The relationship between body image, self-esteem, and body mass index in primary school children

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ABSTRACT

Objective: With the increasing prevalence of childhood obesity, there is a growing interest in understanding how the ideal body image influence children's self-perception and whether this may potentially lead to various psychological problems. Therefore, this study aimed to examine the relationship between body image, self-esteem, and Body Mass Index (BMI) in primary school children, to identify individuals at risk at an early stage.

Material and Methods: The study sample consisted of 342 primary school children aged 6-12 years. The Sociodemographic Information, Children's Body Image Scale (CBIS) and Children's Rosenberg Self-Esteem Scale (CRSS) were used to gather data. Body weight and height were measured, and BMI was calculated. Data were analyzed using Chi-square, Mann–Whitney U, Kruskal–Wallis, Spearman correlation, and multiple linear regression tests.

Results: BMI was moderately associated with perceived body image ($r = 0.428$; $p < 0.001$) and body dissatisfaction ($r = 0.422$; $p < 0.001$) but showed minimal correlation with self-esteem and age (CRSS: $r = 0.011$, $p > 0.050$; NSE: $r = 0.002$, $p > 0.050$; PSE: $r = 0.014$, $p > 0.050$; Age: $r = 0.032$, $p > 0.050$), while self-esteem measures did not significantly differ by body satisfaction status (CRSS: $H = 0.599$, $p = 0.741$; NSE: $H = 0.293$, $p = 0.864$; PSE: $H = 0.950$, $p = 0.622$). Regression analysis identified BMI ($B = 0.094$; 95% CI: 0.071–0.116; $\beta = 0.411$; $p < 0.001$) as the strongest predictor of body dissatisfaction, followed by age ($B = 0.078$; 95% CI: 0.006–0.150; $\beta = 0.106$; $p = 0.035$), whereas other sociodemographic and psychological variables, including gender ($B = 0.199$; $p = 0.122$) and self-esteem (NSE: $B = -0.022$, $p = 0.368$; PSE: $B = 0.023$, $p = 0.469$), did not significantly predict dissatisfaction levels.

Conclusion: BMI has a significant influence on body image perception in primary school-aged children, whereas self-esteem appears to be less affected by body satisfaction at this developmental stage. These results highlight the need for early, gender-sensitive, and family-centered interventions to promote healthy body image.

Keywords: Body image, children, self esteem

Introduction

Self-views are conceptualized under the construct of self-perception, which emphasizes the reciprocal interaction among psychological, sociological, and physiological factors. According to Demoulin, self-perception encompasses the emotional synthesis of all positive and negative experiences and information that an individual accumulates throughout life and is composed of two subdimensions: self-efficacy and self-esteem (1). Demoulin, defines self-efficacy as one's motivation, confidence in facing challenges, and sensitivity to stress, whereas self-esteem pertains to evaluative perceptions of personally meaningful aspects of life (2). Body image, defined as the mental representation of one's physical appearance, involves an individual's perceptions, thoughts, and feelings about their own body (3). It consists of a perceptual component-the accuracy of body size and shape estimation-and an attitudinal component-emotional responses associated with that perception (4). This construct develops from infancy through interactions with caregivers and becomes a central part of self-concept formation (5). Childhood, particularly the primary school years, represents a critical stage for physical, emotional, and cognitive development (6). During this period, children become increasingly aware of their bodies, engage in social comparisons, and begin to establish stable self-perceptions. Self-esteem, reflecting one's overall sense of worth, is closely linked with body image; negative body

perceptions are associated with lower self-esteem, whereas positive body image serves as a protective factor for mental well-being (7,8). Recent research has demonstrated that body-image concerns are not exclusive to adolescence and adulthood but may emerge as early as six years of age (9). Such concerns can be shaped by factors including media influence, peer relationships, and family attitudes (10). Moreover, body dissatisfaction during childhood has been linked prospectively to lower self-esteem, disordered eating behaviors, and psychological distress in later life (11). As children reach school age, they begin to recognize the concepts of evaluation and being evaluated, and start to perceive the ideal body image based on societal standards. They become aware of the societal bias against individuals with obesity through increased interactions with peers at school and through media influence (12). Over the past 30 years, the prevalence of obesity among children and adolescents has been rising globally. One of the main contributors to this increase is the decline in physical activity and the deterioration of dietary habits and food preferences due to technological advancements. In later stages of life, obesity becomes a significant public health issue, triggering numerous chronic, metabolic, and psychological health problems, and placing a substantial burden on national healthcare systems (13). Moreover, childhood obesity not only poses physical health risks but also leads to psychological complications and adverse outcomes. It may result in social isolation and behavioral problems among children (14). In this context, Body Mass Index (BMI) plays a dual role. It is not only an indicator of physical health but also a factor influencing how children perceive themselves. In societies where thinness is idealized, overweight and obese children are more likely to experience body dissatisfaction and lower levels of self-esteem (15). Despite the growing awareness of these issues, research examining the interaction between body image, self-esteem, and BMI in early childhood remains limited. Understanding these relationships in primary school-aged children is crucial for identifying at-risk individuals at an early stage and for developing effective interventions. Therefore, the aim of this study was to investigate the relationship between body image, self-esteem levels, and BMI status in primary school children.

Materials and Methods

Sampling and Study Design: The study was conducted with 342 participants throughout the province of Kastamonu between July 2024 and June 2025. Participants were selected using simple random sampling from among students aged between 6 and 12 years from both genders enrolled in formal education in schools. Students were randomly invited, and only those who volunteered with parental consent were included. Because the study was intended to be representative of the general student population, no specific exclusion criteria were applied. This is a non-experimental, descriptive, and cross-sectional study

that presents quantitative data. The data were collected by the researchers through face-to-face interviews using a structured questionnaire. The questionnaire included items on sociodemographic characteristics, body image, self-esteem, and anthropometric measurements. For anthropometric measurements, participants' body weight and height were measured, and BMI values were calculated to classify their anthropometric status. To assess body image, the Children's Body Image Scale (CBIS) was used. To evaluate self-esteem, the Children's Rosenberg Self-Esteem Scale (CRSS) was administered.

Anthropometric Measurements: Body weight and height were measured Weight was assessed to the nearest 0.1 kg using a calibrated digital scale (SECA 813, SECA GmbH & Co. KG, Hamburg, Germany), and height was measured to the nearest 0.1 cm using a portable stadiometer (SECA 213, SECA GmbH & Co. KG, Hamburg, Germany). Measurements were taken twice, and the mean value was used for analysis.

Body Image: Body image was assessed using the CBIS developed by Truby and Paxton (16). The Turkish version of the scale was validated and its reliability confirmed by Akliman et al. in (17). Body dissatisfaction score (BDS) was calculated using the formula: CBIS Score = Perceived Body Size – Ideal Body Size

In this scoring system, negative values indicate a desire to be heavier, positive values indicate a desire to be thinner, and a score of zero indicates satisfaction with body size.

Self-Esteem: Self-esteem was assessed using the CRSS, adapted to children by Wood et al. (18). It consists of 10 items, including 5 negatively worded items, and aims to measure levels of self-esteem in children. Each item is rated on a 4-point Likert scale. When negative items are reverse-coded, total scores range from 10 to 40, with higher scores indicating higher levels of self-esteem. The Turkish validity and reliability study was conducted by Gökdemir and Ekşi (19). This scale has two sub-dimensions: positive self-esteem (PSE) and negative self-esteem (NSE).

Statistical analysis:

All data entry, analysis, and interpretation were conducted using the IBM SPSS Statistics Version 25 software package. Descriptive statistics were presented using frequency tables. For categorical variables, data were presented as number (n) and percentage (%). For continuous variables, data were presented as median, minimum, and maximum values. The Kruskal-Wallis test was used to compare age, BMI, and CRSS (total and subdimensions) across body satisfaction groups. Post-hoc pairwise comparisons were performed using Dunn's test with Bonferroni correction to adjust for multiple comparisons following significant Kruskal–Wallis results. The general characteristics of the participants were evaluated using the Mann Whitney U test. To determine which variables influenced body satisfaction status, a Multiple Linear Regression analysis was performed. Prior to

regression analysis, assumptions of normality, linearity, and homoscedasticity were examined using histograms, Q-Q plots, and residual plots. The Shapiro–Wilk test indicated that the distribution of BDS deviated from normality (p < 0.001). The Spearman correlation test was used to examine the correlation between age, BMI, CRSS (total and subdimensions), and the CBIS. A p-value < 0.050 was considered statistically significant. In addition to p-values, effect sizes (η^2 for Kruskal–Wallis tests, rank-biserial r for pairwise Mann–Whitney U comparisons, Cramér's V for chi-square analyses and standardized β for regression analyses) with 95% confidence intervals were calculated to assess the magnitude and clinical relevance of the findings.

Results

The general characteristics of the participants are presented in Table I. The study included a total of 342 primary school children, with 178 (52%) females and 164 (48%) males. The median age was 9 years for boys (range: 6–12) and 8 years for girls (range: 6–12), with no significant difference between genders. The median BMI was significantly higher among boys compared to girls. The median CRSS scores did not differ significantly between genders. The gender difference in BMI was significant (p=0.025) with a small-to-moderate effect size (rank-biserial r=0.130, 95% CI [0.02–0.23]), while differences in age and CRSS were negligible (r<0.100). When parental occupations were evaluated, most mothers were unemployed. Although a higher proportion of boys had mothers who were civil servants or teachers, and more girls had mothers who were workers, Similarly, the most common occupation among fathers was worker, followed by civil servant and tradesman, with no significant gender-related differences. The majority of the children were either first or second born in their families. Birth order distribution showed no significant gender differences. Regarding body

Table I: General characteristics of participants					
	Female	Male	Total	p	Effect size (95% CI)
Number of patiens	178	164	342	-	-
Age*	8 (6 - 12)	9 (6-12)	9 (6-12)	0.702†	0.03 (ns)‡
BMI*	26 (14.8-44.9)	26.7 (14.3-50.9)	26.6 (14.3-50.9)	0.025†	0.12 (0.02–0.22)‡
CRSS *	30 (20-40)	31 (19-40)	30 (19-40)	0.079†	0.09 (ns)
Mother's occupation§					
Unemployed	106 (50.5)	104 (49.5)	210 (61.4)		
Worker	40 (67.8)	19 (32.2)	59 (17.3)		
Healthcare workers	11 (55)	9 (45)	20 (5.8)	0.069‖	0.10¶
Tradesman	8 (47.1)	9 (52.9)	17 (5)		
Civil servant	5 (33.3)	10 (66.7)	15 (4.4)		
Teacher	8 (38.1)	13 (61.9)	21 (6.1)		
Father's occupation§					
Unemployed	5 (38.5)	8 (61.5)	13 (3.8)		
Worker	105 (54.7)	87 (45.3)	192 (56.1)		
Healthcare workers	3 (20)	12 (80)	15 (4.4)	0.109‖	0.09¶
Tradesman	31 (57.4)	23 (42.6)	54 (15.8)		
Civil servant	31 (49.2)	32 (50.8)	63 (18.4)		
Teacher	3 (60)	2 (40)	5 (1.5)		
Number of children§					
Only child	20 (52.6)	18 (47.4)	38 (11.1)		
2 children	80 (49.4)	82 (50.6)	162 (47.4)		
3 children	56 (57.7)	41 (42.3)	97 (28.4)	0.792‖	0.05 ¶
4 children	17 (48.6)	18 (51.4)	35 (10.2)		
5 or more children	5 (50)	5 (50)	10 (2.9)		
Birth Order§					
First child	76 (46.9)	86 (53.1)	162 (47.4)		
Second child	65 (59.6)	44 (40.4)	109 (31.9)		
Third child	33 (55.9)	26 (44.1)	59 (17.3)	0.119‖	0.08¶
Fourth child	4 (40)	6 (60)	10 (2.9)		
Fifth or later	0 (0)	2 (100)	2 (0.6)		
Body Satisfaction Status§					
Desire to be thinner	94 (55.3)	76 (44.7)	170 (49.7)		
Satisfied	39 (36.4)	68 (63.6)	107 (31.3)	<0.001‖	0.14¶
Desire to be heavier	45 (69.2)	20 (30.8)	65 (19)		

*: median (min-max), †: Mann Whitney U test, §: n (%), ‖: Chi-square test, ¶: v, **BMI**: Body Mass Index, **CRSS**: Children's Rosenberg Self-Esteem Scale, p < 0.050, **ns**: not significant

Table II: Comparison of age, BMI, and CRSS (Total and Dimensions) according to body satisfaction status					
	Desire to be thinner*	Satisfied*	Desire to be heavier*	Test stat.	p[†]	η² (95% CI)
Age	9 (6-12)	8 (6-12)	8 (6 - 12)	4.607	0.100	< 0.01
BMI	29.3 (14.3 - 50.9)[a]	25.8 (15.6-37)[b]	25.2 (14.8-43.5)[b]	49.138	<0.001	0.14 (0.09-0.18)
CRSS	31 (19-40)	30 (21-40)	30 (22 - 39)	0.599	0.741	< 0.01
NSE	14 (6-20)	14 (7 - 20)	14 (8 - 20)	0.293	0.864	< 0.01
PSE	16 (9-20)	17 (12 - 20)	16 (12 - 20)	0.950	0.622	< 0.01

*: median (min-max), [†]: Kruskal Wallis test, **BMI:** Body Mass Index, **CRSS:** Children's Rosenberg Self-Esteem Scale, **NSE:** Negative Self Esteem, **PSE:** Positive Self Esteem, [a,b]: For each measurement, there is no significant difference between groups that share the same letter (Dunn test). p < 0.050

Table III: Multiple linear regression analysis							
Predictor	B	95% CI for B	β	t	p	Zero order	Partial r
Number of Children	-0.06	(-0.242 - 0.136)	-0.042	-0.645	0.519	-0.105	-0.035
Birth order	-0.053	(-0.242 - 0.116)	-0.036	-0.550	0.583	-0.107	-0.030
BMI	0.094	(0.071 - 0.026)	0.411	8.279	0.000	0.439	0.413
NSE	-0.022	(-0.069 - 0.084)	-0.047	-0.901	0.368	-0.019	-0.049
PSE	0.023	(-0.039 - 0.15)	0.038	0.725	0.469	0.049	0.040
Age	0.078	(0.006 - 0.451)	0.106	2.118	0.035	0.126	0.115
Gender	0.199	(-0.053 - 0)	0.077	1.551	0.122	0.132	0.085

B: Unstandardized Coefficient, **Beta:** Standardized Coefficient, **Adj. R²:** 0.199, **F:** 13.089, p:<0.001, **SE:** 1.164, **BMI:** Body Mass Index, **NSE:** Negative Self Esteem, **PSE:** Positive Self Esteem

satisfaction, 49.7% of the participants expressed a desire to be thinner, 31.3% reported being satisfied with their body, and 19.0% wished to be heavier. A significant gender difference was observed: girls more frequently expressed a desire to be thinner, while boys more often reported being satisfied with their body.

The comparison of age, BMI, and CRSS total and dimension scores according to body satisfaction status is presented in Table II. A statistically significant difference was found between the groups in terms of BMI scores. Post-hoc Dunn test results indicated that children who expressed a desire to be thinner (corresponding to positive BDS values) had significantly higher BMI values compared to both children who were satisfied with their bodies (BDS=0) and those who desired to be heavier (negative BDS values). No significant difference in BMI was found between the "satisfied" and "desire to be heavier" groups. The Kruskal-Wallis test for body satisfaction status showed a large effect (η² = 0.14, 95% CI [0.09–0.18]). No statistically significant differences were observed among the body satisfaction groups in terms of age, total CRSS scores, NSE scores, or PSE scores.

Spearman's rank-order correlation analyses were conducted to examine the bivariate associations among children's perceived body image (PBI), ideal body image (IBI), BDS, BMI, total and subscale scores of the CRSS, and age. The full correlation matrix is presented in Figure 1. BMI was moderately, positively associated with PBI and with BDS. BMI showed negligible relationships with IBI and with

age, implying that weight status does not appreciably shift one's ideal body size or vary systematically across this age range. Total CRSS was essentially uncorrelated with body dissatisfaction and showed only minimal associations with PBI, BMI, and age. Age exhibited only weak, non-significant correlations with all other study variables.

A multiple linear regression are presented in Table III to examine the extent to which sociodemographic and psychological variables predict children's body dissatisfaction scores. The overall model was significant and accounted for approximately 19.9% of the variance in body dissatisfaction. Among the seven predictors, BMI emerged as the strongest predictor of body dissatisfaction, showing the highest standardized beta coefficient (β = 0.41, p < 0.001), indicating that children with higher BMI reported greater body dissatisfaction (positive BDS values reflecting a desire to be thinner). For each one-unit increase in BMI, body dissatisfaction increased by 0.094 points, holding all other variables constant. Age also had a significant but smaller effect (β = 0.11, p=0.035) such that older children reported marginally higher body dissatisfaction scores. In contrast, number of children in the family, the CRSS dimensions (NSE, PSE), birth order and gender did not significantly predict body dissatisfaction). Zero-order and partial correlations further confirmed that BMI and age were the only variables with meaningful unique contributions to the model. The model demonstrated a good overall fit (Deviance/df = 1.36).
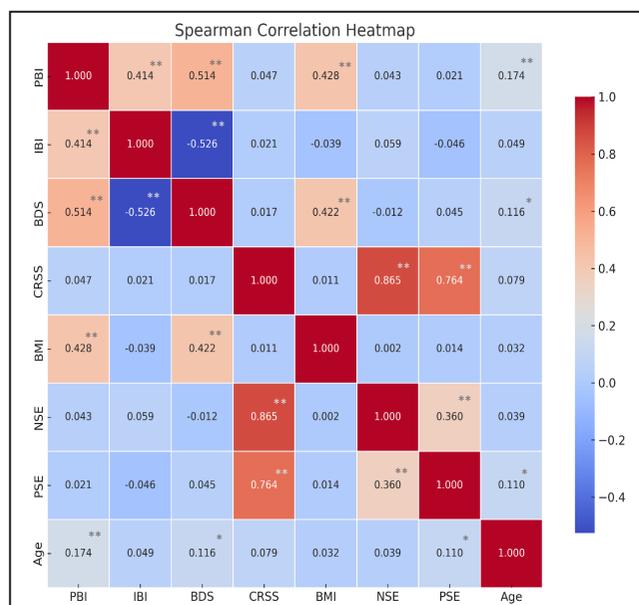
Figure 1: Age, BMI, Children's Rosenberg Self-Esteem Scale (Total and Dimensions) and Children's Body Image Scale Spearman Correlation Matrix Heatmap; Correlation coefficient range: −1 to +1; *p<0.050; **p < 0.010 (2-tailed); **BMI:** Body Mass Index, **CRSS:** Children's Rosenberg Self-Esteem Scale, ***NSE:*** Negative Self Esteem, **PSE:** Positive Self Esteem, **BDS:** Body Dissatisfaction Score, **PBI:** Perceived Body Image, **IBI:** Ideal Body Image

Discussions

BMI values differed significantly between genders, with boys exhibiting slightly higher median BMI than girls. This result is consistent with previous research suggesting that boys may have higher body weight trajectories during childhood due to differences in physical activity levels, energy expenditure, or dietary patterns (20).

No significant differences were found between girls and boys in terms of self-esteem scores (CRSS). This finding may imply that self-esteem in this age group is shaped by a broader set of factors beyond physical appearance, including familial support, academic success, and peer relationships (22). However, a clear gender pattern emerged in body satisfaction: girls more often desired to be thinner, whereas boys expressed greater satisfaction or a desire to be heavier, reflecting gender-specific social and media influences on body ideals (12,16,23).

The relationship between body satisfaction status and age, BMI, and self-esteem dimensions was examined among children and adolescents. There was no statistically significant difference in age among the three body satisfaction groups. This suggests that body satisfaction or dissatisfaction is not strongly influenced by chronological age within the 6-12 age range. In contrast, there was a statistically significant difference in BMI between groups. Positive BDS scores reflect a desire to be thinner and were indeed associated with higher BMI in our sample. Post hoc analysis revealed that children who expressed a desire to be thinner had significantly higher BMI values compared to those who were satisfied with their bodies or who desired to be heavier. The large effect of body satisfaction status indicates that the BMI differences between body satisfaction groups are not only statistically significant but also clinically meaningful. This aligns with previous findings indicating that higher BMI is a strong predictor of body dissatisfaction in children and adolescents (26,27). The observed differences suggest that body dissatisfaction in children may largely stem from perceptions of overweight, even at a young age, potentially contributing to unhealthy weight control behaviors (28). Interestingly, the total scores of the CRSS, as well as its sub-dimensions-NSE and PSE-did not significantly differ according to body satisfaction status. This finding contrasts with some literature suggesting a strong association between body image and self-esteem (29). However, other studies have noted that while body dissatisfaction can affect self-esteem, the impact may vary depending on developmental stage, cultural factors, and mediating variables such as peer and family support (6, 22). The absence of significant differences in self-esteem scores may also indicate that within this sample, body dissatisfaction has not yet generalized to broader self-worth, which may be more stable or influenced by other psychosocial factors at this developmental stage. Alternatively, the CRSS, while suitable for children, might not be sensitive enough to capture subtle emotional effects specifically related to body image in younger populations. A review of the literature reveals that the relationship between body image and self-esteem varies across age groups. This relationship appears to be strongest during adolescence, weaker in childhood, and in adulthood, it tends to be shaped by additional variables. While the current study focused on children, research specifically examining body satisfaction in this age group is limited. Therefore, interpreting findings from adolescent and adult populations to provide a broader developmental framework for interpreting the current results would be helpful in highlighting potential developmental continuities affecting body perception and satisfaction across the lifespan. Among adolescent girls in particular, failure to attain thinness ideals can lead to body dissatisfaction, which in turn may result in significant reductions in self-esteem (29, 31). In adolescent boys, a similar pressure is observed through the internalization of muscularity ideals. Body dissatisfaction during adolescence is not limited to a temporary decline in self-esteem; it can also contribute to the development of depression, eating disorders, and social anxiety (32). In young adulthood (ages 18–30), the relationship between self-esteem and body image remains significant, although it is relatively weaker compared to adolescence. This may be due to the fact that self-concept in this period is increasingly shaped by multidimensional life experiences, such as personal achievement, romantic relationships, and career development (33). Although body dissatisfaction remains a common concern within this age group, it is no longer the sole determinant of self-esteem (34).

In adulthood (age 30 and above), the relationship between body image and self-esteem becomes even more attenuated. Individuals begin to construct their self-worth beyond physical appearance, drawing from social roles, parenthood, societal contribution, and accumulated life experiences. In childhood, the relationship between body image and self-esteem is relatively weak. At this stage, self-concept is still in development, and evaluations related to body image are typically shaped by external feedback (e.g., from parents, teachers, and peers) (22). Self-esteem in this period is more strongly influenced by multiple domains such as academic success, family dynamics, and social acceptance. Therefore, dissatisfaction with body image does not necessarily lead to low self-esteem in children (9). However, especially during the transition to early adolescence (ages 11–12), with the onset of physical development and increased social comparisons, this relationship becomes more pronounced. Our findings are consistent with the existing literature on this topic.

The full correlation matrix indicates that higher adiposity co-occurs with both perceiving oneself as larger and feeling more dissatisfied with one's body.

The analysis also revealed moderate positive correlations between BMI and both PBI and BDS, reinforcing the notion that higher BMI is associated with perceiving oneself as larger and experiencing greater dissatisfaction with one's body. This relationship is well-documented across age groups highlighting the internalization of weight-related norms even among young children (11, 35).

Correlations between CRSS and body image variables were relatively weak. The association between CRSS and BDS was negligible, as was the link with PBI. Suggesting that other psychosocial factors - such as peer relationships, parental feedback, and media exposure - may play a mediating or buffering role (31).

Age was only weakly correlated with most variables, with the highest being with PBI and BDS.

The results of the multiple linear regression analysis present the predictors of body dissatisfaction, as measured by the BDS, among children. The model explains approximately 19.9% of the variance in BDS, which indicates a moderate explanatory power in psychological and behavioral research contexts (35).

Among the variables entered into the model, BMI emerged as the strongest and only highly significant predictor of body dissatisfaction. This finding reinforces the robust association between higher body mass and increased dissatisfaction with one's appearance, which is extensively supported in the literature (11,35). Children with higher BMI values likely experience greater internal and external pressures about body ideals, contributing to negative evaluations of their appearance (9). The high zero-order and partial correlations further support the strong direct effect of BMI, independent of other factors.

Age was also a statistically significant but weaker predictor. This suggests that as children grow older, they may become more aware of societal beauty norms and develop greater concern with body image (30). Although the effect size is small, it aligns with previous research indicating that body dissatisfaction tends to intensify with age, particularly as children approach adolescence (6).

In contrast, self-esteem dimensions were not significant predictors of body dissatisfaction. This result is somewhat unexpected, given that previous research has demonstrated that lower self-esteem is often linked to poorer body image (22, 31). However, the lack of significance in this sample may reflect developmental factors or the presence of other mediating variables, such as peer influence or parental attitudes (29). It is also possible that body image and self-worth operate somewhat independently during certain stages of childhood, becoming more tightly linked in later adolescence (32).

While BMI contributes to perceived body image and dissatisfaction, its effect on self-worth appears limited in this age group. These findings emphasize the need for early, developmentally appropriate interventions that target ideal body internalization and promote body acceptance without reinforcing weight-based evaluations (36).

BMI remains the most robust and consistent predictor of body dissatisfaction in childhood. The contributions of age and other psychological or demographic variables appear more nuanced and potentially mediated by external influences. These findings highlight the need for holistic, weight-neutral health education that reduces the salience of body size as a determinant of self-worth (36, 37).

This study has several limitations that should be considered when interpreting the findings. Although the regression model included key sociodemographic and psychological variables, other potential confounders that may influence body image and self-esteem were not assessed. These include socioeconomic indicators such as parental education and income level, screen time, physical activity patterns, media exposure, and experiences of peer teasing or bullying. The absence of these factors may have limited the explanatory power of the model and could partially account for the unexplained variance in body dissatisfaction scores. The cross-sectional design precludes causal inference regarding the direction of relationships among body image, BMI, and self-esteem. Longitudinal studies would be necessary to clarify whether body dissatisfaction precedes changes in self-esteem or vice versa. The data were based on self-reported measures, which may be subject to social desirability or recall bias, particularly in younger children. Finally, the study sample consisted of children from a single geographic region and relatively homogeneous socioeconomic background, which may restrict the generalizability of the results to broader or more

diverse populations. Additionally, although the CBIS was originally developed for children aged 7–12 years, a small number of 6-year-old participants were included because the official school entry age in Türkiye begins at six. These children were first-grade students who were cognitively and linguistically comparable to the lower end of the CBIS target age range. Nevertheless, this age inclusion should be considered a minor limitation when interpreting the findings.

In summary, the findings underscore the role of BMI in body image perception even among children aged 6–12, while self-esteem appears to be less directly affected by body satisfaction at this stage. These results highlight the importance of early intervention strategies focusing on healthy body image and weight perception without reinforcing weight stigma. School-based prevention programs and parent education initiatives may be effective in fostering healthier self-perceptions and body satisfaction in this age group.

Conclusion

these findings reinforce the importance of addressing body image and weight-related attitudes in primary school-aged children. The gender differences in body satisfaction and the association with BMI underline the need for gender-sensitive public health strategies and family-centered education programs. Future studies should explore the longitudinal trajectory of these variables to better understand their long-term impact on adolescent and adult health.

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