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Factors associated with body image dissatisfaction among medical students: a cross-sectional study

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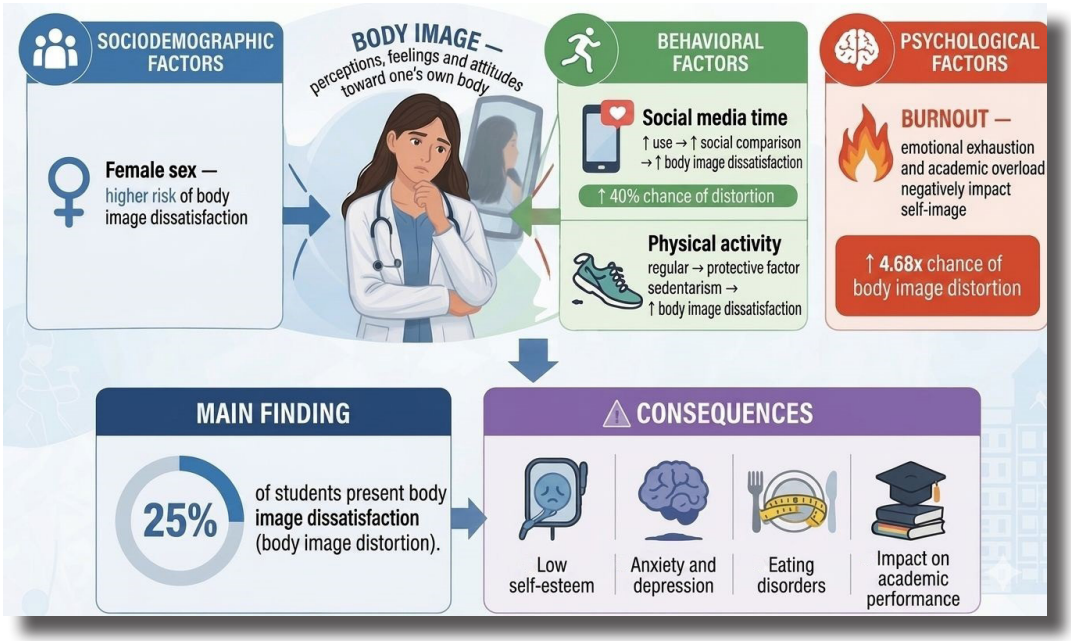
Highlights

- *Women demonstrate greater body image dissatisfaction.*
- *Excessive use of social media negatively impacts self-image.*
- *Sports practice is associated with a better body perception.*
- *The presence of burnout may worsen negative body image perception.*
- *Body image dissatisfaction may be a sign of psychological distress.*

Graphical Abstract



Prepared by the authors with the assistance of artificial intelligence (illustrative image).

Abstract

Body image is a multidimensional construct influenced by sociocultural, behavioral, and psychological factors, with body image dissatisfaction being frequent among university students, particularly medical students. This study aimed to evaluate the association between body image dissatisfaction and sociodemographic, behavioral, and psychological factors, with emphasis on social media use, physical activity practice, and burnout syndrome. This was an observational, cross-sectional, quantitative study conducted with medical students from a private institution in the interior of the state of Rio de Janeiro. Body image dissatisfaction was assessed using the Body Shape Questionnaire (BSQ) and burnout using the Burnout Syndrome Assessment Scale for University Students (ESB-eu). Descriptive and inferential analyses were performed, including chi-squared test, Student's t-test, ANOVA, multiple linear regression, and binary logistic regression, adopting a significance level of 5%. The prevalence of body image distortion was approximately 25%. Significant associations were observed between body image distortion and sex, physical activity practice, social media usage time, and burnout. In the logistic regression, greater social media usage time increased the odds of distortion by 40%, while the presence of burnout increased the odds approximately 4.68-fold. It is concluded that body image dissatisfaction was primarily associated with behavioral and psychological factors, highlighting the importance of mental health promotion strategies in the university environment.

Keywords: Medical Students. Body Image. Social Media. Physical Activity. Burnout.

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INTRODUCTION

Body image is a multidimensional construct that encompasses perceptions, feelings, and attitudes toward one's own body, being influenced by sociocultural and psychological factors[1]. Body ideals, in turn, change over time and influence body perception and satisfaction. In contemporary society, the valorization of thinness and often unattainable aesthetic standards may contribute to body image dissatisfaction and psychological distress, associating physical appearance with prestige and social status[2].

In the context of higher education, health sciences students — particularly medical students — constitute a group of greater vulnerability to alterations related to mental health and body image perception[3,4]. The intense academic routine, characterized by high workload and psychological demands, may impact self-care, self-image, and lifestyle habits. During undergraduate training, lifestyle changes such as inadequate time management, task accumulation, behavioral alterations, and compromised healthy eating habits make students more susceptible to stress and social pressures[2,5,6,7,8].

Research indicates significant prevalence rates of body image dissatisfaction among medical students. However, a relevant gender disparity is noted, with female students showing a greater tendency toward body image distortion and higher levels of dissatisfaction compared to male students[4,9]. Women frequently express greater concern about weight gain, as the stereotype of thinness has historically been associated with the beauty ideal, which increases the risk of developing eating disorders and contributes to distorted body image perception. Nevertheless, men have also shown growing concern with body image, often associated with the ideal of a more muscular body, which may lead to excessive exercise practice and body image-related risk behaviors[10,11].

Beyond gender, nutritional status and behavioral factors, such as social media use and adherence to restrictive diets, exert influence on body perception[5,12]. With the digital era, media influence on body image has intensified. Social media platforms such as Facebook, Instagram, and TikTok are daily flooded with content from digital influencers targeting younger audiences, promoting images of perfect and productive personas, fitness routines and tips — often fantastical — that reach thousands of followers who aspire to replicate them[11].

Understanding the interaction among these multiple factors is essential for designing interventions that promote the mental health of future medical professionals[2]. Given the importance of identifying predisposing elements to body image and eating disorders in this population, it is necessary to investigate the correlations involved in order to support preventive actions[3,5]. In light of the above, the present study aimed to evaluate the association between body image dissatisfaction and sociodemographic, behavioral, and psychological factors, with emphasis on social media use, physical activity practice, and burnout syndrome, among medical students.

METHODS

This was an observational, cross-sectional, quantitative study conducted with medical students from a private institution in the interior of the state of Rio de Janeiro.

Initially, 513 medical students participated in the study, corresponding to 67.59% of the total number of students enrolled in the program (n = 759). A total of 68 students were excluded due to incomplete data, resulting in a final sample of 445 students included in the analyses.

Data collection was conducted between October and November 2024, encompassing students from all semesters of the program. Of the total participants, 38 were enrolled in the 1st semester, 31 in the 2nd, 39 in the 3rd, 37 in the 4th, 60 in the 5th module, 55 in the 6th module, 29 in the 7th module, 48 in the 8th module, 38 in the 9th module, 11 in the 10th module, 32 in the 11th module, and 27 in the 12th module.

Data were collected using printed forms, with direct contact with students in the classroom. After receiving the appropriate instructions, participants signed the Free and Informed Consent Form and individually completed the questionnaire, ensuring the confidentiality of the information and the impossibility of personal identification. The study was approved by the Human Research Ethics Committee of the Centro Universitário de Volta Redonda under Opinion No. 7.126.882 and CAAE 83422324.0.0000.5237.

A sociodemographic questionnaire containing basic data for sample characterization, and the Body Shape Questionnaire (BSQ), were used. The BSQ is a unidimensional questionnaire composed

of 34 items, developed by Cooper *et al.*[13], and translated, adapted, and validated for use in Brazil by Di Pietro and Silveira[9] and revalidated by Casiraghi *et al.*[14], presenting good validity indices for this population. The total BSQ score was obtained by summing the 34 items, ranging from 34 to 204 points. Results were categorized according to the following cutoff points: ≤110 (no distortion), >110 and ≤138 (mild distortion), >138 and ≤167 (moderate distortion), and >168 (severe distortion). For some analyses, absence of distortion was defined as a score ≤110 and presence of distortion as >110.

Burnout syndrome was assessed using the Burnout Syndrome Assessment Scale for University Students (ESB-eu), comprising items that evaluate emotional and physical exhaustion, disengagement, and professional efficacy. Response options range from 0 (never) to 4 (very frequently). The presence of burnout syndrome was defined based on the ESB-eu cutoff point, with a total score greater than 20 indicating burnout, as proposed by Carlotto and Câmara[15].

Data were analyzed using descriptive and inferential statistics. Categorical variables were presented as absolute and relative frequencies, and numerical variables as mean and standard deviation. Initially, descriptive analysis of the variables was performed. The Student's t-test was used to compare means between two independent groups, and analysis of variance (ANOVA) for comparisons among three or more groups. The association between categorical variables was assessed using Pearson's chi-squared test.

To evaluate the factors associated with the body image score, multiple linear regression was performed, considering the total BSQ score as the dependent variable and the variables sex, age, work status, sports practice, social media usage time, and ESB-eu score as independent variables. Model fit was assessed using the coefficient of determination (R^2) and analysis of variance (ANOVA). Beta coefficients (β) and 95% confidence intervals were estimated.

To analyze the factors associated with body image distortion, multivariate binary logistic regression was performed, with calculation of the Odds Ratio (OR) and respective 95% confidence intervals. Model fit was assessed using the Hosmer–Lemeshow test and Nagelkerke's coefficient of determination (R^2).

All statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS), version 31.0, adopting a significance level of 5% ($p < 0.05$).

RESULTS

Regarding sociodemographic characteristics (Table 1), a higher frequency of students between 30 and 39 years of age was observed (54.4%), with a predominance of female students (60.4%). The majority of participants were exclusively dedicated to studying (85.2%), were single (90.3%), had no children (92.8%), and lived with their families (62.2%). Furthermore, 60.4% of students came from the city in which the institution is located.

With respect to health conditions, 48.5% reported a family history of disease and 23.1% reported having a chronic or genetic disease. Regarding lifestyle, 26.3% of students practiced sports three to four times per week, while 22.2% did not engage in physical activity. As for social media usage time, the highest frequency of use was between one and three hours per day (39.6%), followed by three to five hours (33.0%) and more than five hours (23.1%) (Table 1).

Body image assessment demonstrated that the majority of students showed no body image distortion (74.6%). Among students who showed some degree of distortion, 12.4% showed mild distortion, 8.8% moderate distortion, and 4.3% severe distortion. Considering all levels of distortion, the total prevalence of body image distortion was 25.4% in the studied sample (Table 2).

A significant association was observed between body image distortion and sex, with distortion being more frequent in female students (31.6%) compared to male students (15.9%) ($p < 0.001$). Regarding sports practice, a significant association with body image distortion was found ($p = 0.035$), with higher frequencies of distortion among students who engaged in physical activity less frequently or did not practice at all. A significant association was also observed between social media usage time and body image distortion ($p < 0.001$), with students reporting greater usage time showing higher frequencies of distortion. A significant association was found between burnout and body image distortion ($p < 0.001$), with distortion being more frequent among students with burnout (42.7%) compared to those without burnout (12.4%), as shown in Table 3.

Table 1 - Sociodemographic, health, and lifestyle characterization of medical students in the city of Volta Redonda.

	Variable	Frequency	Percentage
Age	< 30 years	175	39.3
	30–39 years	242	54.4
	40–49 years	22	4.9
	≥50 years	6	1.4
Sex	Male	176	39.6
	Female	269	60.4
Study/Work status	Studies only	379	85.2
	Studies and works	66	14.8
Marital status	Single	402	90.3
	Married	38	8.5
	Divorced	4	0.9
	Widowed	1	0.2
Children	Yes	32	7.2
	No	413	92.8
Living arrangements	Alone	91	20.4
	With family	277	62.2
	Shared house	18	4.0
	Boarding house	3	0.7
	Shared accommodation	56	12.6
Origin	City of the higher education institution	269	60.4
	Another city	131	29.4
	Another state	42	10.1
Family history of disease	Yes	216	48.5
	No	221	49.7
	Prefer not to say	8	1.8
Chronic or genetic disease	Yes	103	23.1
	No	335	75.3
	Prefer not to say	7	1.6
Sports practice	Daily	93	20.9
	Except weekends	72	16.2
	3–4 times per week	117	26.3
	1–2 times per week	64	14.4
	Does not practice	99	22.2
Social media usage time	<1h	19	4.3
	De 1-3h	176	39.6
	De 3-5h	147	33.0
	>5h	103	23.1

Table 2 - Classification of body image distortion in medical students in the city of Volta Redonda according to the Body Shape Questionnaire (BSQ).

	Body image distortion	Frequency	Percentage
Body image distortion	None	332	74.6
	Mild	55	12.4
	Moderate	39	8.8
	Severe	19	4.2
	Total	445	100.0

Table 3 - Association between body image distortion and associated variables among medical students in the city of Volta Redonda.

	BSQ		
Variable	**Without distortion n (%)**	**With distortion n (%)**	**p**
Sex			
Male	148 (84.1)	28 (15.9)	**<0.001**
Female	184 (68.4)	85 (31.6)	
Sports practice			
Daily	74 (79.6)	19 (20.4)	**0.035**
Except weekends	61 (84.7)	11 (15.3)	
3–4x/week	88 (75.2)	29 (24.8)	
1–2x/week	42 (65.6)	22 (34.4)	
Does not practice	67 (67.7)	32 (32.3)	
Social media usage time			
<1h	17 (89.5)	2 (10.5)	**<0.001**
1–3h	147 (83.5)	29 (16.5)	
3–5h	101 (68.7)	46 (31.3)	
>5h	67 (65.0)	36 (35.0)	
Burnout			
Absent	220 (87.6)	31 (12.4)	**<0.001**
Present	110 (57.3)	82 (42.7)	

Multiple linear regression demonstrated that the model was statistically significant (F = 19.003; p < 0.001), explaining 23.3% of the variance in the body image score (R^2 = 0.233; adjusted R^2 = 0.221). The regression demonstrated that female sex, sports practice, social media usage time, and the presence of burnout were associated with a higher body image dissatisfaction score. Female sex was associated with a mean increase of 15.56 points in the BSQ score compared to male sex (95%CI: 8.73–22.39; p < 0.001). Sports practice was associated with an increase of 2.72 points in the BSQ score (95%CI: 0.36–5.09; p = 0.024), while greater social media usage time was associated with an increase of 5.68 points in the score (95%CI: 1.87–9.50; p = 0.004). The presence of burnout showed a strong association with the body image score, increasing the BSQ score by a mean of 25.85 points (95%CI: 19.30–32.40; p < 0.01). Age and work status did not show statistically significant associations with the BSQ score (Table 4).

Multivariate binary logistic regression demonstrated that the model was statistically significant (chi-squared = 77.908; p < 0.001), with an explanatory capacity of 23.7% (Nagelkerke's R^2 = 0.237) and adequate fit (Hosmer–Lemeshow test, p = 0.556). The model demonstrated an overall accuracy of 75.3% in classifying individuals. Sex, social media usage time, and the presence of burnout remained associated with body image distortion. Female sex was approximately twice as likely to present body image distortion (OR = 1.97; 95%CI: 1.16–3.34; p = 0.013). Greater social media usage time increased the odds of distortion by 40% (OR = 1.40; 95%CI: 1.06–1.85; p = 0.017). The presence of burnout was the most strongly associated factor, increasing the odds of body image distortion approximately 4.7-fold (OR = 4.68; 95%CI: 2.87–7.62; p < 0.001). Age, sports practice, and work status did not show significant associations with the outcome (Table 5).

Table 4 - Multiple linear regression analysis with body image distortion (BSQ) as the dependent variable among medical students in the municipality of Volta Redonda.

Variable	**β**	**95%CI**	**p**
Sex	15.56	8.73 – 22.39	<0.001
Age	-2.59	-7.80 – 2.61	2.61
Studies and works	-1.09	-10.54 – 8.35	0.820
Sports practice	2.72	0.36 – 5.09	0.024
Social media usage time	5.68	1.87 – 9.50	0.004
Burnout	25.85	19.30 – 32.40	<0.01

Table 5 - Multivariate binary logistic regression analysis for body image distortion (BSQ) and independent factors among medical students in the municipality of Volta Redonda.

Variable	Odds Ratio	95%CI	p
Age	0.86	0.57 – 1.28	0.460
Sex	1.97	1.16 – 3.34	0.013
Studies and works	0.77	0.37 – 1.62	0.497
Sports practice	1.19	0.99 – 1.42	0.054
Social media usage time	1.40	1.06 – 1.85	0.017
Burnout	4.68	2.87 – 7.62	<0.001

DISCUSSION

The prevalence of body image distortion found in this study was approximately 25%, indicating that approximately one in four students presented some degree of body image dissatisfaction. Bosi *et al.*[3] identified a prevalence of 27.7% of body image distortion, a value close to that found in this study. Similarly, Santos[4] observed that 26.3% of medical students presented some level of body image dissatisfaction, as well as greater dissatisfaction among women and a predominant desire to have a body mass index lower than their actual one, evidencing the pursuit of a slimmer body in this population. In contrast, Boclin *et al.*[16] identified a prevalence of approximately 50% of body image dissatisfaction among medical and dentistry students, indicating that prevalence may vary across different populations and academic contexts, but remains elevated among health sciences students.

The presence of body image distortion in this population is a relevant finding, as body image dissatisfaction is associated with negative outcomes such as low self-esteem, eating disorders, anxiety, and depression. A higher prevalence of body image distortion was observed in female students, a result widely described in the literature[2,16]. This body image distortion in the female population rarely manifests as an isolated condition. Excessive concern with body shape and the feeling of "feeling fat" generate a negative cognitive bias that may compromise social interactions and academic performance, exacerbated by the exhausting workload and the competitive academic environment[2].

This finding may be explained by the greater sociocultural and media pressure related to the female body, which has historically been more exposed to idealized aesthetic standards and greater social demands regarding appearance. This trend is consistent with several studies indicating that women, from early ages, are subjected to greater sociocultural pressure to conform to idealized body standards — frequently centered on thinness as synonymous with beauty, success, and acceptance[1,10]. This historical and media-driven construction of the "ideal" female body, often unattainable, contributes to feelings of inadequacy, low self-esteem, and body image dissatisfaction[2]. In this context, international studies reinforce this relationship, such as that conducted with university students in the United Kingdom, which demonstrated greater body image dissatisfaction among women, associated with depressive symptoms, academic stress, and sedentary behavior, while among men dissatisfaction was related to increasing age and poorer quality of life[17].

Social media usage time showed a significant association with body image distortion and with the body image dissatisfaction score. This result may be explained by Social Comparison Theory, which postulates that individuals have an intrinsic tendency to evaluate their own abilities and opinions through comparison with others, particularly when exposed to images of idealized bodies[18].

Furthermore, frequent exposure to content related to physical appearance may favor the internalization of idealized body standards, contributing to greater chronic body image dissatisfaction. The architecture of social media facilitates online social comparison by providing constant access to idealized images and lifestyles, which may lead to the objectification of image and experience. This behavior is driven by needs for belonging and self-affirmation, frequently resulting in what is defined as conspicuous online consumption[19].

Physical activity practice was also associated with body image. A higher frequency of distortion was observed among students who practiced physical activity less frequently or who did not practice sports at all. These data suggest that physical activity may act as a protective factor, promoting greater self-esteem and body satisfaction and contributing positively to body image perception. An additional possible explanation is that individuals who engage

in regular physical activity — often motivated by aesthetic concerns — achieve results that increase their satisfaction with their own image. This effect may be partially explained by psychobiological mechanisms described in the literature, such as endorphin release, improved self-esteem and sense of well-being, and reduction of depressive and anxiety symptoms[4,8]. Moreover, regular physical activity is recognized as a relevant non-pharmacological intervention in mental health management, acting through integrated physiological and psychological mechanisms[20].

Burnout was the factor most strongly associated with body image distortion and with the body image dissatisfaction score. This result suggests that psychological factors, such as chronic stress, emotional exhaustion, and academic overload, may influence body image perception. Medical students are considered an at-risk group for burnout due to the high workload, performance pressure, sleep deprivation, and highly competitive environment — factors that may contribute to alterations in self-esteem and self-image[21,22]. Early identification of at-risk groups is essential to prevent negative impacts on students' mental health and future professional practice[23].

Age and work status did not show significant associations with body image, suggesting that behavioral and psychological factors appear to exert greater influence on body image perception than sociodemographic characteristics. This dissatisfaction may trigger low self-esteem, stress, social isolation, and depression, particularly among those who do not conform to these standards, regardless of age or nutritional status, resulting in exclusion and discrimination[2,24].

Taken together, the results of this study suggest that body image distortion in medical students is associated with psychological and behavioral factors, particularly burnout and social media use, reinforcing the importance of mental health promotion strategies and conscious social media use in the university environment. Some authors suggest that medical schools should prioritize the creation of healthier learning environments, combating mental health stigma and implementing accessible mentoring and psychological support programs. The need for curricular revisions that allow students to maintain self-care habits, such as sleep and leisure, fundamental to the preservation of mental health, is emphasized[21,22,23,25,26].

Therefore, the results of this study highlight the urgent need for institutional mental health promotion strategies and the valorization of body diversity among university students. Such actions should include accessible and continuous psychological support, educational campaigns on digital media and body standards, encouragement of regular physical activity, and the promotion of self-care and body acceptance as part of humanized medical training. These strategies not only positively impact students' individual health, but also influence their future professional practice, promoting empathy and critical awareness in patient care.

As study limitations, the cross-sectional design, which does not allow for the establishment of causality, and the conduct of the study at a single private institution, which limits the generalizability of results, should be highlighted. Another limitation concerns the absence of potentially important variables, such as body mass index, nutritional status, antidepressant use, and sleep quality, which may influence body image perception. Therefore, it is recommended that future studies include these variables and involve students from different institutions and socioeconomic contexts.

CONCLUSIONS

The results of this study demonstrated that a significant proportion of medical students showed body image distortion, with this condition being associated with behavioral and psychological factors, particularly greater social media usage time, lower physical activity practice, and the presence of burnout. These findings reinforce that body image dissatisfaction in this population is not related solely to aesthetic aspects, but also to emotional, behavioral, and academic contextual factors.

From a practical standpoint, the results indicate the need for institutional strategies aimed at promoting students' mental health and well-being, including psychological support programs, positive body image promotion initiatives, encouragement of physical activity practice, and guidance on conscious social media use.

Furthermore, the presence of body image dissatisfaction and burnout during medical training may be associated with future risks, such as the development of anxiety, depression, eating disorders, substance abuse, and impaired quality of life. These factors may impact professional training, as students with psychological distress present a higher risk of emotional exhaustion, reduced empathy, and poorer academic performance. In this regard,

early identification of at-risk students becomes essential for the prevention of mental disorders, eating disorders, and academic impairment.

Thus, it is concluded that body image distortion in medical students is associated with behavioral and psychological factors, highlighting the importance of institutional interventions and mental health promotion actions in the university environment, aimed not only at students' health, but also at the quality of medical training and future professional practice.

CRediT author statement

Conceptualization: Saron, MLG; Meirelles, LMR. Methodology: Saron, MLG; Casiraghi, B; Meirelles, LMR; Winter, VO. Validation: Casiraghi, B; Meirelles, LMR; Saron, MLG. Statistical analysis: Saron, MLG; Casiraghi, B; Meirelles, LMR. Formal analysis: Casiraghi, B; Saron, MLG. Investigation: Silva, AC; Guedes, CMC; Meirelles, LMR; Cassimiro, LM; Winter, VO. Resources: Casiraghi, B; Meirelles, LMR; Saron, MLG. Writing – original draft: Silva, AC; Meirelles, LMR; Cassimiro, LM. Writing – review & editing: Casiraghi, B; Saron, MLG. Visualization: Casiraghi, B; Meirelles, LMR; Saron, MLG. Supervision: Casiraghi, B; Saron, MLG. Project administration: Saron, MLG.

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Declaration of competing interest

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