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Relationship between body appreciation, mental health and academic stress in medical science students in Cuba

Relación entre apreciación corporal, salud mental y estrés académico en estudiantes de ciencias médicas de Cuba

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Palabras Clave:
Apreciación corporal; BAS-2; Estudiantes; GAD-7; PHQ-9; Salud mental.

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RESUMEN

Introducción: La formación médica impone exigencias que comprometen la salud mental. La apreciación corporal emerge como un constructo protector poco explorado en contextos de educación médica con enfoque social. **Objetivo:** Evaluar la relación entre apreciación corporal, salud mental y estrés académico en estudiantes de ciencias médicas de Cuba. **Métodos:** Se realizó un estudio observacional, analítico y transversal en 250 estudiantes de 15 universidades médicas cubanas (septiembre de 2025). Se emplearon instrumentos validados: Body Appreciation Scale-2 (BAS-2), Generalized Anxiety Disorder-7 (GAD-7), Patient Health Questionnaire-9 (PHQ-9) y una escala de estrés académico percibido. El análisis incluyó estadística no paramétrica (U de Mann-Whitney, Kruskal-Wallis) y correlaciones de Spearman (ρ). **Resultados:** Se observó una elevada apreciación corporal (21,5 ± 3,7) y niveles de sintomatología subclínica (Ansiedad: 6,9 ± 4,6; Depresión: 6,4 ± 5,3). No se hallaron diferencias significativas por género (p=0,439) ni por año de estudio (p=0,835). La apreciación corporal mostró correlaciones inversas significativas con ansiedad (ρ=-0,273), depresión (ρ=-0,334) y estrés académico (ρ=-0,229) (p<0,001). No se encontró asociación con el Índice de Masa Corporal (p=0,913). **Conclusiones:** La apreciación corporal en estudiantes de la salud cubanos es alta y actúa como un recurso psicológico resiliente. La formación médica cubana parece atenuar las brechas de género en la percepción corporal. Se recomienda integrar el fortalecimiento de la imagen corporal positiva en los programas de bienestar estudiantil para mitigar el estrés académico.

ABSTRACT

Introduction: Medical training imposes demands that compromise mental health. Body appreciation emerges as a protective construct that is underexplored in socially focused medical education contexts. **Objective:** To evaluate the relationship between body appreciation, mental health, and academic stress in Cuban medical students. **Methods:** An observational, analytical, and cross-sectional study was conducted with 250 students from 15 Cuban medical universities (September 2025). Validated instruments were used: Body Appreciation Scale-2 (BAS-2), Generalized Anxiety Disorder-7 (GAD-7), Patient Health Questionnaire-9 (PHQ-9), and a perceived academic stress scale. The analysis included non-parametric statistics (Mann-Whitney U test, Kruskal-Wallis test) and Spearman's rank correlation coefficient (ρ). **Results:** High body image (21.5 ± 3.7) and levels of subclinical symptoms (Anxiety: 6.9 ± 4.6; Depression: 6.4 ± 5.3) were observed. No significant differences were found by gender (p=0.439) or year of study (p=0.835). Body image showed significant inverse correlations with anxiety (ρ=-0.273), depression (ρ=-0.334), and academic stress (ρ=-0.229) (p<0.001). No association was found with Body Mass Index (p=0.913). **Conclusions:** Body image among Cuban health sciences students is high and acts as a resilient psychological resource. Cuban medical training appears to mitigate gender gaps in body perception. It is recommended that strengthening positive body image be integrated into student wellness programs to mitigate academic stress.

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MedEst. 2026| Vol. 6: e469
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INTRODUCTION

Medical science training is globally recognized as one of the most demanding academic paths, severely impacting students' psychological well-being. The mental health of university students constitutes a public health priority due to its influence on academic performance, student retention, and overall well-being. [1]

An exhaustive review conducted by Nunes et al. [2] identified high rates of depressive symptoms, anxiety, and suicidal ideation in this population, associated with heterogeneous factors including health conditions, sociodemographic variables, family relationships, and specific academic aspects. Health science students face particularities that increase their vulnerability to mental health problems, as they combine intense academic demands, early contact with emotionally demanding clinical environments, and high-stakes evaluations [3]. This situation underscores the need to identify variables that can act as protective or aggravating factors for mental health in this group.

In contrast to the traditional deficit-focused approach—such as body dissatisfaction—positive psychology has introduced the construct of body appreciation, defined as the acceptance, respect, and positive valuation of one's own body. This paradigm shift is fundamental, as it transcends mere appearance to emphasize accepting the body as a functional and worthy tool of care. Unlike body dissatisfaction, international evidence indicates that body appreciation is associated with less depressive symptomatology, better self-esteem, and greater quality of life [4].

However, current evidence presents a certain paradox: while predominant aesthetic pressures in Western contexts suggest a deterioration in young people's self-image, some preliminary studies in medical schools propose that a deep knowledge of anatomy and physiology could foster a more objective and compassionate view of the human body. Nevertheless, this possible modulating effect of medical education has not been sufficiently contrasted in non-commercialized contexts. While some research reports greater body dissatisfaction among health students compared to other university groups, others suggest that professional training could promote a healthier relationship with the body [4,5].

Internationally, consistent gender differences in body appreciation have been documented, with women systematically reporting lower levels than men [6]. However, evidence on whether this pattern persists in specific populations of health science students remains limited.

MedEst. 2026| Vol. 6: e469
ISSN: 2789-7567 | RNPS: 2524

The assessment of body appreciation using brief and robust instruments facilitates its inclusion in large-scale mental health evaluations. The Body Appreciation Scale-2 (BAS-2) [7], in particular, has demonstrated adequate psychometric properties in diverse populations and cultural contexts, allowing for cross-cultural comparisons and institutional monitoring. Its simultaneous use with established mental health measures, such as the Generalized Anxiety Disorder-7 (GAD-7) [8] and the Patient Health Questionnaire-9 (PHQ-9) [9], is methodologically advisable for exploring the interrelationships between these constructs.

The Cuban medical education system presents distinctive particularities compared to models predominantly reported in the literature: free education, early community linkage, and a curriculum based on the biopsychosocial paradigm [10]. This context offers a unique setting for studying body image. However, the absence of national research integrating positive psychology perspectives with clinical mental health indicators prevents determining whether these particularities of the Cuban educational model effectively act as resilience factors against academic pressure and global aesthetic standards.

Scientific Problem: It is unknown whether body appreciation acts as a protective factor for mental health in Cuban medical science students, and whether the Cuban training model—with its community-oriented and biopsychosocial focus—modulates this relationship, attenuating the gender gaps typically reported in other contexts.

Therefore, this research aims to evaluate the relationship between body appreciation, mental health, and academic stress in Cuban medical science students, with the purpose of contributing to the design of psychological asset-based interventions for promoting well-being in this population.

METHODS

An observational, analytical, and cross-sectional study was conducted to assess body perception and mental health in Cuban medical science students. Data collection took place during the first fortnight of September 2025, encompassing a multicenter sample from 15 Cuban Universities of Medical Sciences.

Population and Sample

The reference population consisted of undergraduate and postgraduate (resident) health sciences students in Cuba. The final sample included 250 participants, selected through **non-probability convenience**

MedEst. 2026| Vol. 6: e469
ISSN: 2789-7567 | RNPS: 2524

and chain (snowball) sampling. Dissemination was conducted through student scientific societies and digital platforms, with the purpose of achieving heterogeneity regarding years of training and geographic origin within the national territory.

Inclusion criteria: being over 18 years old, being actively enrolled in a health degree program or residency in Cuba, and providing electronic informed consent.

Exclusion criteria: incomplete questionnaires (>10% of items unanswered) or inconsistent response patterns (e.g., zero variance on Likert scales).

Variables

Independent variables: Gender (male / female). Year of study (categorized into: 1st-2nd, 3rd-4th, 5th and beyond). Age (years completed). Body Mass Index (BMI, kg/m²). University of origin (15 Universities of Medical Sciences in Cuba)

Dependent variables: Level of body appreciation, measured using the Body Appreciation Scale-2 (BAS-2)(7). Level of anxiety, measured using the Generalized Anxiety Disorder-7 (GAD-7). Level of depression, measured using the Patient Health Questionnaire-9 (PHQ-9). Level of perceived academic stress

Methodological control variables: internal consistency of the instruments (Cronbach's α), normality of distribution (Shapiro-Wilk test), and homogeneity of variances (Levene's test).

Measurement Instruments

1. Sociodemographic and Academic Questionnaire: An ad-hoc instrument that collected self-reported age, gender, year of study, university, height, and weight (for BMI calculation).

2. Body Appreciation: An adapted 5-item version of the Body Appreciation Scale-2 (BAS-2) was used. This version was constructed by integrating items from the ultra-brief forms (of 2 and 3 items), which have demonstrated high convergent validity and reliability. The choice of this version responded to the need to optimize response time in the digital environment without compromising construct validity. The total score ranges from 5 to 25, where higher values indicate greater body appreciation. In this study, it showed excellent reliability (α = 0.865).

MedEst. 2026| Vol. 6: e469
ISSN: 2789-7567 | RNPS: 2524

3. Anxiety: The Generalized Anxiety Disorder-7 (GAD-7) scale was used, a 7-item instrument that assesses the frequency of anxiety symptoms over the past two weeks on a 4-point Likert-type scale (0 = "Not at all" to 3 = "Nearly every day"). The total score ranges from 0 to 21, with a score ≥10 considered indicative of clinically significant anxiety. Internal consistency in this sample was good (α = 0.836).

4. Depression: The Patient Health Questionnaire-9 (PHQ-9) was administered, a 9-item questionnaire measuring depressive symptoms over the past two weeks with the same response scale as the GAD-7. The total range is 0 to 27, with a cutoff point ≥10 for clinically relevant depression. It showed good reliability in this study (α = 0.846).

5. Perceived Academic Stress: This was measured using a single-item Visual Analogue Scale (VAS), ranging from 1 ("Not stressed at all") to 10 ("Extremely stressed"). This method, validated in cross-sectional epidemiological studies for its low cognitive load, assesses the overall level of stress attributed to academic demands.

Procedure

An electronic form was designed using *Google Forms*, which included the participant information sheet, informed consent, and the described instruments. The link was distributed through institutional and student contact networks. Participation was anonymous and voluntary, with an estimated completion time of 15-20 minutes. The data collection period spanned from September 1 to 15, 2025. Quality controls were implemented to identify and exclude duplicate responses (via IP address and timestamp) and invalid response patterns (e.g., straightlining).

Statistical Analysis

The analyses were performed using the Jamovi software (version 2.7). Initially, descriptive statistics (mean, standard deviation, frequencies) were calculated for all variables. Given that all main variables showed significant deviations from normality (Shapiro-Wilk test, $p < 0.001$), non-parametric methods were chosen. Comparisons by gender were performed using the Mann-Whitney U test, and by year of study using the Kruskal-Wallis test. Associations between continuous variables were assessed using Spearman's rank correlation coefficient (ρ). A significance level of $p < 0.05$ was adopted for all analyses. Effect size was reported using Rank-Biserial correlation (r) for comparisons (0.1=small; 0.3=medium; 0.5=large) and Spearman's ρ for correlations, using the same interpretation criteria.

Ethical Considerations

MedEst. 2026| Vol. 6: e469
ISSN: 2789-7567 | RNPS: 2524

The study protocol was approved by the Research Ethics Committee of the University of Medical Sciences of Camagüey. The research was conducted in accordance with the principles of the Declaration of Helsinki [11] and current Cuban bioethical regulations. Anonymity, data confidentiality, and voluntary participation were guaranteed. The database was stored on a secure server with restricted access to the principal investigators.

RESULTS

The study included 250 health sciences students from 15 Cuban Universities of Medical Sciences. The average age was 21.4 years (SD = 2.5; range: 18-35). Gender distribution showed a predominance of females (67.2 %; n=168) over males (32.8 %; n=82). The sample presented a balanced distribution by year of study, ranging from the basic cycle to postgraduate studies: 26.8 % (n=67) in initial years (1st-2nd), 35.2 % (n=88) in intermediate years (3rd-4th), and 38.0 % (n=95) in advanced years and residents (5th and beyond). The average Body Mass Index (BMI) was 22.3 kg/m² (SD = 4.6), within the range considered normal (Table 1).

Participants reported high levels of body appreciation, with a mean score of 21.5 (SD = 3.7) on the 5-item version of the BAS-2 (possible range: 5-25). Regarding mental health, global mean scores were in the subclinical range for anxiety (GAD-7: 6.9 ± 4.6) and depression (PHQ-9: 6.4 ± 5.3). However, upon analyzing clinical cut-off points, it was identified that 22.8 % (n=57) of the students presented clinically significant anxiety symptoms (GAD-7 ≥10), and 18.4 % (n=46) reached clinical levels of depression (PHQ-9 ≥10). Only 8.4 % (n=21) simultaneously exceeded both thresholds. The mean perceived academic stress score was 6.1 out of 10 (SD = 2.4), indicating a moderate to high presence of this factor (Table 1).

Table 1. Sociodemographic and Clinical Characteristics of the Sample (n=250)

Variable	n (%) / Mean ± SD	Median [IQR]	Range	p (Shapiro-Wilk)
Age (years)	21,4 ± 2,5	21,0 [2,75]	18-35	<0,001
Gender				

MedEst. 2026| Vol. 6: e469
ISSN: 2789-7567 | RNPS: 2524

Variable	n (%) / Mean ± SD	Median [IQR]	Range	p (Shapiro-Wilk)
Female	168 (67,2 %)	-	-	-
Male	82 (32,8 %)	-	-	-
Year of study				
1st-2nd	67 (26,8 %)	-	-	-
3rd-4th	88 (35,2 %)	-	-	-
5th+	95 (38,0 %)	-	-	-
IMC (kg/m²)	22,3 ± 4,6	22,0 [4,00]	14-59	<0,001
BAS-2 (5-25)	21,5 ± 3,7	22,0 [6,00]	5-25	<0,001
GAD-7 (0-21)	6,9 ± 4,6	6,0 [7,00]	0-21	<0,001
PHQ-9 (0-27)	6,4 ± 5,3	5,0 [7,00]	0-26	<0,001
Academic stress (1-10)	6,1 ± 2,4	6,0 [4,00]	1-10	<0,001

Source: Electronic form database.

***Note:** SD = Standard Deviation; IQR = Interquartile Range; BAS-2 = Body Appreciation Scale-2; GAD-7 = Generalized Anxiety Disorder-7; PHQ-9 = Patient Health Questionnaire-9.*

Normality tests (Shapiro-Wilk) indicated significant deviations from a normal distribution for all variables ($p < 0.001$), justifying the use of nonparametric statistics. Analysis using the Mann-Whitney U test revealed no statistically significant differences between men and women in body image ($U=6480$; $p=0.439$; $r=-0.06$), anxiety ($U=6058$; $p=0.121$; $r=0.12$), depression ($U=6327$; $p=0.295$; $r=0.08$), or academic stress ($U=6499$; $p=0.466$; $r=0.06$), with small effect sizes ($r \leq 0.12$) (Table 2).

MedEst. 2026| Vol. 6: e469
ISSN: 2789-7567 | RNPS: 2524

Similarly, the Kruskal-Wallis test showed no significant differences according to year of study in body image (H=3.50; p=0.835; ε^2=0.014), anxiety (H=7.64; p=0.365; ε^2=0.031), depression (H=11.75; p=0.109; ε^2=0.047), or academic stress (H=10.55; p=0.159; ε^2=0.042). Effect sizes were small in all cases ($\varepsilon^2 \leq 0.047$), indicating that academic advancement was not associated with a decline in these indicators in the studied sample.

Table 2. Comparisons by gender using the Mann-Whitney U test

Variable	Middle-aged Women [RIC]	Men Middle [RIC]	U	p	r (effect size)
BAS-2	22 [6,00]	23 [6,00]	6480	0,439	-0,06
GAD-7	7 [6,00]	6 [5,75]	6058	0,121	0,12
PHQ-9	4 [6,00]	5,5 [7,00]	6327	0,295	0,08
Academic stress	6 [3,00]	6 [4,00]	6499	0,466	0,06

*** Note:** U = Mann-Whitney U statistic; r = effect size

The Spearman correlation matrix (Table 3) revealed that body image showed statistically significant inverse correlations with anxiety (ρ = -0.273; $p < 0.001$), depression (ρ = -0.334; $p < 0.001$), and academic stress (ρ = -0.229; $p < 0.001$). These associations, although weak to moderate, indicate that higher body image is associated with lower reported levels of anxiety, depression, and academic stress. No significant association was found between body image and BMI (ρ = -0.007; p = 0.913).

On the other hand, a strong positive correlation was observed between anxiety and depression (ρ = 0.744; $p < 0.001$). Academic stress was moderately correlated with anxiety (ρ = 0.490; $p < 0.001$) and depression (ρ = 0.411; $p < 0.001$). BMI showed weak, though significant, positive associations with depression (ρ = 0.168; p = 0.008) and academic stress (ρ = 0.178; p = 0.005).

Table 3. Spearman correlation matrix between study variables

	BAS-2	GAD-7	PHQ-9	Academic stress	IMC
BAS-2	1	-0,273***	-0,334***	-0,229***	-0,007
GAD-7	-	1	0,744***	0,490***	0,106
PHQ-9	-	-	1	0,411***	0,168**
Academic stress	-	-	-	1	0,178**
IMC	-	-	-	-	1

***Note:** ** p < 0,01; *** p < 0,001.*

DISCUSSION

The results of this investigation reveal a distinctive psychodynamic profile among Cuban health science students. The main finding confirms the presence of high levels of body appreciation, which maintain an inverse and significant relationship with symptoms of anxiety, depression, and academic stress. This association positions positive body image not only as an indicator of well-being but also as a resilient psychological resource in a context of high educational demands.

The mean body appreciation score (21.5 ± 3.7) is notably higher than that reported in previous studies with university populations in the region, where reports of body dissatisfaction predominate, especially in health careers [12,13]. The authors consider that a plausible explanation lies in the particularities of the Cuban training model. Unlike contexts where body image is mediated by commercialized aesthetic standards, early linkage to clinical practice and the biopsychosocial approach seem to foster a view of the body based on its functionality and integral health, rather than its appearance. This interpretation is reinforced by the absence of correlation between BMI and body appreciation, suggesting that students value their bodies independently of conventional morphometric parameters.

Contrary to international literature, which systematically documents lower body appreciation in women due to sociocultural pressure [6,13], this study found no significant differences by gender. In general populations, women tend to internalize dominant aesthetic ideals more intensely, increasing their vulnerability to body image disorders

[14]. The authors opine that this finding suggests a possible equalizing effect of Cuban medical education. By internalizing a scientific and professional perspective of the human body, both men and women could develop a certain cognitive immunity to hegemonic beauty ideals, which disproportionately affect women in other environments.

The stability of body appreciation throughout the years of study indicates that this construct consolidates in the early stages of the career and is maintained despite the progressive increase in academic demands. This pattern contrasts with that observed in international longitudinal studies, where a deterioration in mental health indicators is frequently documented as medical training progresses [15]. The authors suggest that the resilience of body appreciation in the face of growing academic demands reinforces its potential role as a protective factor for mental health in this population.

It is important to highlight that, despite the high levels of body appreciation, 22.8 % and 18.4 % of the students presented clinical symptoms of anxiety and depression, respectively. This underscores the intrinsic vulnerability of this population. Nevertheless, the negative correlation between these variables suggests that body appreciation could act as a psychological buffer. The authors consider that, in the absence of this body acceptance, the prevalence of psychopathology given the reported levels of academic stress (mean of 6.1/10) could be considerably higher. Thus, body appreciation does not eliminate stress, but seems to modulate its impact, improving coping capacity. This finding is in line with international evidence supporting the protective role of a positive body image [16].

The meta-analysis conducted by Linardon et al. [17] consolidates the evidence that body appreciation is consistently associated with greater psychological well-being, less depressive symptomatology, and better quality of life. In the specific context of medical training, the authors opine that this construct acquires particular relevance, given its potential to mitigate the effects of the chronic academic stress characteristic of these studies.

The lack of association between BMI and body appreciation (ρ = -0.007; p = 0.913) reinforces the notion that body valuation in this population is detached from objective measures of body composition. This result contrasts with findings in general populations, where BMI usually correlates negatively with body satisfaction [6]. The authors suggest that this dissociation could reflect a more comprehensive and less stigmatizing understanding of health, cultivated during health sciences training.

The cross-sectional design of the study prevents establishing causal relationships between the variables. Although significant associations were identified, their directionality requires confirmation through longitudinal studies. Furthermore, the use of non-probability sampling may limit the generalization of the results. The authors acknowledge that, while the participation of 15 universities and the balanced distribution by year of study improve representativeness, the findings must be interpreted considering this methodological restriction.

Among the most robust methodological aspects are the use of internationally validated instruments, which demonstrated excellent psychometric properties in the sample (BAS-2: α = 0.865; GAD-7: α = 0.836; PHQ-9: α = 0.846). The sample size was adequate for the analyses performed, and statistical controls for multiple comparisons were implemented. Likewise, the anonymous and voluntary assessment minimized potential social desirability biases, particularly relevant when evaluating sensitive constructs such as body image.

CONCLUSIONS

Cuban medical students exhibit high levels of body image, which remain stable throughout their training and act as a protective factor against anxiety, depression, and academic stress. The absence of gender differences suggests that the Cuban educational model may mitigate the gaps commonly reported in body dissatisfaction. These findings support the integration of strategies to promote a positive body image into student wellness programs as an accessible and resilient resource for preserving mental health in demanding academic environments.

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AUTHORSHIP CONTRIBUTION

CJAP: Conceptualization, research, methodology, data collection, formal analysis (quantitative and qualitative), drafting, revision, and editing.

YPV: Conceptualization, research, original drafting, revision, and editing.

CPR: Research, data collection, formal analysis, revision, and editing.

AMAC: Research, methodology, data collection, revision, and editing.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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