional analysis. Plast Surg (Oakv). 2024;33:601-608.

13. Modecki KL, Minchin J, Harbaugh AG, Guerra NG, Runions KC. Bullying prevalence across contexts: a meta-analysis measuring cyber and traditional bullying. J Adolesc Health. 2014;55:602-611. Epub 2014 Aug 25

14. Puhl RM, Lessard LM. Weight stigma in youth: prevalence, consequences, and considerations for clinical practice. Curr Obes Rep. 2020;9:402-411. Epub 2020 Oct 20

15. Low E, Monsen J, Schow L, Roberts R, Collins L, Johnson H, Hanson CL, Snell Q, Tass ES. Predicting bullying victimization among adolescents using the risk and protective factor framework: a large-scale machine learning approach. BMC Public Health. 2025;25:321.

16. Moore SE, Norman RE, Suetani S, Thomas HJ, Sly PD, Scott JG. Consequences of bullying victimization in childhood and adolescence: a systematic review and meta-analysis. World J Psychiatry. 2017;7:60-76.

17. Neyzi O, Bundak R, Gökçay G, Günöz H, Furman A, Darendeliler F, Baş F. Reference values for weight, height, head circumference, and body mass index in Turkish children. J Clin Res Pediatr Endocrinol. 2015;7:280-293.

18. Olweus D. Revised Olweus bully/victim questionnaire. Journal of Psychopathology and Behavioral Assessment [Internet]. 1996 [cited 2025 July 30]; Available from: https://psycnet.apa.org/doiLanding?doi=10.1037%2Ft09634-000

19. Sipahi HT, Karababa AO. Adoption of Olweus bully victim questionnaire to Turkish and Turkey and analysis of its validity and reliability. Ege Journal of Medicine. 2018;57:222-227.

20. Rosenberg M. Rosenberg self-esteem scale. J Relig Health. 1965.

21. Çuhadaroğlu F. Adölesanlarda benlik saygısı. [Ankara]: Hacettepe University; 1986.

22. Chorpita BF, Moffitt CE, Gray J. Psychometric properties of the revised child anxiety and depression scale in a clinical sample. Behav Res Ther. 2005;43:309-322.

23. Gormez V, Kılınçaslan A, Orengul AC, Ebesutani C, Kaya I, Ceri V, Nasıroğlu S, Chorpita Bruce MF. Psychometric properties of the Turkish version of the revised child anxiety and depression scale - child version in a clinical sample. Psychiatry and Clinical Psychopharmacology. 2017;27:84-92.

24. Myers TA, Crowther JH. Social comparison as a predictor of body dissatisfaction: a meta-analytic review. J Abnorm Psychol. 2009;118:683-698.

25. van Geel M, Vedder P, Tanilon J. Are overweight and obese youths more often bullied by their peers? A meta-analysis on the correlation between weight status and bullying. Int J Obes (Lond). 2014;37:1263-1267. Epub 2014 Jul 8

26. Webb HJ, Zimmer-Gembeck MJ. The role of friends and peers in adolescent body dissatisfaction: a review and critique of 15 years of research. J Res Adolesc. 2014;24:564-590.

27. Anderson M, Faverio M, Gottfried J. Teens, social media and technology 2023. Pew Research Center. 2023.

28. Mercan Isik C, Ozturk M, Bestas A. Gynecomastia and adolescence: psychological effects of social appearance anxiety and peer bullying. J Pediatr Nurs. 2025;83:23-29. Epub 2025 Apr 24

29. Reijntjes A, Kamphuis JH, Prinzie P, Telch MJ. Peer victimization and internalizing problems in children: a meta-analysis of longitudinal studies. Child Abuse Negl. 2010;34:244-252. Epub 2010 Mar 20

30. Cook CR, Williams KR, Guerra NG, Kim TE, Sadek S. Predictors of bullying and victimization in childhood and adolescence: a meta-analytic investigation. School Psychology Quarterly. 2010;25:65-83.

31. Ariani TA, Putri AR, Firdausi FA, Aini N. Global prevalence and psychological impact of bullying among children and adolescents: a meta-analysis. J Affect Disord. 2025;385:119446. Epub 2025 May 18

32. López-Castro L, Smith PK, Robinson S, Görzig A. Age differences in bullying victimisation and perpetration: evidence from cross-cultural surveys. Aggress. Violent Behav. 2023;73:101888.

33. Crerand CE, Magee L. Cosmetic and reconstructive breast surgery in adolescents: psychological, ethical, and legal considerations. Semin Plast Surg. 2013;27:72-78.

34. Arslan SC, Esin IS, Cayır A, Orbak Z, Dursun OB. The relationship between psychopathology, self-esteem, body perception and serum sex steroids in pubertal gynecomastia. Clin Psychopharmacol Neurosci. 2021;19:498-506.

35. Meral Y, Sezgin M, Özer Y. Psychological resilience, body appreciation, and associations with anxiety and depression in pubertal gynecomastia: a case-controlled study. Neuropsychiatr Invest. 2025;63:1-9.

36. Kasielska A, Antoszewski B. Effect of operative treatment on psychosocial problems of men with gynaecomastia. Pol Przegl Chir. 2011;83:614-621.