The Predictive Role of BMI, Age, Economic Income, Mental Health, Personality and Internalization of Appearance Patterns on Body Dissatisfaction in Adults, Men and Women

El papel predictivo del IMC, la edad, los ingresos económicos, la salud mental, la personalidad y la internalización de patrones de apariencia sobre la insatisfacción corporal en adultos hombres y mujeres

O papel preditivo do IMC, idade, renda, saúde mental, personalidade e internalização de padrões de beleza na insatisfação corporal em homens e mulheres adultos

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Abstract

This article presents the results of an investigation of the predictive role of Body Mass Index (BMI), age, internalization of the socially established patterns of appearance, personality traits, mental health, and economic income on adults' body dissatisfaction. In this study, 156 men (28.5%) and 391 (71.5%) women participated (*M* age = 28.9). All participants responded to a sociodemographic questionnaire, the Mental Health Inventory (MHI5), the Reduced Personality Markers, the Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ-3, for its initials in Portuguese), and the Situational Body Satisfaction Scale (ESSC, for its initials in Portuguese). Multiple linear regression analyses were performed. For women, significant predictors of the variable dissatisfaction and fat were BMI (β = 0.52), internalization (β = 0.45), neuroticism (β = 0.12), and mental health (β = - 0.13), whereas among men, these were BMI (β = 0.59) and internalization (β = 0.38). Among women, significant predictors of satisfaction and external parts were age (β = -0.09), internalization (β = -0.15), neuroticism (β = -0.3), extroversion (β = 0.14), and mental health (β = 0.14), whereas among men, these were income (β = 0.18), internalization (β = -0.25) and extroversion (β = -0.21). The significant predictors of satisfaction and musculature for women were BMI (β = - 0.51), internalization (β = - 0.35), mental health (β = 0.19), and neuroticism (β = -0.13). Among men, these were BMI (β = -0.36), internalization (β = -0.27), conscientiousness (β = -0.22) and extroversion (β = 0.15). Finally, the

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significant preditors of satisfaction and lower parts in women were BMI (β = -0.45), internalization (β = -0.35) and neuroticism (β = -0.23), whereas among men, these were BMI (β = -0.45) and internalization (β = -0.17). Results identify differences between men and women and multiple variables that influence body dissatisfaction.
Keywords: Body image; body dissatisfaction; mental health.

Resumen

Este artículo presenta los resultados de la investigación del papel predictivo del índice de masa corporal (IMC), la edad, la internalización de los patrones de apariencia, los rasgos de personalidad, la salud mental y los ingresos económicos en la insatisfacción corporal en adultos. En el estudio participaron 156 (28.5%) hombres y 391 (71.5%) mujeres (*M* edad = 28.9). Todos respondieron un cuestionario sociodemográfico, el Inventario de Salud Mental (MHI5), los Marcadores Reducidos de Personalidad, el Cuestionario de Actitudes Socioculturales con Respecto a la Apariencia (SATAQ-3) y la Escala Situacional de Satisfacción Corporal (ESSC). Se realizaron análisis de regresión lineal múltiple. Para insatisfacción y gordura, los predictores significativos para las mujeres fueron el IMC (β = 0.52), la internalización (β = 0.45), el neuroticismo (β = 0.12) y la salud mental (β = - 0.13), mientras que para los hombres fueron el IMC (β = 0.59) y la internalización (β = 0.38). Para satisfacción y partes externas, entre las mujeres los predictores fueron la edad (β = -0.09), la interiorización (β = -0.15), el neuroticismo (β = -0.3), la extroversión (β = 0.14) y la salud mental (β = 0.14), mientras que entre los hombres fueron los ingreso (β = 0.18), la internalización (β = -0.25) y la extroversión (β = -0.21). Para satisfacción y músculo, los predictores para las mujeres fueron el IMC (β = -0.51), la internalización (β = -0.35), la salud mental (β = 0.19) y el neuroticismo (β = -0.13), y para los hombres estos fueron el IMC (β = -0.36), la internalización (β = -0.27), la escrupulosidad (β = -0.22) y la extroversión (β = 0.15). Para satisfacción y partes bajas, los predictores para las mujeres fueron el IMC (β = -0.45), la internalización (β = -0.35) y el neuroticismo (β = -0.23); para los hombres fueron el IMC (β = -0.45) y la internalización (β = -0.17). Los resultados identifican diferencias entre hombres y mujeres, y múltiples variables que influyen en la insatisfacción corporal.
Palabras clave: imagen corporal; insatisfacción corporal; salud mental.

Resumo

O objetivo do estudo é investigar o papel preditivo do Índice de Massa Corporal (IMC), idade, padrões de beleza internalizados, traços de personalidade, saúde mental e renda na insatisfação corporal em adultos. Um total de 156 (28.5%) homens e 391 (71.5%) mulheres (idade *M* = 28.9) participaram do estudo. Todos responderam a um questionário sociodemográfico, Inventário de Saúde Mental (MHI5), Marcadores Reduzidos de Personalidade, Questionário de Atitudes Socioculturais em Relação à Aparência (SATAQ-3) e Escala de Satisfação Corporal Situacional (ESSC). Análises de regressão linear múltipla foram realizadas. Para insatisfação e gordura, para as mulheres, o IMC (*β* = 0.52), internalização (*β* = 0.45), neuroticismo (*β* = 0.12) e saúde mental (*β* = -0.13) foram preditores significativos. Entre os homens, apenas o IMC (*β* = 0.59) e internalização (*β* = 0.38). Para satisfação e partes externas, entre as mulheres, idade (*β* = -0.09), internalização (*β* = -0.15), neuroticismo (*β* = -0.3), extroversão (*β* = 0.14) e saúde mental (*β* = 0.14) foram preditores. Já entre os homens, foram renda (*β* = 0.18), internalização (*β* = -0.25) e extroversão (*β* = -0.21). Para satisfação e músculo, para as mulheres, o IMC (*β* = -0.51), internalização (*β* = -0.35), saúde mental (*β* = 0.19) e neuroticismo (*β* = -0.13) foram preditores. Entre os homens, o IMC (*β* = -0.36), internalização (*β* = -0.27), consciência (*β* = -0.22) e extroversão (*β* = 0.15). Para as partes inferiores, para as mulheres, o IMC (*β* = -0.45), internalização (*β* = -0.35) e neuroticismo (*β* = -0.23) foram preditores e entre os homens, o IMC (*β* = -0.45) e internalização (*β* = -0.17). Os resultados identificam diferenças entre homens e mulheres e múltiplas variáveis que influenciam a insatisfação corporal.
Palavras-chave: imagem corporal; insatisfação corporal; saúde mental.

Body image involves perceptual components, such as the mental representation of size, shape, weight, and facial features, as well as attitudinal components, such as the cognitive, behavioral, and emotional investment attributed to the body and bodily evaluation. This evaluation is in terms of body satisfaction and dissatisfaction (Cash, 2011; Menzel et al., 2011). Body satisfaction refers to the degree of appreciation for one's physical appearance, especially regarding body weight and shape and specific body parts. Body dissatisfaction, in contrast, refers to discontentment with the body and its negative or unfavorable evaluations (Menzel et al., 2011). Body dissatisfaction is predicted by biological, psychological, and social variables (Allen & Robson, 2020; Paterna et al., 2021; Pawijit et al., 2017). Among the main predictive body dissatisfaction identified in the literature, there are sociocultural factors, such as the internalization of cultural patterns associated with the body and appearance and comparing to them (Paterna et al., 2021; Scully et al., 2020), biological factors, such as the body mass index (BMI) (Dion et al., 2016), personality traits (Allen & Robson, 2020), and mental health indicators, such as depression (Paans et al., 2018).

The valorization or devaluation of aesthetic attributes produces social ideals of beauty within a specific culture (Swami, 2015). These ideals are transmitted by sociocultural channels (e. g., media, peers, and family). Body dissatisfaction reflects the extent to which individuals comply or do not with this social ideal (Swami, 2015; Tiggemann, 2011). There is a core process that mediates this processes: internalization (Paterna et al., 2021; Scully et al., 2020), understood as the learning, imitation, and adoption of common rules and patterns about the body as something belonging to the self or as something with which the individual identifies (Morris et al., 2015). Meta-analytical studies have consolidated the evidence concerning the relation between body image ideals internalization and body dissatisfaction in female populations (Cafri et al., 2005; Paterna et al., 2021).

According to Paterna et al. (2021) and Karazsia (2017), an essential progression in body image internalization and body dissatisfaction studies is the conceptualization of socially prescribed ideals according to the predominant characteristics of thinness / low body fat and muscular tone and development. This progression relates to an increase of measurements and studies focused on the evaluation of specific body characteristics ideals, for instance. Another one is overcoming the notion that body image disturbances are gendered experienced (Grogan, 2016; Paterna et al., 2021). Whereas women are prone to internalize the thin ideal, men are to internalize the muscular one (Karazsia et al., 2017; Paterna et al., 2021).

The principal biological variable in the literature as a predictor of body dissatisfaction is BMI, which derives from the individual's weight and height (Rodgers et al., 2014). The accumulation of body fat and weight gain are phenomena stigmatized in society, distancing the body evaluated by the individual from the body internalized as the ideal (Stevens et al., 2017). Overweight and obese individuals have significantly higher levels of body dissatisfaction than normal weight individuals (Weinberger et al., 2016).

Another predictive variable of body dissatisfaction is personality. The higher the levels of "Neuroticism," the more hostile assessment of the body image in men and women due to the emotional instability disposition and the greater importance attributed to physical appearance (Allen & Robson, 2020; Allen & Walter, 2016). On the other hand, people with higher levels of "Extroversion" are less susceptible to body dissatisfaction (Allen & Walter, 2016), possibly because they experience more positive emotions and are more communicative, which makes them less vulnerable to sociocultural factors that contribute to dissatisfaction (Allen & Walter, 2016; Steel et al., 2008). Some characteristics of "Conscientiousness", such as the tendency to endorse social patterns, may contribute to greater body dissatisfaction. However,

the tendency toward greater organization characteristic of this personality factor can also lead to a healthier lifestyle, which contributes to greater satisfaction (Allen & Walter, 2016; Sutin & Terracciano, 2016).

In addition, studies indicate significant associations between the severity of depressive symptoms and body dissatisfaction (Goldschmidt et al., 2016; Paans et al., 2018). Paans et al. (2018) postulated that body image distortion is a cognitive symptom of depression. Studies have also highlighted associations between body dissatisfaction and higher levels of anxiety (Pawijit et al., 2017; Regis et al., 2018). Wichstrøm and Von Soest (2016) also identified that assessing appearance strongly correlates with overall self-esteem.

Several mental health indicators also act as predictors of body dissatisfaction. Studies indicate significant associations between the severity of depressive symptoms and higher levels of body dissatisfaction (Goldschmidt et al., 2016; Paans et al., 2018). Paans et al. (2018) postulated that body image distortion is a cognitive symptom of depression. Studies have also highlighted associations between body dissatisfaction and higher levels of anxiety (Pawijit et al., 2017; Regis et al., 2018). Excessive levels of body dissatisfaction are a pivotal symptom of Body Dysmorphic Disorder, characterized by a distorted perception of the body image, which impairs the individual's biopsychosocial functioning (American Psychiatric Association, 2013). Finally, overestimation of the weight and shape and a self-assessment focused solely on body image are determinant symptoms in terms of prediction and maintenance of eating disorders. These disorders are characterized by severe gastrointestinal, metabolic, immunological, systemic, and psychosocial complications (Forbush et al., 2016).

Regarding, a study carried out with 5868 women between 25 and 89 years of age observed that there is a significant prevalence of body dissatisfaction in women of all age groups and that there is no linear relationship between aging and reduced body dissatisfaction (Runfola et al., 2013). In contrast, there are studies focused on other facets of body image, such as the relationship between body appreciation, a positive aspect of body image, and aging. These studies point to a positive correlation between age and body positivity (Swami et al., 2008; Tiggemann & McCourt, 2013). According to Tiggemann and McCourt (2013), the coexistence in women of body dissatisfaction and an appreciation and respect for the body for other bodily characteristics and functionalities is possible. Men are more satisfied with their body image than women in different age groups (Karazsia et al., 2017).

A better comprehension of the etiology and maintenance of body dissatisfaction thanks to the proven value of biopsychosocial approaches (Rodgers et al., 2014). However, few empirical studies have attempted to construct a predictive model of body dissatisfaction integrating diverse variables (Andrew et al., 2016; Rodgers et al., 2018). In the Brazilian context, a systematic review identified a lack of studies that include men and women in the sample that uses measurements developed or validated for both sexes (Laus et al., 2014).

Thus, this study aimed to identify biopsychosocial variables that predict body dissatisfaction among adult men and women in Brazil. To assess multiple attributes of body dissatisfaction, different parts of the body evaluation were investigated through a psychometric instrument developed and validated for men and women. The Situational Body Satisfaction Scale —ESSC, for its initials in Portuguese— (Hirata & Pilati, 2010*)* measures dissatisfaction with body fat and satisfaction with external parts (e. g., face, hair, skin), body musculature (e. g., muscle definition), and lower parts (e. g., flaccidity, cellulite, glutes). This evaluation contributes to overcoming overcomethe bias of a field historically characterized by using measurements focused on global appearance or single body image features (e. g., thinness or muscularity). It also allowed a broader comprehension

of body dissatisfaction between men and women (Paterna et al., 2021).

Based on the literature, one of our hypotheses was that higher levels of BMI (Dion et al., 2016), general internalization of the socially established patterns of appearance (Paterna et al., 2021), and Neuroticism and lower levels of Extroversion (Allen & Robson, 2020) and mental health (Paans et al., 2018; Regis et al., 2018) would be predictors of greater body dissatisfaction in men and women. Another hypothesis was that higher income levels would predict greater dissatisfaction with body fat and the lower parts (Czyz et al., 2016; Swami et al., 2010). Lastly, we hypothesized age would not be a significant predictor of body dissatisfaction (Runfola et al., 2013). We did not formulate a hypothesis for Conscientiousness, as some characteristics of this trait can be favorable to body dissatisfaction while others are unfavorable (Allen & Robson, 2020).

Method

Participants

A total of 547 subjects participated in the study, 28.5 % (n = 156) males and 71.5 % (n = 391) females. The criterion for inclusion was to be Brazilian and over 18 years of age. The mean age of the participants was 28.9 years (SD = 9.79, range 18-65). Regarding the ethnic-racial characteristics, according to the IBGE classification, the majority declared themselves to be of white color or race (70.6 %, n = 386), followed by brown (22.1 %, n = 121), black (6.4 %, n = 35), and yellow/Asian (0.7 %, n = 4), with only one-person reporting being indigenous (0.2 %).

Concerning the region of the country, most of them reported residing in the south and southeast regions, with 55.4 % (n = 303) from Rio de Janeiro, 17.6 % (n = 96) São Paulo, 6.9 % (n = 38) Rio Grande do Sul, 4.2 % (n = 23) Minas Gerais, and 2 % (n = 11) from Paraná. Brazilians who did not live in Brazil (3.1 %; n = 17) also participated. Regarding the monthly income of the participant or the family, 32.9 % (n = 180) reported receiving more than eight minimum wages, 25.6 % (n = 140) from one to three, 18.3 % from five to eight (n = 100), 17.4 % (n = 95) from three to five, and 5.9 % (n = 32) reported receiving up to one minimum wage. In relation to schooling, the most frequent level was Incomplete Higher Education (35.6 %, n = 195), followed by Complete Post Graduation (24.3 %; n = 133) and Complete Higher Education (22.3 %; n = 122). Participants were also asked whether they regularly engaged in physical activity. A total of 59.0 % (n = 92) of the men and 46.8 % (n = 183) of the women stated practicing physical exercise.

Instruments

Sociodemographic questionnaire: instrument developed for the study to collect relevant sociodemographic data for the description and general characterization of the sample and calculation of the BMI.

Situational Body Satisfaction Scale (Escala Situacional de Satisfação Corporal - ESSC): instrument developed and validated by Hirata and Pilati (2010). The instrument has 23 items, answered on a Likert-type scale, that evaluate men's and women's body satisfaction. The instrument has four factors: Dissatisfaction and Fat with items such as "I think I have too much fat on my body" and "I am discontent with my belly," External Parts with items such as "I am satisfied with my hair" and "I am satisfied with my face," Satisfaction and Muscle with items such as "In general, I am satisfied with my muscle definition" and "I like the width of my shoulders," and Lower Parts with items such as "I am satisfied with the size of my glutes" and "I am satisfied with the size of my hips". In this study, the scale presented the following properties: CFI = 0.91; TLI = 0.90; RMSEA = 0.10; WRMR = 1.88.

Mental Health Inventory (MHI-5): one of the eight subscales part of the SF-36 (Ware et al., 1993).

The instrument consists of 5 items, answered on a Likert-type scale, that assess symptoms of depression and anxiety; higher scores indicate better levels of mental health. The Brazilian version was validated by Damásio et al. (2014); it presented the following properties in the present study: CFI = 0.99; TLI = 0.97; RMSEA = 0.16; WRMR = 1.13.

Reduced Personality Markers: instrument constructed by Nelson Hauck Filho et al. (2012). It consists of 25 items related to the respondent's personality characteristics. It uses a Likert-type response scale, ranging from 1 (completely disagree) to 5 (completely agree). The factorial solution of the instrument presents 25 personality markers, 5 for each personality factor (Extroversion, Socialization, Conscientiousness, Neuroticism, and Openness). It presented the following properties in the present study: (CFI = 0.86; TLI = 0.84; RMSEA = 0.09; WRMR = 1.93).

Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ-3): instrument constructed by Thompson and collaborators (2004). It has 30 items, answered on a Likert-type scale, that evaluate four dimensions: (1) the general internalization of the socially established patterns related to appearance, (2) the pressure exerted by these patterns, (3) the media as a source of information about appearance, and (4) the internalization of the athletic body ideal. The Brazilian version was adapted by Amaral et al. (2013). In the present study, only the general internalization factor was considered and analyzed; it presents items such as "I compare my body to that of people in good shape" and "I compare my appearance to TV and cinema stars." It presented the following psychometric properties: (Kaiser-Meyer-Olkin [KMO] = 0.91; Bartlett's test of sphericity = 3618.5; p <.001; CFI = 0.98; TLI = 0.98; RMSEA = 0.21; WRMR = 2.25).

Ethical Procedures and Data Collection

The present study was approved by a certified research ethics committee (CAAE No. 3.339.673) and followed the guidelines of Resolution 466/2012 of Brazil's National Health Council. Data collection was performed virtually through the Survey Monkey Platform. Participants were recruited on social media. On the first page of the questionnaire, the participants had access to the consent form, where they were informed about the confidentiality of the information obtained, the requirements to participate in the study, the risks and benefits related to participating, and all necessary ethical clarifications. Only the participants that agreed and signed the consent form took part in the study.

Data Analysis Procedures

Initially, Students' t-tests were conducted to verify mean differences between men and women in relation to BMI, age, internalization, conscientiousness, neuroticism, extroversion, mental health indicators, and each factor of the *Situational Body Satisfaction Scale* —the dependent variables of the study (dissatisfaction and fat, muscle and satisfaction, lower parts, and external parts)— (Hirata & Pilati, 2010). Pearson correlation analyses were performed between the independent variables of the study and the dependent variables. A Spearman correlation analysis was performed between "income" and the other variables.

Multiple linear regression analyses were carried out using the forced entry method (insert or enter) to verify the power of the variables of interest (BMI, age, internalization, income, personality, conscientiousness, and mental health indicators) as predictors of body dissatisfaction measured through the ESSC scale (Hirata & Pilati, 2010). All analyses were performed in the SPSS 20 program (*Statistical Package for the Social Sciences*). The recommended requirements for linear regression analysis were analyzed (Field, 2013). In relation to the statistical significance, a level lower than or equal to 0.05 was adopted.

Results

Table 1 summarizes the mean scores and men's and women's differences for BMI, age, mental health indicators measured through the MHI-5 (Damásio et al., 2014; Ware et al., 1993), general internalization of the socially established patterns of appearance, measured through the SATAQ-3 (Amaral et al., 2013; Thompson et al., 2004), each personality factor, measured by the Reduced Personality Markers (Hauck Filho et al., 2012), and the different factors of the ESSC (Hirata & Pilati, 2010).

In relation to the mean scores for the ESSC (Hirata & Pilati, 2010), women presented significantly higher levels than men for the factor Dissatisfaction and fat $t(544)= 3.79$; $p <.001$, while men presented significantly higher levels than women in the factors associated with body satisfaction such as satisfaction with the external parts, which relates to satisfaction with hair, face, skin and bodily hair, satisfaction with the body musculature, which relates to satisfaction with muscle definition and muscle size, and satisfaction with the lower parts, which relates to satisfaction with glutes, cellulite, and flaccidness of the legs.

Correlation analyses between the independent variables of the study are described in Table 2. Table 3 describes the correlation analysis between the independent variables of the study and the dependent variables of the study measured through the ESSC (Hirata & Pilati, 2010).

Table 1
Mean scores, standard deviation, and mean differences between men and women

Independent Variable	*M* men	*M* women	T-test	Cohen's d
BMI	25.61, *SD* = 4.73	24.30, *SD* = 4.69	t(544) = -0.88, p = .38	.28
Age	29.50, *SD* = 10.31	28.69, *SD* = 9.58	t(544) = -0.88; p = 0.38	.08
Internalization	17.56, *SD* = 7.11	19.88, *SD* = 8.31	t(331.10) = 3.27, **p < .001**	.30
Neuroticism	14.79, *SD* = 4.26	16.71, *SD* = 4.09	t(544) = 4.89, **p < .001**	.46
Conscientiousness	19.33, *SD* = 3.26	19.62, *SD* = 3.07	t(544) = 0.95, p = .34	.09
Extroversion	14.79, *SD* = 4.26	15.34, *SD* = 4.63	t(325.15) = -0.36, p = .72	.03
MHI5	18.12, *SD* = 4.16	15.88, *SD* = 4.16	t(388.90) = -6.41, **p < .001**	.59
Dependent Variable				
Dissatisfaction and fat	20.66, *SD* = 6.38	23.10, *SD* = 6.5	t(544) = 3.79, **p<.001**	.37
External parts	14.24, *SD* = 3.00	13.13, *SD* = 3.54	t(333.75) = -3.72, **p<.001**	.34
Satisfaction and muscle	24.49, *SD* = 5.62	23.09, *SD* = 6.54	t(544) = -2.35, p = .02	.23
Lower parts	15.29, *SD* = 2.79	12.25, *SD* = 3.62	t(367.55) = -10.52, **p<.001**	.46

Note: Bold highlighted results are statistically significant mean score differences at the .05 level. The degrees of freedom for the t-tests are taken from the Levene test for equality of variances.

Table 2
Correlation between BMI, age, income, internalization, neuroticism, Conscientiousness, extroversion, MHI5 (Independent Variables)

IV*	1	2	3	4	5	6	7	8
1. BMI		.25 p < .001	-.01 p = .78	-.04 p = .49	- .05 p = .36	-.05 p = .33	.18 p < .001	.09 p = .07
2. Age	**.37** **p < .001**		.13 p = .01	-.17 p <.001	-.23 p < .001	-.03 p = .61	.23 p < .001	.13 p = .01
3. Income	**.23** **p < .001**	**.28** **p < .001**		.04 p = .47	-.16 p = .01	-.06 p = .23	.11 p = .03	.17 p < .001
4. Internalization	**-.18** **p = .02**	**-.28** **p <.001**	**-.04** **p = .60**		.38 p < .001	-.13 p - .01	-.22 p < .001	-.35 p < .001
5. Neuroticism	**-.03** **p = .68**	**-.16** **p = .04**	**-.24** **p < .001**	**.28** **p <.001**		-.19 p <.001	-.42 p < .001	-.73 p < .001
6. Conscientiousness	**-.07** **p = .36**	**.17** **p = .03**	**.14** **p = .07**	**.01** **p = .93**	**-.07** **p = .35**		.11 p = .02	.24 p < .001
7. Extroversion	**.11** **p = .16**	**.05** **p = .52**	**.04** **p = .60**	**-.10** **p = .21**	**-.36** **p < .001**	**.13** **p = .09**		.34 p < .001
8. MHI5	**.03** **p = .69**	**.11** **p = .16**	**.25** **p < .001**	**-.32** **p < .001**	**-.68** **p < .001**	**.02** **p = .78**	**.13** **p = .11**	

Note: IV* = Independent Variable; men in bold.

Table 3
Correlation between BMI, age, income, internalization, neuroticism, conscientiousness, extroversion, MHI5 (Independent Variables) and dissatisfaction and fat, satisfaction and external parts, satisfaction and muscle, and satisfaction and lower parts (Dependent Variables)

Predictor variables grouped by gender	Dissatisfaction and fat	Satisfaction and external parts	Satisfaction and muscle	Satisfaction and lower parts
Men				
BMI	**.42;** p < .001	.09; p = .27	-.11; p = .16	**-.30;** p < .001
Age	.15; p = .06	.08; p = .33	.09; p = .24	.08; p = .34
Income	**-.22;** p = .01	**-.28;** p < .001	**.32;** p < .001	**.33;** p < .001
Internalization	**.34;** p < .001	**-.32;** p < .001	**-.33;** p < .001	**-.25;** p < .001
Neuroticism	**.28;** p < .001	**-.35;** p < .001	**-.40;** p < .001	**-.33;** p < .001
Conscientious ness	.01; p = .88	.05; p = .55	-.07; p = .36	.03; p = .71
Extroversion	-.09; p = .25	**.29;** p < .001	**.23;** p < .001	**.16;** p < .04
MHI5	**-.21;** p = .01	**.33;** p < .001	**.32;** p < .001	**.30;** p < .001
Women				
BMI	**.47;** p < .001	.09; p = .08	**-.45;** p < .001	**-.30;** p < .001
Age	.04; p = .43	.08; p = .12	-.01; p = .85	-.05; p = .35
Income	-.03; p = .57	.08; p = .10	.05; p = .35	.03; p = .56

	Dissatisfaction and fat	Satisfaction and external parts	Satisfaction and muscle	Satisfaction and lower parts
Internalization	**.47;** p < .001	**-.31;** p < .001	**-.42;** p < .001	**-.42;** p < .001
Neuroticism	**.33;** p < .001	**-.49;** p < .001	**-.38;** p < .001	**-.38;** p < .001
Conscientiousness	-.1; p = .05	**.11;** p = .02	**.16;** p < .001	**.15;** p < .001
Extroversion	-.05; p = .33	**.34;** p < .001	**.13;** p = .01	**.15;** p < .001
MHI5	**-.29;** p < .001	**.45;** p < .001	**.35;** p < .001	**.29;** p < .001

Note: Bold highlighted results are statistically significant correlations at the .05 level.

Through multiple linear regression, the ability of the variables of interest to be predictors (independent variables of the regression model) of body dissatisfaction was tested for men and women for each of the four factors of the ESSC (Hirata & Pilati, 2010). Accordingly, four different models were tested for women and men. For men and women, all four models proposed fitted the data satisfactorily and adhered to the basic assumptions of regression analysis (Field, 2013).

For the women, in relation to the factor Dissatisfaction and Fat, the analysis resulted in a statistically significant model in which $F(8.381) = 61.73$; $p < .001$; $R^2 = 0.56$, for the External Parts Factor, $F(8.381) = 22.41$; $p < .001$; $R^2 = 0.31$. For the factor Satisfaction and Muscle the results were $F(8.381) = 52.80$; $p < .001$; $R^2 = 0.53$, finally, for the Lower Parts factor, $F(8.381) = 29.32$; $p < .001$; $R^2 = 0.37$. Regression analysis for women is summarized in Table 4.

Table 4
Regression analysis for women

	b	SE	β	t	p	95 % CI
Dissatisfaction and fat						
Constant	-6.46	3.47	-	-1.86	.06	[-13.28, 0.36]
BMI	0.77	0.05	0.52	14.45	<.001*	[0.67, 0.87]
Age	0.02	0.03	0.03	0.75	.45	[-0.03, 0.07]
Income	0.12	0.19	0.02	0.65	.52	[-0.25, 0.49]
Internalization	0.33	0.03	0.45	12.02	<.001*	[0.31, 0.44]
Neuroticism	0.21	0.09	0.12	2.35	.02*	[0.03, 0.39]
Conscientiousness	0.09	0.08	0.04	1.06	.29	[-0.07, 0.24]
Extroversion	0.04	0.06	0.03	0.71	.48	[-0.07, 0.15]
MHI-5	-0.22	0.09	-0.13	-2.55	.01*	[-0.38, -0.05]
Satisfaction and external parts						
Constant	14.93	2.21	-	6.77	<.001*	[10.59, 19.27]
BMI	0.06	0.03	0.08	1.74	.08	[-0.01, 0.13]
Age	-0.04	0.02	-0.09	-2.06	.04*	[-0.07, 0]
Income	-0.01	0.12	0	-0.06	.95	[-0.24, 0.23]
Internalization	-0.06	0.02	-0.15	-3.23	<.001*	[-0.10, -0.03]
Neuroticism	-0.27	0.06	-0.3	-4.66	<.001*	[-0.38, -0.15]
Conscientiousness	0	0.05	0	0.01	.99	[-0.10, 0.1]
Extroversion	0.11	0.04	0.14	2.86	<.001*	[0.03, 0.17]
MHI-5	0.12	0.05	0.14	2.25	.03*	[0.02, 0.23]

	b	SE	β	t	p	95 % CI
Satisfaction and muscle						
Constant	43.06	3.41	-	12.6	<.001*	[36.36, 49.76]
BMI	-0.71	0.05	-0.51	-13.55	<.001*	[-0.81, -0.61]
Age	0	0.03	-0.01	-0.12	.90	[-0.05, 0.05]
Income	-0.10	0.18	-0.02	-0.52	.60	[-0.46, 0.27]
Internalization	-0.28	0.03	-0.35	-8.98	<.001*	[-0.34, -0.22]
Neuroticism	-0.20	0.09	-0.13	-2.30	.02*	[-0.38, -0.03]
Conscientiousness	0.05	0.08	0.03	0.69	.49	[-0.10, 0.21]
Extroversion	0.06	0.06	0.04	1.04	.30	[-0.05, 0.17]
MHI-5	0.29	0.08	0.19	3.50	<.001*	[0.13, 0.45]
Satisfaction and lower parts						
Constant	24.10	2.16	-	11.16	<.001*	[19.86, 28.35]
BMI	-0.26	0.03	-0.34	-7.92	<.001*	[-0.33, -0.20]
Age	-0.03	0.02	-0.08	-1.89	.06	[-0.06, 0]
Income	-0.01	0.12	0	-0.06	.95	[-0.24, 0.22]
Internalization	-0.15	0.02	-0.35	-7.84	<.001*	[-0.19, -0.11]
Neuroticism	-0.21	0.06	-0.23	-3.66	<.001*	[-0.32, -0.10]
Conscientiousness	0.05	0.05	0.04	0.92	.36	[-0.05, 0.14]
Extroversion	0.04	0.04	0.05	1.01	.29	[-0.03, 0.11]
MHI-5	0.03	0.05	0.03	0.52	.60	[-0.08, 0.13]

Note: *statistically significant results at .05 level.

For the men, in relation to the factor Dissatisfaction and Fat, the analysis resulted in a statistically significant model in which $F(8.146) = 18.02$; $p < .001$; $R^2 = 0.47$, for the External Parts factor results were $F(8.146) = 5.64$; $p < .001$; $R^2 = 0.19$. The Satisfaction and Muscle factor was $F(8.146) = 9.23$; $p < .001$; $R^2 = 0.30$, finally, the Lower Parts factor's analysis again resulted in a significant model in which $F(8.146) = 7.98$, $p < .001$; $R^2 = 0.27$. Regression analyses for men are summarized in Table 5.

Table 5
Regression analyses for men

	b	SE	β	t	p	95 % CI
Dissatisfaction and fat						
Constant	-13.98	5.99	-	-2.33	.02*	[-25.82, -2.14]
BMI	0.79	0.09	0.59	9.03	<.001*	[0.62, 0.97]
Age	0.05	0.04	0.08	1.22	.22	[-0.03, 0.14]
Income	-0.24	0.29	-0.05	-0.83	.40	[-0.81, 0.33]
Internalization	0.34	0.06	0.38	5.77	<.001*	[0.22, 0.45]
Neuroticism	0.25	0.13	0.17	1.87	.06	[-0.02, 0.51]
Conscientiousness	1.08	0.60	0.11	1.80	.07	[-0.11, 2.27]
Extroversion	-0.07	0.10	-0.04	-0.66	.51	[-0.27, 0.13]
MHI-5	0.05	0.16	0.03	0.31	.75	[-0.26, 0.36]

	b	SE	β	t	p	95% CI
Satisfaction and external parts						
Constant	10.91	3.42	-	3.19	<.001*	[4.15, 17.68]
BMI	0.01	0.05	0.09	0.23	.82	[-0.09, 0.11]
Age	-0.03	0.02	-0.09	-1.09	.28	[-0.07, 0.02]
Income	0.39	0.18	0.18	2.36	.02*	[0.06, 0.71]
Internalization	-0.10	0.03	-0.25	-3.11	<.001*	[-0.17, -0.04]
Neuroticism	-0.04	0.08	-0.06	-0.56	.58	[-0.19, 0.11]
Conscientiousness	0.15	0.34	0.03	0.43	.67	[-0.53, 0.82]
Extroversion	0.15	0.06	-0.21	2.59	.01*	[0.04, 0.27]
MHI-5	0.11	0.09	0.13	1.27	.21	[-0.06, 0.29]
Satisfaction and muscle						
Constant	41.48	5.60	-	6.92	<.001*	[29.63, 53.34]
BMI	-0.42	0.09	-0.36	-4.73	<.001*	[-0.60, -0.24]
Age	0.06	0.04	0.11	1.38	.17	[-0.03, 0.14]
Income	0.39	0.29	0.10	1.37	.17	[-0.18, 0.96]
Internalization	-0.21	0.06	-0.27	-3.56	<.001*	[-0.32, -0.09]
Neuroticism	-0.24	0.13	-0.18	-1.79	.08	[-0.50, 0.03]
Conscientiousness	-1.86	0.60	-0.22	-3.12	<.001*	[-3.06, -0.69]
Extroversion	0.21	0.10	0.15	2.04	.04*	[0.01, 0.41]
MHI-5	0.10	0.16	0.06	0.64	.52	[-0.21, 0.41]
Satisfaction and lower parts						
Constant	21.54	3.06	-	7.03	<.001*	[15.49, 27.60]
BMI	-0.26	0.05	-0.45	-5.88	<.001*	[-0.35, -0.18]
Age	0.04	0.02	0.15	1.82	.07	[-0.003, -0.08]
Income	0.21	0.15	0.11	1.43	.16	[-0.08, 0.50]
Internalization	-0.07	0.03	-0.17	-2.27	.03*	[-0.13, -0.01]
Neuroticism	-0.08	0.07	-0.12	-1.15	.25	[-0.21, 0.06]
Conscientiousness	-0.49	0.31	-0.16	-1.58	.12	[-1.09, 0.12]
Extroversion	0.09	0.05	0.13	1.72	.09	[-0.01, 0.19]
MHI-5	0.08	0.08	0.10	1.02	.31	[-0.08, 0.24]

Note: *statistically significant results at .05 level.

Discussion

Among the results, it should be highlighted that women, when compared to the men, presented higher levels of body dissatisfaction, according to the Dissatisfaction and Fat factor, and lower levels of Satisfaction and External parts, Satisfaction and Muscle, and Satisfaction and Lower Parts, indicating, in general, greater body dissatisfaction than men. A cross-temporal meta-analysis study identified that women of different age groups are more dissatisfied than men when the parameter is dissatisfaction driven by the desire to be thinner; however, men are more dissatisfied when the parameter is muscular satisfaction (Karazsia et al., 2017). Therefore, one hypothesis of the present study was that men would have lower levels of satisfaction with body musculature. Nevertheless, in this study, men's Satisfaction and Muscle levels were significantly higher than women's. These findings may relate to the greater proportion of men who reported regularly engaging in physical activity. Among men, 59.0% (n = 92) practiced physical activity, the percentage among women is

46.8% (n = 183). The practice of physical exercise can contribute to a more positive body assessment regarding fat and musculature (Alleva et al., 2015). This finding may also be associated with other characteristics present in the female sample, such as higher levels of internalization (Paterna et al., 2021), Neuroticism (Allen & Robson, 2020), and lower levels of mental health (Paans et al., 2018; Pawijit et al., 2017).

Considering the general internalization of socially established patterns related to appearance, evaluated through the SATAQ-3 (Amaral et al., 2013; Thompson et al., 2004), it is important to highlight that it was a relevant predictor factor for men and women, as hypothesized, although the women's mean was higher. Their weight in the regression equation ranged from -0.15 to 0.45 for women and from -0.17 to 0.38 for men. Considering the content of the Internalization factor of the SATAQ-3 (Amaral et al., 2013; Thompson et al., 2004), which essentially refers to the desire to appear like the models represented in the media and the comparison with people considered to be in good shape, this finding reinforces the importance of the influence of the sociocultural context and the channels of transmission of cultural patterns associated with the body and of the body comparison in the configuration of body dissatisfaction (Paterna et al., 2021; Swami, 2015; Tiggemann, 2011).

The lower levels of mental health presented by the women in the sample compared to the men are a finding in line with the literature, which identifies women as having higher levels of anxiety and depression (Albert, 2015; Van Droogenbroeck et al., 2018; McLean et al., 2011). It is relevant to emphasize that, differing from our initial hypothesis, mental health levels were a significant predictor variable only for women; they were predictors of dissatisfaction with body fat (-0.13) and satisfaction with body musculature (0.19). Complementarily, it was also observed that higher levels of Neuroticism were a significant predictor only for women, predicting Dissatisfaction with Body Fat (0.12), Satisfaction and External Parts (-0.31), and Satisfaction and Lower Parts (-0.23). Women also presented significantly higher levels of Neuroticism than men, which is also in line with the literature (South et al., 2018). Neuroticism is related to a tendency to experience negative emotions, including dissatisfaction and low self-confidence, and predicts most psychopathology indicators (Jeronimus et al., 2014).

A study by Allen and Robson (2020) found that Neuroticism was a predictor of body dissatisfaction for men and women. However, this relationship may be stronger in women and, therefore, it is recommended to investigate gender as a moderating variable of this association. It may be inferred, for example, that women ruminate more than men, behavior typically related to Neuroticism, and, thus, suffer more from issues associated with the body (Barlow et al., 2014). This result highlights the vulnerability to body satisfaction associated with worse mental health indicators and strongly associated characteristics, such as Neuroticism (Allen & Robson, 2020; Jeronimus et al., 2014; Paans et al., 2018; Regis et al., 2018; Rodgers et al., 2014).

On the other hand, results showed women presented significantly higher levels of internalization of cultural patterns associated with the body than men. According to Thompson and Stice (2001), as body patterns are internalized, people may perceive discrepancies between themselves and the internalized patterns, triggering diminishing self-assessments. According to Cash (2011), there is an intimate relationship between cultural aspects, such as the internalization of normative body patterns, and proximal aspects, such as the activation of cognitive and behavioral schemas associated with body image, for example, arriving at conclusions from body comparisons. Day-to-day events, such as body exposure or checking the body in the mirror, activate these cognitive behavioral schemas. Therefore, it is possible to reflect on the association between the internalization of female

beauty patterns and other emotional, cognitive, and behavioral mechanisms, such as the mobilization of negative affects and their harmful effects on self-esteem, self-perception, and bodily self-assessment (John et al., 2008; Rodgers et al., 2014).

In addition, there is evidence in the literature that income is a predictor of body dissatisfaction, especially considering bodily fat (Czyz et al., 2016; Swami et al., 2010). Accordingly, our hypothesis was that it would be a significant predictor of factors associated with body fat (Dissatisfaction and Fat and Lower Parts). In the present study, however, income presented a significant correlation to the four factors of the ESSC (Hirata & Pilati, 2010) for the male sample. Moreover, it was only a predictor of male satisfaction with external parts. In the ESSC, the items that compose this factor refer to satisfaction with skin, hair, face, and bodily hair, for example (Hirata & Pilati, 2010). Therefore, it is possible to think that, for men, a higher income allows more investment in aesthetic attributes and greater satisfaction with the external parts.

The fact that income was not a predictor of body dissatisfaction for other factors for men and women may be associated with the poor heterogeneity of the sample in terms of socioeconomic status since 70.6% (n = 386) of the participants were white, more than half of the sample reported having an income of more than five minimum wages, most of them lived in the southeastern and southern regions, the richest areas of the country, and the participants presented high levels of education.

It is interesting to discuss that regarding Dissatisfaction and Fat, for women and men, higher levels of BMI and higher levels of internalization were the variables with greater predictive weight in the proposed model. This finding is in line with the literature, which identifies that body fat accumulation and weight gain distance the individual's self-assessed body from the culturally propagated and internalized optimal ideal (Stevens et al., 2017; Weinberger et al. 2016).

Furthermore, age appeared as a significant predictor factor only for women. Higher ages predicted lower levels of satisfaction with external parts (-0.09). The content of this factor is related to hair, body hair, and face. Facial changes related to the aging process, such as the appearance of wrinkles, for example, or the appearance of white hair, may increase vigilance regarding face and hair. According to Runfola et al. (2013), there is no linear relationship between aging and reduced body dissatisfaction in women. Nevertheless, most of the studies on body image focus on global appearance or single body image features (Paterna et al., 2021). In this sense, this result suggests the importance of analyzing satisfaction with different body parts.

For women, in relation to the Satisfaction and External Parts factor together with lower levels of internalization (-0.15) and Neuroticism (-0.31), and higher levels of Extroversion (0.14) were predictor variables. In the same factor, for men, higher levels of Extroversion (0.21) were also significant predictors, consistent with the literature (Allen & Robson, 2020; Allen & Walter, 2016). Our initial hypothesis was that higher levels of Extroversion would be, in general, a significant predictor of lower levels of body dissatisfaction. However, the only factor for which Extroversion was a significant predictor for both men and women was "Satisfaction and external parts". This may be associated with the fact that this factor essentially refers to externally visible parts of the body, such as the face and hair, for example. Since Extroversion relates to how people interact with others, in terms of the quantity and intensity of interpersonal interactions, it is possible that it plays a more relevant role in assessing bodily attributes that are potentially exposed in relation to internal aspects (Allen & Walter, 2016; Steel et al., 2008). For women, higher levels of Extroversion predicted higher levels of satisfaction related to external parts, in accordance with meta-analitical studies (Allen & Robson, 2020; Allen & Walter, 2016).

For men, in contrast, higher levels of Extroversion predicted lower levels of satisfaction related to external parts. This result is not in consonance with the literature (Allen & Robson, 2020; Allen & Walter, 2016). For further comprehending this result, models based on the interaction between the predictor variables are suggested.

Regarding women, for the factor Satisfaction and Lower Parts, Neuroticism (-0.23), BMI (-0.34), and Internalization (-0.35) were the significant predictor variables. In this same factor, only the BMI (-0.17) and internalization (-0.17) were significant for the men. The importance of lower levels of BMI in the prediction of higher levels of satisfaction with the lower parts can be explained by the fact that this factor's items refer to the glutes, flaccidity, hip size, and cellulite attributes intrinsically linked with body fat distribution.

Another point to consider is the role of Conscientiousness in the prediction of satisfaction related to body fat and musculature in men. Lower levels of Conscientiousness significantly predicted higher levels of Satisfaction and Muscle (-0.22), together with lower levels of BMI (-0.36) and Internalization (-0.27). These results corroborate a more negative facet of Conscientiousness on body image; in other words, adopting social patterns and following rules (Allen & Walter, 2016). Thus, interacting with the internalization of male body patterns and other individual and contextual variables, this personality trait can contribute to greater body dissatisfaction (Allen & Walter, 2016; Sutin & Terracciano, 2016). For women, however, Conscientiousness was not a significant predictor variable, which requires further in-depth investigation into the relationship between this trait and body dissatisfaction.

Finally, as observed in other studies (Andrew et al., 2016; Rodgers et al., 2014, 2018), a model that integrates biopsychosocial variables has proved to be useful for a better understanding of the predictive variables of different aspects of body dissatisfaction. However, for a broader comprehension of the relationships between the variables predictive of body satisfaction or dissatisfaction and differences between men and women, other types of more robust statistical analyses are suggested, such as the use of modeling of structural equations with moderation and mediation models.

Final considerations

The present study aimed to identify variables predictive of different aspects of body dissatisfaction in men and women in Brazil. It presents some strong points. It is one of the first studies in the Brazilian context that researchers were aware of that sought to investigate biopsychosocial variables as predictors of dissatisfaction with different bodily attributes. Other strengths were the inclusion of men and women in the sample and a distinct evaluation of the predictor variables for men and women, and the use of an appropriate measurement instrument.

The study presented the following limitations: the low heterogeneity of the sample in terms of socioeconomic status since most of the participants had high levels of education and relatively high levels of income, impairing its representativeness when compared to the Brazilian population, and the low heterogeneity of the sample in terms of age since most of the participants were between 19 and 38 years. Future studies could include elderly groups. Another limitation related to the ESSC is the non-satisfactory psychometric indices in the present study. For this reason, new validation studies and refinement of the ESSC are suggested (Hirata & Pilati, 2010). One more limitation of the study was the measurement of variables associated with the social context. For example, there was no measurement of the influence of other variables that may be relevant predictors of body dissatisfaction, such as the influence of "fat talk" (Mills & Fuller-Tyszkiewicz, 2016). Other ways of measuring socioeconomic status could also be incorporated.

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